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Thesis for the Degree of Doctor of Philosophy

The role of motivation in the disconnect between learned and applied spelling in written work with Grade 4 boys

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THE ROLE OF MOTIVATION IN THE DISCONNECT BETWEEN LEARNED AND APPLIED SPELLING IN WRITTEN WORK WITH GRADE 4 BOYS

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A thesis submitted to the
Wits School of Education
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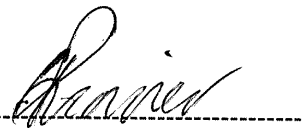
ABSTRACT

This doctoral thesis investigates the effect that motivation has on Grade 4 boys' learned and applied spelling, and how the difficulties the boys' experience influence their conscious choice of words when engaging with written tasks. The thesis has three conceptual bases: it draws on Piaget (1981) and Vygotsky (1978) to understand the different ways in which knowledge can be constructed. It draws on Gathercole and Alloway (2011), and Henry (2012) for a deeper understanding of the functioning of working memory. And it draws on the Unified Learning Model (ULM) (Shell *et al*, 2010), to position motivation within the learning process, and the effects motivation has on attention and working memory.

Data was collected through interviews conducted with 18 Grade 4 boys. The boys were selected as a purposive sample: the researcher had given academic support to this group of boys for spelling and English the year before; the group is, academically, a mixed-ability group; 5 of the 18 boys had a clinical diagnosis of a learning impairment such as anxiety, ADD, ordyslexia an inability to process information quickly enough so as to make learning and recalling information easier; 5 boys were second language English users; all the boys in the group experienced difficulties with learning and applying spelling. The finding indicates that motivation, or the lack thereof, has a significant effect on the boys' abilities to learn, conserve and apply their knowledge of spelling to written tasks. Because the boys do not have consolidated prior knowledge of spelling, the boys consciously choose simpler, easier-to-spell words when writing a creative paragraph where marks are deducted for spelling errors. The ULM offers a clearer understanding, on a neurobiological level, of the role motivation plays in these word choices.

DECLARATION

I declare that this thesis is my own unaided work. It is being submitted for the degree of Doctor of Philosophy at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



Caroline Rimmer
March 2022

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CHAPTER 1: An Inquiry into the Disconnect between Learned and Applied Spelling

This chapter explains the background to the problem investigated in the study. It will also outline the purpose of the inquiry, and the research questions that have arisen which the study hoped to answer.

The Background to Problem

Many teachers have asked me the same question - if a student can spell words in a spelling test, where only the word is given, why can they not apply this same knowledge to the dictation sentence or to writing in general? In my role as a learning support teacher, this question has been a driving force behind trying to assist students of all ages to improve their spelling. This research study has helped me gain a deeper insight into what motivates, or demotivates, the participants to learn, conserve and apply their spelling knowledge. The data collected helped me gain a new knowledge and understanding of the role motivation plays with regards to its connections between attention, working memory and prior knowledge.

For the last eight years, I have worked in a private, all-boys' primary school in Johannesburg, with the boys who struggle with aspects of reading, writing, spelling and Maths. As the academic support teacher, one of my responsibilities is to work out where, and possibly why, the boys struggle. I then devised activities, strategies or programmes whereby the boys could practise the skills that would help them. Critical to this process, is creating an environment where the boys feel safe enough to come to terms with their areas of weakness without seeing them as being definitive, to discover their areas of strengths, and to use these strengths to help them overcome their areas of difficulty. This feeling of trust would help develop the confidence to try (and possibly fail at) different strategies.

The interventions are a team effort - I work closely with the teachers, the parents and the boys. The small groups give me opportunities to work closely with, and observe, each boy. For the last three years, I have dealt only with the Grade 3 and Grade 4 boys. Over this time, the numbers of boys who needed support became too great for only one person. The school's department has grown from one teacher to three, one of which is part time. My focus is now

on the Grade 3's for reading, spelling and Maths, and the Grade 4 boys for reading and comprehension only, as the school felt it was critical to make sure the skills were consolidated at this young age. The older boys, together with the Grade 4 boys in need of Maths help, are supported by the other two teachers.

From 2011 to 2016, I took the boys out of class for the support sessions, but in 2017 I started to go into the classroom to provide remediation for the boys, as the school management felt this strategy would be more beneficial to the boys. I now see the boys in two different situations - in class during a lesson and out of class in a small group.

My focus in this study was on applied spelling as, over the years, I have noticed a growing number of boys who seemed to be experiencing difficulties around learning and applying English spelling. In this study, I looked at Grade 4, as these were the boys I worked with. I also fell it is the right age to study because the older they get, it seems the less interested they become in putting effort into their applied spelling. I have found the older boys (between the ages of 11 and 13 years old) are no longer interested in working on their applied spelling. It seems to be the case that the boys begin to believe themselves to be poor spellers, and they seems to start identifying themselves as poor spellers. The parents' and the school's positions are that they can apply for spelling concessions closer to their Matric year, while they could enjoy informal concessions now. These informal concessions could be in the form of a maximum of 5% taken off their final mark for the test or assignment, or it could be a great deal of tolerance on the teacher's part, as long as the words are decipherable. Other informal concessions could include the use of an electronic device such as a computer or the use of an electronic dictionary. Whatever the current course of action for these boys was, the underlying cause of the spelling problem does not seem to have been addressed effectively.

With the younger boys (aged between 9 and 10 years old), the problem was similar. However, they were still willing to try and apply their spelling. For a while, I motivated them with small rewards, such as earning special time with the principal of the school or earning a knitted square to make a blanket to donate to charity, worked for achieving set goals. The marks improved for the weekly tests, but spelling was still not being applied consistently.

When the current group of older boys were in Grade 3, they were just as keen to try and apply their spelling. However, as they got into Grade 4, where marks for spelling are introduced for

the first time, this willingness to try seemed to fade. I noticed that as they continued to get poor marks for spelling tests, and to get marks deducted from their English assessments for incorrectly transcribed spelling, this group of boys seemed to give up on even trying to spell well. With many of the boys, I noticed that their inability to spell correctly and consistently also seemed to affect their reading comprehension abilities. Many boys continued to struggle to decode unfamiliar words in text, which often caused them to misunderstand the meaning of the passage. Poor marks in English seemed to be a self-fulfilling prophecy with these boys. For example, one boy spelled the same word three different ways throughout his assessment, even though the word was in the text, and only when it was pointed out to him, could he see his errors.

Although the current younger boys, in general, are competent readers, and their decoding of unfamiliar words is age-appropriate, their ability to apply their learned spelling to sentences (such as in dictation) or creative writing, remained an area of concern. Many boys can spell the word when it is *only* the word, but when they need to write it in dictation (which is done directly underneath the spelling words) the word is incorrectly spelled.

I wondered if this was a problem of an *inability* to learn spelling, or one of *attitude* towards spelling? Are they linked in some way? Can one be affecting the other? I decided I wanted to understand this phenomenon better, so I embarked on a sustained journey to find out more.

Physiological aspects of learning

Before looking at what could be going wrong with learning or applying spelling, my first step was to rule out any physical inability to hear the sounds. Should this all be in order, my next step was to find out if there were any problems with the auditory processing process. This is the ability to make sense of what the ears hear - taking in the sounds of language through the ears and having it interpreted in the language part of the brain. A delay in interpreting the sounds can happen even if hearing is normal. A noisy classroom environment, the content of the subject and competition for the brain's attention can all affect how the information can be interpreted, and the information can become jumbled, confused and, therefore, misunderstood.

Should both the ability to hear well and the auditory processing be normal, it was then important to establish whether there were any problems with the student's phonemic awareness. Language is made up of individual sounds, or phonemes, which are the building

blocks of words. Every language has a different number of phonemes, and English has 44. Although English has only 26 letters, it has combinations of letters that can make up a single phoneme. Even if hearing and auditory processing are normal, there could be problems at the phonemic level that would interfere with the ability to spell. These phonemic awareness skills are critical not only for spelling, but also for reading. Included in this set of skills is the ability to recognise the sound-letter relationship and how the letter is represented as a written sign (grapheme).

Closely related to these sets of skills is phonological awareness - the ability to identify and manipulate the sounds in words and see the onsets (the beginning sound of a word), rimes (the end sound of a word) and patterns of the phonemes. Students with poor phonemic and phonological awareness are at risk of developing '… serious delays in reading, spelling and writing (Levine, 2002, p 131).

The time it takes for the brain to make sense of the incoming information and to then respond to it, either by recognising what it is or by formulating a verbal or written response, is known as the processing speed. For students who have a relatively slow processing speed, recognising the sounds and shapes of letters fast enough to be able to read or spell fluently could be extremely difficult. This, too, could add to the problems these students experience with spelling. Up until, and including, the DSM-4[1], the term 'dyslexia' was given to the inability to process information quickly enough. Children diagnosed with dyslexia may exhibit symptoms such as slow, often inaccurate and effortful reading, poor written expression, or possibly difficulty with retrieving information quickly enough. The DSMV-5, however, has included dyslexia into the more general term of Specific Learning Disorders (The American Psychiatric Association, 2013). Here, I am acknowledging that the DSM-5 no longer sees dyslexia as a diagnosis on its own.

A psycho-educational report done by an educational psychologist can often pick up areas of weakness or concern in the processing speed, the phonemic awareness and the phonological awareness of the student. Many of the boys I have dealt with over the years have had such assessments done, and their reports have indicated they have problems in one or more of these

[1] The DSM is the *Diagnostic and Statistical Manual of Mental Disorders* - an internationally recognised manual of mental disorders used by clinicians to diagnose children with learning difficulties. The DSM-5 is the latest edition of this manual.

areas. In the course of this study, should the boy have had such an assessment done, and should permission be granted to use it, I will take the results of the report into account when interpreting the data collected for the boy. However, many of the students who did have psycho-educational assessments done did not have any problems in these areas. Both their phonemic and phonological awareness were age-appropriate, as was their processing speed. This indicates that they have good prior knowledge of how the letters and sounds work together to create words, and that words are brought together to create a sentence. So what else could be causing the disconnect between their learned spelling and their ability to apply their knowledge?

Attention to the task

When consulting with the teachers, many mentioned that a common trait amongst the boys who experienced difficulty with spelling was that they struggled to pay attention in class. This was evident in the way the boys did not, or could not, follow instructions, or that they could not keep up a sustained focus long enough to complete the task. Paying attention to a task is the first, crucial step to building knowledge. A lack of attention could result in no learning taking place, or incomplete learning happening. I am sure we are all aware of sitting in a lecture when there is a noise or disturbance outside which distracts us momentarily. We lose the gist of what the speaker is saying and spend the next a few minutes trying to make meaning of what is said. Within those few moments, we may have lost a critical fact. This is how it is with students in the classroom. Often, students presenting with a poor attention span are diagnosed with having Attention Deficit Disorder (ADD)[2]. According to the Diagnostic Statistical Manual of Mental Disorders, version five (DSM-5), ADD is defined as a neurodevelopmental disorder, and is '...a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by...' inattention or hyperactivity / impulsivity, that goes beyond the normal behaviour of children or adults (Reynolds and Kamphaus, 2013). It could either take the form of agitated hyperactivity, or it could be that the student is hypoactive - he daydreams and finds it hard to keep focused on a task as his thoughts take him on many different paths. However, Levine (2002), has suggested that some children are misdiagnosed. He argues that there are three different categories of attention controls, each

[2] Attention Deficit Disorder, a disorder that affects the chemical transmitters that transfer the electric pulse between neurons in the brain.

with their own specific neurodevelopmental functions (Levine, 2002, p 58), and the ability to pay attention for any period of time is only *one* of them. Children who present with attention difficulties may experience difficulty with any combination of these functions and may not have a neurodevelopmental disorder at all. Some of the boys in my classes have been diagnosed with ADD and are on the appropriate medication. However, some students within this particular sub-group still struggled with focusing their attention. I tried applying Levine's concepts of attention controls (Levine, 2002, p 57) to all the boys I taught, and I found, through observation and questioning, that many boys seemed to struggle mainly with the controls associated with mental effort (how hard the task is perceived to be), mind activity (*anything* was better than doing this task!), previewing (the ability to see what needs to be done and how to do it) and reinforcement controls (the ability to see what works and what doesn't, and to learn from mistakes). I had some measure of success in isolating some of these problem areas and showing the boys some simple strategies to use to help them cope, but overall, the ability to apply their spelling did not improve significantly.

Working memory

Another aspect of learning linked to the inability to focus or to follow instructions is the functioning of the student's working memory. Alloway (2011) argues that working memory '...is a better predictor of academic success than IQ because it measures a student's potential to learn, not what they have already learned' (p 15). The ability to pay attention to the task is critical for the efficient functioning of working memory. Working memory is '... the place where the multiple intentions or components of any activity are held in place long enough to complete that activity' (Levine, 2002, p100). As I understood it at the time (and I will expand on this later as my understanding of working memory has developed further), working memory's function is to hold all the elements of a task together in a temporary storage space until either the task was done, or a product was produced (such as an answer to a teacher's question, a piece of writing, or a result of a problem that could then be used to solve the next problem). Working memory links prior knowledge with the new information, manipulates it, then produces a result. This sequence of events would help create knowledge in long term memory, which in turn becomes prior knowledge, to be drawn on at future time. Yet, as working memory is temporary, any interruption to the thinking process could lead to the loss of the train of thought during the task. It would be the same as walking to the kitchen to get a cup of water, but because you are so preoccupied with another problem, by the time you get to

the kitchen, you have forgotten what you were there for! Any lapse in focus in the classroom setting could have the same results for a young student learning spelling.

Working memory has a limited capacity (Henry, 2012, p2), which means it cannot be overloaded with information. The implications of this for applying learned spelling are important. If all the student must do is to spell the word, it does not take up much working memory space, and so is do-able. However, writing is a particularly difficult and complex task. The student has to remember many things other than just the spelling of a word. They have to remember how to hold the pencil, the correct punctuation, letter formation, and good grammar, all the while keeping in mind the meaning and context of the sentence. Although many of these actions and skills have already been learned by the age of 9 years old, some of them may not yet be as automatic as they should be. This means working memory must still pay them some attention. As a result, in the effort to get their thoughts down on paper, paying attention to the correct spelling often gets forgotten. In looking more closely at working memory, I wondered if its function could also play an important part in learning to spell. If all the previously mentioned abilities (hearing, vision, phonemic awareness, phonological awareness, attention) were normal or age-appropriate, but the student was still experiencing difficulties with learning and applying spelling, I began to wonder if the problem of applied spelling could lie with working memory.

At that point in my journey of understanding the disconnect between learned and applied spelling, my strategy for remedial intervention was to use the psycho-educational report (should there be one) to find out if there were any difficulties in the areas of auditory or visual processing; phonological awareness; the ability to apply sustained attention on a task for the required length of time; or working memory functioning. I would structure the activities around strengthening these areas. I also began to talk to the boys about the different aspects of learning, such as the quality of their knowledge, their ability to pay attention and the role of working memory. My goal in doing this was to emphasise to the boys that the way in which their brains were wired, was out of their control, but that what *was* in their control was to find strategies to help their learning. I was apprehensive at first, as I was unsure how much these 9- and 10-year old boys would understand, or even care about, but in most cases I was very pleasantly surprised. The activities took on a deeper meaning as at each part, the boys could identify if they needed to apply attention (perhaps because they found it really hard to start a task), or perhaps link the new information to what they already knew (asking the question ‘Where have

I seen this before?') or realising they needed to write something down so that they could free up working memory 'space"' to think more.

Attitude

Some of the young boys I taught certainly did have difficulties with some of the areas mentioned above. They had to exert a great deal of effort, not only in learning the spelling, but also in remembering how to apply it. However, other students seemed to have good prior knowledge of phonemes and how the English language worked. They did not appear to have any problems with their processing speed - the psycho-educational reports indicated this was age-appropriate, as was their working memory functioning. So, if their *prior knowledge* was good, their ability to pay *attention* (Levine, 2002; DSM-5) was good and their *working memory* (Alloway, 2011; Henry, 2012) was functioning within age-appropriate levels, what else could be interfering with their ability to apply their knowledge of spelling?

During conversations between myself and the boys about the different aspects of learning and what could be done about them, all the boys, without exception, mentioned how hard it was to achieve any measure of success in spelling. With this in mind, I started observing the boys I taught and their attitudes (or thoughts) about spelling. I noticed how the boys took a long time to settle and then rushed through the activities I set for them. They seemed to find spelling particularly difficult, and so were reluctant to even start the activities (one of Dr Mel Levine's mental effort controls). The boys did not seem to really care about accurate spelling, especially as the term progressed and they continued to fail to get the marks in spelling they wanted. I also noticed that their creative writing started to regress a little. Verbally, most of the boys were extremely strong and could use vocabulary above that expected for their age group. However, when writing, they would rather choose simple words they knew how to spell than to experiment with more interesting, more challenging words (words they used in their own conversations) as they were fearful of losing marks for incorrect spelling. The ability to spell was now affecting other areas of learning for these boys. As they began to learn subject-specific vocabulary - such as in Geography or Maths - their inability to learn spelling was exacerbated. Failure seemed to lead to more failure.

Up to this point, I realised I had only focused on the physical attributes of learning - visual or auditory processing; processing speed; the quality of prior knowledge; the ability to pay

attention; and the functioning of working memory. While all these aspects of learning are vital to effective learning, there was still something missing. It was during my conversations with the boys about how they felt about spelling (and sometimes learning in general) that I began to realise the importance of *attitude* in the learning process. Even if the lesson was interesting, even if the boys were focused and engaged during their support lesson, even if the rewards were worth working for, all that positive action stopped when they walked out my door. I, the teachers and the parents, noticed that the effort and enthusiasm the boys put into activities in their support lessons was not transferring to the classroom or homework situations.

I began to wonder if attitude towards spelling could be a bigger influencing factor than any of the previously-mentioned physical factors in the ability to apply learned spelling?

I then started an investigation into what Dweck had to say about mindset (or attitude) and how that can affect how we tackle difficult tasks. For these boys, remembering how to apply spelling *was* difficult. Dweck (2012) describes 'mindset' as the '...view you adopt for yourself…' (p 6) and goes on to say it '...profoundly affects the way you lead your life' (p 6). For me, this highlighted the idea that your thoughts about something could affect your attitude towards it, and therefore would affect how much effort you would put into something you found difficult. Could a student's mindset about school, learning in general and spelling specifically affect their spelling? Dweck suggests that 'believing that your qualities are carved in stone - the *fixed mindset* - creates an urgency to prove yourself over and over' (Dweck, 2012, p 6). A fixed mindset creates acceptance for one's talents and basic qualities. So, students who experience repeated failure around spelling begin to believe they are poor spellers, that they cannot do anything about it and so feel the effort is not worth it. On the other hand, the '...growth mindset is based on the belief that your basic qualities are things you can cultivate through your efforts' (*ibid,* p 60).

This made me wonder whether the boys had already labelled themselves 'poor spellers' and, because they find it really difficult, motivation to spell well is not very high. Could the fixed belief of being a poor speller be changed to a mindset which believes that, with effort and perseverance, the ability to spell can improve? I also realised that the boys' attitudes towards spelling were not the only ones in the mix. How did I, as their teacher, convey my thought and feelings around spelling? How did their parents, their teachers? The modelling of beliefs and attitudes towards spelling from the significant adults in their lives could also affect how the

boys felt about spelling - not only its importance in everyday life, but also around the effort needed to use it accurately.

Bringing together my understanding of the attention controls (Levine, 2002; DSM-5), working memory (Alloway, 2011 and Henry, 2012), mindset and resilience (Dweck, 2012), I understood that I needed to develop activities I thought the boys would find novel enough to pique an interest in spelling, to set achievable goals, and have meaningful rewards for which to work. I understood that the activities needed to include opportunities for the boys to identify where their respective attention difficulties / working memory difficulties / gaps in their prior knowledge lay so that they were able to develop strategies specific to them. It was also important for the boys to have a safe space where they felt these difficulties were not judged, and where they felt confident to try new ideas, in spite of the possibility of failure. Building trust was critical for a change in mindset to happen. By me being open and honest about topics like poor attention (particularly about being on medication - many of the boys I teach feel it is a stigma), poor working memory and not having the prior knowledge expected of this age group, went a long way in achieving this sense of trust. The spelling activities were based on the school's spelling programme, and so I used the weekly words as examples with which to work. Each activity was carefully chosen so it would access prior knowledge; it would appeal to the boys' areas of interests; it would be competitive; it would be different, all the while providing practise in spelling, reading, writing and manipulating the words. Needless to say, my enthusiasm far exceeded theirs! Although the boys seemed to enjoy the activities, their skills at applying their spelling was not improving. Something was still missing.

While trying to find ways in which to break the cycle of negative thinking and emotions around spelling, I came across an approach to changing one's life through talking about problems developed by Ratner, George and Iveson (2012). Solution Focused Brief Therapy (or SFBT) helps 'people to build change in their lives in the shortest possible time' (*ibid,* p 3). This form of therapy is based on the principle that change comes from two main sources: imagining what the situation would be like if a magic wand was waved (a *preferred future* (*ibid* p 3)); and identifying *instances of success* (*ibid* p 3) in the present and in the past. It involved goal setting, a knowledge of where they were at the present and an idea as to how much effort will be needed to get to where they wanted to be. It identifies strengths and the ability to see where these strengths could be used to help improve the areas they found hard. Although the students tried hard to do this, in the long run, it was not a successful activity. One of the reasons could be that

the boys were too young to do such a visualisation. It could also have been that I was not proficient enough in the routine to guide them effectively.

Motivation

Over the time I taught the boys, I found they became less and less enthusiastic about spelling. Although some boys did experience more success with their learned spelling, this knowledge was not being transferred to their sentences or creative writing. It was when I began to reflect with more purpose and intensity on what was happening with spelling that I began to see a common thread. It seemed most of the boys had experienced repeated failure around spelling from an early age. Many had attention difficulties, perhaps because they found spelling so hard (Levine, 2002). Many believed it was acceptable not to be able to spell, because if they just waited long enough, they would have Spell Check at their disposal. Many boys had parents who were also 'poor spellers' and did not place too much emphasis on spelling ability. Other boys had parents who were so obsessed with their spelling marks, that the pressure to succeed at spelling was relentless. A few boys have told me over the years that they were afraid to get good marks in case they had to keep it up every week. All these reasons seemed to come down to three things - past experience, negative emotions around spelling and a lack of motivation to keep trying.

In order to better understand how to assist these boys with their spelling, I realised I needed to have a much deeper understanding of their emotions and attitudes towards learning to spell as these seemed to drive their motivation to either tackle tough tasks, or to keep on trying to apply their spelling knowledge. Whether they had problems with their processing speed, the quality of their prior knowledge, their ability to pay attention or issues with their working memory functioning, or even if all these attributes were working effectively according to their stages of development, every boy thought spelling was hard work. Every boy found it really difficult to motivate themselves to try hard or to try different strategies - after all, why must they put the effort in if they are not going to get the results? Understanding motivation became paramount to understanding the possible link between learned and applied spelling. Raise the motivation, and it could be possible to raise the energy levels needed to tackle difficult tasks.

The Purpose Statement

The purpose of this study is to understand what role motivation plays in a specific problem, namely the problem of the disconnect between learned and applied spelling in a group of Grade 4 boys.

The Rationale

'We were never born to read. … Reading is one of the single most remarkable inventions in history.' (Wolf, 2007, p 3). At its very basic level, reading can be thought of as the ability to decode written symbols in order to make meaning from them. Diane Henry Leipzig of *Reading Rockets*, a reading programme, explains it further: "Reading is a multifaceted process involving word recognition, comprehension, fluency, and motivation" (2001). One of the key skills to achieve fluent reading is the ability to decode these symbols quickly and efficiently in order to recognise the words. The speed and efficiency with which this is done will influence how well the reader comprehends what they are reading. To do this, the reader needs a solid knowledge of the letter-sound connection, so they may be able to build words (spelling) and to break words down into their components in order to read unfamiliar words or to glean meaning from a word he has not yet come across (decoding). In addition to these skills, the reader needs to have a deeper knowledge of English to understand the meaning of unfamiliar words given their roots, and to infer meaning when no specific words are given (reading "between the lines"). English is an extremely difficult language in which to learn to read and write - it has 26 basic letters, 44 different sounds and 250 ways of spelling those sounds.

The ability to spell properly is still a valuable skill, despite the kinds of spelling our young children are exposed to on a daily basis (for example, the abbreviated text spelling, the autocorrect option on smart phones, and the Spell Check on computers). It is one of the skills many employers look for in potential employees, and these potential employees can be prematurely (and perhaps inaccurately) judged on this skill. Lennox Morrison (2017) says in a report for BBC Capital "poor spelling can also create confusion, a loss of clarity and meaning, and, in extreme cases, it can cost millions in missed sales and job opportunities" (Lennox Morrison, 2017). In my own daily practice, I tell my students that spelling is all about manners. If you are asking someone to read something you have written, be it a letter or a note or even

an essay, you owe them the courtesy of not having to work hard to understand what you have written - you want them to focus on the content, the message.

However, for some young students, spelling correctly is hard work in itself. I have found that many boys I teach gave up after a while, as they were told that they could get spelling concessions in high school, or that they could use Spell Check when they can use devices to complete their work. I wonder whether, if young students understand the importance of proper spelling, if they can understand their own difficulties in this area, and if they can work out strategies that help them as an individual, they may be more motivated to keep on trying, rather than giving up?

This study has helped me understand just how important motivation is to learning to spell and to applying spelling knowledge. It has given me a new insight as to how motivation affects working memory's ability to function optimally in the spelling situation, together with motivation's role with regards to the ability to pay attention to the task and laying down or accessing prior knowledge. It has also highlighted motivation's role in the boys' choice of words when engaging with written tasks.

The Research Questions

In attempting to discover why some students can spell individual words, yet cannot apply this knowledge to other kinds of writing, the main question this study hopes to answer is:

What is the role of motivation in the disconnect between learned and applied spelling in all kinds of written work with Grade 4 boys?

To answer this question, the following sub questions need to be answered:

- What do different theorists say about learning in general, and the role of motivation in particular?
- How do Grade 4 boys feel about spelling and writing tasks?
- How do these boys react in response to spelling and writing tasks?

Conclusion

I have worked in an academic support role both in a private capacity and in a primary school for many years. The question of a lack of transfer between learned and applied spelling has been raised many, many times during that time. But the questions have not yet been satisfactorily answered. I have tried to find reasons for the phenomenon and have tried to teach many different strategies to help alleviate the anxiety around spelling. Some of these strategies have worked for some students, but not for others. While I understand that not all students learn in the same way, and therefore there is not a "one strategy suits all" solution, some students do not improve their spelling abilities using one, or any combination, of the strategies. There has seemed to be no consistency in the results. When talking to the students about the thinking behind their spelling errors, it became evident to me that there was more to this disconnect between learned and applied spelling than simply not having the correct knowledge. Attitude and beliefs about personal abilities, and the perception of possible success or failure around spelling tests and writing, seemed to be more and more prevalent.

By exploring the perceptions of and motivations for spelling among Grade 4 boys to their applied spelling, I hoped to understand more deeply the relationship between motivation and emotion around spelling, and how motivation affects attention in learning. I hope to find out what it means for these students who know they can spell, yet struggle to apply their knowledge. In other words, what it means to have the knowledge but be able to use it.

CHAPTER 2: How learning happens

In this chapter, I will look at the processes involved in learning by reviewing 2 of the leading existing theories of learning. As motivation is the key concept of this study, I will review how it affects these processes in more detail in Chapter 4.

In the literature concerned with the learning process, I have found *attention*, *memory* and *knowledge* to be common concepts. The concept of "attention" has had various names (focused attention, voluntary attention to name two). The term "memory" has changed over the last few decades in what it encompasses and its role in the learning process, but all theories agree that it is affected by the ability to pay attention to the stimulus. In the context of the classroom, knowledge can be defined by as "facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject" (online Oxford English Dictionary). This will be the definition I refer to throughout this section.

Most models of learning (such as Piaget's cognitive development theory, Vygotsky's socio-cultural theory and Naglieri and Das's PASS theory of learning) agree that in order to learn new knowledge a student needs to pay *attention* to the task; they need to call on *past knowledge* or experience; they need to incorporate the new information into *memory*; and, finally, to *apply* it new situations. Each theorist acknowledges the role motivation plays in learning. Piaget calls it "affect", and this term incorporates "motivation" in its broad term.

Piaget

The role of attention in learning

Jean Piaget's theory of cognitive development has had a huge influence on the way teachers have viewed teaching and learning. Piaget developed a theory of development based on four linear stages. Each biological stage is characterised by specific behavioural and cognitive achievements. These stages are as follows:

- Sensorimotor stage (birth - 18 months)
- Preoperational stage (18 months - 7 years old)
- Concrete Operational stage (7 years old - 11 / 12 years old)
- Formal Operational stage (12 years old - adulthood)

For the purposes of this literature review, I will focus mainly on the third stage (Concrete Operational) as this is the stage into which, according to Piaget, the boys I teach fall. However, I will also consider the previous stage of development as the foundations of cognitive development that affect the third stage begin in the second stage. It must be noted here that Piaget did not suggest absolute ages for each stage of development, but rather a typical age range (Furth, 1969, p 17). However, teachers and others involved in education have tended to take the age ranges more literally. Hence, it is a common expectation, for example, that all Grade 4 students should be able to achieve the same levels of skills and competencies around the same time. This is not what Piaget proposed. Although he stipulated that the sequence of the stages was set, he suggested that the ages were only typical, not determinants, of the stages. Piaget argued that the end of each stage sets the baseline for the next. Applying that to my research situation, it may be then, that some of the boys in the age group I teach may still need more concrete instruction and practise and may not yet have made the leap to using the more abstract skills of reflection, and are thus not yet be able to learn how to edit their work independently.

The Concrete Operational stage is characterised by the start of logical thought. This means that children in this developmental stage are starting to use language and their own knowledge to solve problems. They are beginning to think logically about concrete activities, but still struggle to understand abstract concepts (McLeod, 2015). Children at this stage of development are also becoming aware of the reversibility of things. This is the ability to reverse the relationship between mental images. For example, a child will link the concepts of "woman", "nurse" and "mother" so that they will understand that a nurse is a woman, their mother is a nurse and a woman. With regards to spelling, they will start to understand that the word can signify meaning, and that by understanding the meaning, they can find the word.

Piaget suggests that knowledge is constructed by the child through the various interactions and experiences they have with their environment (Furth, 1969, p 7). Children learn by playing or by interacting with their environment. Piaget places importance on the role of focused attention (Eysenck, 1993) in this interactive learning process. Piaget argues that the child has to be an active, as opposed to a passive, participant in their learning (McLeod, 2015). This implies paying focused attention to their activity. As the child grows and develops, they will construct their knowledge base, which is made up of knowledge chunks. Piaget calls these knowledge

chunks “schema”. Piaget stated that any living organism strives for equilibrium to achieve a balanced state of being (Furth, 1969). Piaget’s research demonstrated how for children, equilibrium occurs when new information is dealt with by holding it up against their pre-existing schema of knowledge, which then leads to the children either *assimilating* it (absorbing it into that scheme of knowledge) or going through a process of *accommodation* (replacing or changing a scheme that no longer works for them). The result of either process is *equilibration*, a state of balance. Both processes add to the child’s knowledge scheme and make it deeper and more complex each time. Cognition develops organically (Furth, 1969, p 5). The state of disequilibrium results in frustration for the child, and a need to take action in order to rectify that feeling. Equilibration is “...the force which drives the learning process…” and the child will “...seek to restore balance by mastering the new challenge…” (McLeod, 2015). Piaget suggests that “every scheme has an assimilative and accommodative activity”, yet not every accommodation will result in a new structure or scheme (Furth, 1969, p 229). All three processes (assimilation, accommodation and equilibration) require attention. But Piaget’s work focussed more on the *processes* rather than the *attention* needed to reach equilibrium. If a child is interested in the activity, if they are seeking to assimilate or accommodate the new information to reach a new state of equilibrium, they will automatically be paying attention.

However, for Piaget, learning to spell does not seem to develop organically, as mentioned in the previous paragraph. Spelling cannot be learned through play or by simply engaging with spelling - it has to be explicitly taught. According to Piaget’s developmental stages, towards the end of the Preoperational stage (ages eighteen months - seven years old) most first language English speaking children start to learn to spell. By the time they are in the next stage, the Concrete Operational stage, the students are learning to spell to produce original, written work. Piaget does not believe that the ability to spell can develop organically, as language, for example, does. He argues that it is a “partial ability” as it needs an “exterior contribution” (such as explicit tuition and practise) in order to develop (Furth, 1969, p 210). For example, a child learning a new sound-letter combination for the same sound (for example, long /o/ can be spelled /o_e/; /oa/; /ow/) could check the word against what they already know. If the spelling is not the same as they remember it, or if the spelling of the sound is not familiar, they could go through the process of accommodation (holding the new information up against what they already know), but no equilibrium can be achieved on their own – they need someone else to explicitly teach the new combination to them. They could draw on the letter-sound combination they do already know, but without the explicit teaching of the new combination, they will be

unable to reconcile the new way of spelling the same sound and thus cannot internalise it. So, the scheme does not change, and the new way of spelling the same sound is not remembered. This means they will not be able to apply their knowledge the next time they sees this word, or have to write it in a different context, such as in a sentence the next day or the following week.

Piaget acknowledges the role of attention in learning and argues that it will be affected by how motivated the child is to engage with the activity. If a child is not engaged and paying attention, or if they find the activity too difficult, they will not pursue the activity any longer and no further learning will happen at that time.

Memory

Piaget deals with memory in the same way as he does with attention - in a general understanding of how it develops and its relationship with intellectual development. As with biological and intellectual development, Piaget suggests that memory also develops in stages. The difference, however, is that he feels it does not necessarily follow the strict sequences that characterise biological and intellectual development (Furth, 1969, p 161). Instead, Piaget suggests that the stages of memory can develop simultaneously and can also develop in uneven fits and starts. Although it is intricately linked to intelligence, memory does not follow the same developmental stages.

Piaget suggests there are two different kinds of memory related to knowledge (Furth 1969, p155). The first is the wide sense of memory. This is associated with the assimilation of new information into an internal schema of knowledge. The second is the strict sense of memory, which is related to how the information is accommodated in, and therefore changes, the schema of knowledge. This strict sense of memory requires '...detailed and differentiated accommodations…" (Furth, 1969, p 158). These knowledge schemata then link together to form networks of knowledge which can then be drawn on again in the future. Piaget also speaks of three levels of memory, each with specific functions (Furth 1969, p 158):

1. Recognitive memory: this would involve recognising the new information from an existing scheme of knowledge. With regard to the act of spelling, this could relate to word recognition, and all the information attached to that word, such as different meanings, different connections etc.

2. Reconstructive memory: this kind of memory is based on imitation. In the case of spelling, it could be the ability to remember how the word looks when spelled correctly. This could explain why a child might spell a word incorrectly all the time - the image of the incorrect spelling is a more powerful image than the image of the word spelled correctly (for example "whith" for "with"). It could also be linked to imitating the attitudes and beliefs around spelling of the significant adults in the child's life - whether spelling is valued or not.
3. Evocative memory: this is the ability to recall an experience or event. This involves mental imagery, language and emotions. In the case of spelling, the child would need to recall the sound and shape of the word; the names, sounds and shape of the letters and letter combinations of the word; as well as having to recall how to write them, hold the pencil, and to space and sequence the letters and words (amongst other skills). They would also remember the feelings of, for example, frustration, failure or success.

Piaget views these networks of schemata in the same way other theorists would view long term memory or knowledge. According to the Unified Learning Model (to be reviewed in Chapter 4), Piaget's three functions of memory are incorporated into the concept of the functions 'working memory'. (Shell *et al,* 2010). When first encountering a new stimulus, the child would try to link it to these networks to see what they already know about it. If they know nothing, or if the stimulus is similar to something they do already know, assimilation will take place, and the new knowledge will be linked to the relevant schemata. If the new information is too different to what they remember, they will try to accommodate the new information, and possibly change or even reverse the knowledge contained in their existing set of schemata. We build up these networks in response to our environment, and call on them, or retrieve them, when we need to (McLeod, 2015). Once the child has accommodated the new information, they reach a state of equilibrium - a state of mental peace of mind. Their knowledge allows them to interact with their environment without any frustration.

Knowledge

For Piaget, learning and development are all about the stimulus-response relationship (Piaget, in the foreword to Furth, 1969, p vi). The stimulus is an external phenomenon, while the response is initiated internally. His notion of the child constructing their own knowledge through interacting with his environment illustrates how important it is for the child to be exposed to as many learning opportunities as possible. The more varied and richer the

experiences for the child, the more decisions they will have to make about the responses. Assimilating and accommodating new information to reach equilibration helps develop more concise knowledge and forms many links to the internal schema they have already constructed. This helps the child to access their stored knowledge in many different ways (Furth, 1969, p 7). Assimilation (the incorporating of new information into the already existing schema) is very subjective. A child tends to modify their experiences to fit into their own beliefs (Furth, 1969, p 13). A consequence of this is that we tend to associate both positive and negative emotions with the experience, and therefore attach these to our schema. An experience we have enjoyed will have positive emotions attached to the schema and so will be repeated. Should we experience anything negative such as failure, we might avoid repeating that experience in the future. However, Piaget argues that there is more to constructing knowledge than simply assimilating or accommodating new information. He states that learning is "...a result of constant self-reflection, self-regulation and self-expanding…" (Furth, 1969, p 65). This means that if the child enjoys what they are doing, they will be focused (self-regulating), be constantly linking what they are doing to their prior knowledge (self-reflection) and all the while assimilating and accommodating the new information into their schemata of knowledge (self-expanding). Piaget argues that the more engaging and varied the experiences of the child, the richer, deeper and wider the child's knowledge will be, the more strongly linked the schemata will be and the easier it will be for them to access knowledge and experience with which to react to (make decisions about) new experiences / stimuli.

Piaget focused on *general development*, rather than on the kind of learning that happens in the classroom. His theory is useful in understanding how the learning process happens in general, but I needed to know how it applied to the *individual.* Piaget helped me understand that the activities the boys needed at this particular stage of their development (Piaget's Concrete Operational Stage) needed to still be hands-on, interesting, topical to this age group and concrete in nature. Piaget's theory of how learning happens, and the processes involved (attention, memory and knowledge) helped me understand that linking new information to existing knowledge was crucial to creating larger chunks of knowledge from which the student could draw, and that practise helped strengthen these links. The boys in this study seemed to struggle to construct their own knowledge, as in many situations, the curriculum (the way in which the teaching of spelling was structured) did not suit these boys' academic needs and the pace of work did not allow them the time to do so. It was also assumed, that by the time the boys arrived in Grade 4, they already have knowledge of the basics needed for spelling. But, if

all the processes *were* functioning as they should, why was it that some boys could not apply their knowledge in different writing situations? Piaget suggests that it could be due to poor motivation to do so. This concept will be dealt with in more detail in Chapter 3.

Pulling together the threads of the main ideas of the learning process according to Piaget, the child needs to be interested in the task (which engages attention), they need time and opportunity to add to and expand their schemata of knowledge. They need to be able to reflect on the task, integrate what they have learned and finally be able to co-ordinate their schemata.

Vygotsky

The role of attention in learning

Lev Vygotsky suggested that "... learning was an active, social process independent of stages of development" (Semmar and Al-Thani, 2015). Like Piaget, Vygotsky believed learning happened through engagement with concrete and abstract activities, but Vygotsky placed more emphasis on the importance of learning in a social and cultural context and making meaning of one's environment (Vygotsky, 1978). Vygotsky did not agree that development happened in stages as Piaget did, but rather claimed that learning and cognitive thought developed with the use of language. As children become more competent with their language, they became more adept at solving the problems either by using their private language (their thoughts) or to think out loud (Vygotsky, 1978).

Vygotsky's theory has three main elements which are significant for classroom learning and teaching. The first is the zone of proximal development (ZPD) (Vygotsky, 1978, p 84). Vygotsky suggests that there are at least two developmental levels - the actual developmental level and the level of potential. The actual level of development is where the child is in terms of their mental functions at that time in their life. It signifies the level where they have completed previous developmental cycles (Vygotsky, 1978, p 85). In the classroom, this level would be the things the child can do on their own. However, Vygotsky believed children could achieve more with assistance from a teacher or someone else that had more knowledge. He calls this person a "more knowledgeable other". This person could be a teacher, a tester or even a peer. The zone of proximal development is described as being "...the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in

collaboration with more knowledgeable peers" (Vygotsky, 1978, p 86). In the classroom, this means that the teacher is an integral part of the child's learning experience. They fulfil this role by acknowledging what the child knows (prior knowledge) and then structuring the learning experience to best suit the child. The learning experience needs to take the child from what they know (actual level of development) to their level of potential with the least amount of frustration. Frustration could indicate that the ZPD has been initiated from a base above the developmental level of the child.

This could be what is happening in the classroom with spelling. The child may not yet have mastered the knowledge of phonemes or may not have consolidated the knowledge of the deeper levels of the language but is being asked to do an activity such as writing a sentence, which draws on both kinds of knowledge. With so much effort being spent trying to remember what they need to in order to achieve the task, they are then not able to achieve consistently accurate spelling. Frustration at not getting it right could set in, and learning is compromised.

The second important element of Vygotsky's theory is that of the teacher (parent or more knowledgeable other) structuring the task so as to lead the child from a lower base of knowledge to achieve a higher level of knowledge. (Vygotsky, 1978, p 88). In spelling, this would be the acquisition, for example, of the knowledge that a letter-sound combination can be spelled in different ways (the long 'a' sound can be spelled: 'ay'; 'eigh', 'ey' 'ai' a_e'. Wood, Bruno and Ross (1976) use the term 'scaffolding' to explain how a teacher or 'tutor' (*ibid)* can guide a child to achieve the desired end product using different methods. According to Vygotsky, this allows the teacher to model a thought process or a process of inquiry that then allows the child to attach the new information to their pre-existing knowledge. It is important that this scaffolding is presented at the correct level - that of the child's actual development. In spelling, the tools used to achieve this could, for example, be activities such as finding many different meanings and connections for the word, recalling the sound and spelling from previous tasks, finding examples of the spelling within other words, word searches using words containing the same spelling. This has serious implications in the classroom, as the teacher is required to know each child's actual level in order to guide them to their level of potential. As both Piaget and Vygotsky acknowledge, children develop at all different levels of mental and physical functioning, even within a specific age group, and it is extremely difficult to aim teaching at each and every individual level. Vygotsky then suggests that the "...*course* (my italics) of their learning would be different" (Vygotsky, 1978, p 86).

Perhaps they will need more help than the teacher can give in the classroom situation - they may need individualised attention, or another form of support such as academic support.

The third element of Vygotsky's theory that is important for classroom learning, is that of the use of tools. According to Vygotsky, humans use tools to problem solve and therefore enhance their learning (Vygotsky, 1978, p 20). Buhler (1930, cited in Vygotsky, 1978, p 21) called this "technical thinking" - that is, humans use tools to change the stimulus. These tools could take the form of physical items (such as wooden blocks), speech, language, strategies, or modelled thought processes. Each time a child is exposed to any of these tools, and shown how to use them, they build a scheme of knowledge (similar to Piaget's schema of knowledge) for future use which Shapiro and Gerke (1928, cited in Vygotsky, 1978, p 22) call models. These models become a "rough blueprint" for future responses and behaviours. Key to understanding Vygotsky's theory is that he argues that children develop cognitively and intellectually through the use of language - verbal and written (Vygotsky, 1978, p 23). Therefore, the more the young child is exposed to speech, language and printed word, the richer the pool of tools they can call on and use. In teaching spelling, the kinds of tools the teacher could use are things such as: breaking the word down into its sound chunks; linking the sound being taught to other words with the same sound; looking at the many different meanings a word (such as "jam") could have; and, of course, many opportunities to practise using the word.

So how does attention fit into this theory of learning? Piaget argues that a child will learn if they are interested in the task, and if there is not too much effort to assimilate and accommodate the new information. Vygotsky, on the other hand, argues that attention is more than just an external force on a child's behaviour. He suggests that the link between the use of tools (strategies, modelling, signs) and the development of speech and language affects the psychological functions of the child such as perception, attention and sensory motor operations (Vygotsky, 1978, p31). Köhler (1925, cited in Vygotsky, 1978, p 31) suggests that the "...entire process of problem solving is determined by perception" - how the child perceives the task (too easy, too difficult, familiar, unfamiliar) will determine how much attention and effort he will put into achieving it, which will ultimately determine the type and quality of the result (the sensorimotor operations). Attention, according to Vygotsky, is a critical element of the learning process - "...the ability or inability to direct one's attention is an essential determinant of the success or failure of any practical operation" (Vygotsky, 1978, p 35). He argues that the child starts to control their attention by using the language, words and behaviours they have learned

so far through their social and cultural context. As their cognitive functions develop, the child is better able to decide what is important and what can be ignored. They are able to use their prior knowledge to view the present task and decide on an appropriate response, as well as deciding on how their actions now will affect their situation in the future (Vygotsky, 1978, p 35). The concept that deciding if behaviour in the present will affect the future, forms the basis of one of the theories of motivation (to be reviewed further into this section).

Vygotsky argues that attention is key to helping the child decide if they are going to be successful or not in attempting the task. Attention is key to being guided through the ZPD. The ability to pay attention is a product of the child's knowledge of language, speech and behaviours. Inattention could be a sign of frustration, which in turn may indicate that the task is too difficult or that the scaffolding used by the teacher is not at the right level for the child. Attention is key to linking prior knowledge to the new information. This concept of being able to connect the present with the past lays the foundation for Vygotsky's notions of memory (to be reviewed in the section on memory).

Memory

Vygotsky argues that there are two kinds of memory - the natural memory, which is very close to perception and comes from the direct influence of the external stimulus (as Piaget suggests), and the memory that is connected to the child's social development (Vygotsky, 1978, p 39). It is this second form of memory that is instrumental in Vygotsky's theory of how learning happens.

A key element in Vygotsky's theory of learning is that of signs. Signs are the "self-generated" stimuli which initiate a response or behaviour (Vygotsky, 1978, p 39). Behaviour at a very basic level is initiated by a simple stimulus-response (S-R) action. No sign is involved here. However, a S-R that is mediated by a sign (for example, an action or verbal instruction from a teacher) becomes what Vygotsky calls a "sign operation" (Vygotsky, 1978, p 39). This mediator creates a new relationship between the stimulus and the response, and the mediated knowledge becomes incorporated into the resultant behaviour - it becomes a piece of knowledge that the child can then call on in the future. Sign operations are associated with this second kind of memory. Sign operations could also be seen as the thoughts which guide our

actions. These thoughts are influenced by the social and cultural environment of the child. Vygotsky goes on to argue that the use of signs creates new, ever more complex psychological processes (Vygotsky, 1978, p 40). I understand these to be similar to Piaget's schemata. The crucial difference between Vygotsky's notion of building knowledge and memory and that of Piaget's, is that Piaget believed knowledge (and therefore memory) was created by the individual through interaction with the physical environment. Vygotsky, on the other hand, argued that knowledge (and therefore memory) cannot develop in isolation or without mediated guidance or input from the social and cultural context. However, sign operations cannot simply be passed down by adults (Vygotsky, 1978, p 46). For knowledge to be created, the child has to "make it his own" through repeated practise and mediation (*ibid* p 46). Each sign operation precedes the next one, and each are linked (as are Piaget's schemata).

According to Vygotsky, in the early stages of development, a child's thinking depends on their memory - thinking is based on remembering concrete objects (Vygotsky, 1978, p 50). "To think means to recall" (*ibid* p 50). As the child gets older, their thoughts, the use of signs (such as strategies, recall techniques) and their mental structures become more abstract. At these later stages, "...recall means to think…" (*ibid* p 50). It is my feeling that the boys I teach may be transitioning between these stages of thinking and may not quite have left the more concrete stage of development, yet are expected to think about words, their spelling and their meaning in a more abstract way. Perhaps they can sense they are not achieving what they feel they should be, and this leads to frustration. Frustration within Vygotsky's ZPD indicates, then, that the activity is set too high for the child to achieve.

Vygotsky argues that "the very essence of human memory is in the fact that human beings actively remember with the help of signs" (*ibid* p 51). Memory is dependent on attention, which in turn, is dependent on the child's use of language and the combinations of signs and tools he finds within his social and cultural context.

Knowledge

Like Piaget, Vygotsky states that humans are active participants in their own lives, and therefore construct their knowledge (Vygotsky, 1978, p 123). The difference is that Vygotsky argues that knowledge is socially constructed - it cannot happen without the social and cultural influences of the child's environment, nor can it happen without mediation by a more knowledgeable other. However, like Piaget, the better the quality of the learning experience

(i.e. the task or activity starts at the *child's* level of knowledge and guides them through the ZPD to a higher level of knowing), the better the quality of knowledge stored. If the task is correctly planned, the child will feel no frustration, and will therefore enjoy the experience, thus making strong, positive links to his prior knowledge. Language and its use is a crucial element in Vygotsky's theory of learning as he contends that language shapes our thoughts and actions. He argues "...the most significant moment in the course of intellectual development...occurs when speech and practical activity...converge" (*ibid* p 24). He goes on to state that "the very essence of human memory consists in the fact that human beings actively remember with the help of signs" (*ibid* p 51). For Vygotsky, then, the quality of the knowledge that will become prior knowledge (that which is stored in long term memory) is heavily dependent on the child's knowledge of his language, his social and cultural contexts, the quality of the mediated learning experiences, how he is able to express himself either out loud or internally (his thoughts) and the quality of the tools and signs he has access to.

Vygotsky's theory was useful to me in many ways that were different to Piaget's theory. I was able to incorporate more streamlined lessons for the boys from a deeper understanding of the ZPD and of the boy's home environment as far as attitudes towards spelling was concerned. Having a goal and a reward to work for seemed to incentivise some boys, and their weekly spelling test results improved, but their applied spelling did not. It seemed that the boys only connected the goal and reward to the learned spelling, and "forgot" about it when doing their different writing tasks. This 'forgetfulness' can be attributed to a lack of motivation in getting the spelling correct – the effort, for whatever reason, was simply too much. Like Piaget, Vygotsky was clear that motivation played a significant role in the learning process. This will be dealt with in more detail in Chapter 4.

Piaget and Vygotsky both highlighted attention, memory and knowledge as key concepts in the learning process. Both theorists agree that knowledge is constructed (Piaget, by the individual; Vygotsky through social interactions), and that the quality of the constructed knowledge depends on how much attention is paid to the learning experience, and how good the child's prior knowledge is (long term memory) in order to assimilate or accommodate the new information, or to make sense of the new stimulus. Both theorists agree that motivation plays a key role in influencing how a child reacts to a given task.

But before I take a closer look at motivation – what it is and how it affects learning – I would like to include here other reviews of attention and working memory, as they helped shape my understanding of the role the two concepts of attention and working memory have in the learning process.

Additional reviews of attention and working memory

Attention

Very little can be learned if attention is not paid to the task or to the new information being presented. Think of a situation where a friend is talking to you. If your attention is elsewhere, you will not remember much of what they have said. It is exactly like that in the classroom - if the student is preoccupied for whatever reason, they will not take in important concepts or the instructions the teacher is giving out. If they drift in and out of focus, the student may only grasp bits and pieces of the information and so create an incomplete understanding of the concept being taught. The amount of attention we pay to new information affects the quality of memory we create around that information - attention "conducts" the "orchestra" (Levine, 2002, p 51), which is made up of memory, linking knowledge to what is known already and then co-ordinating an output (such as an answer, solving a problem, writing a sentence).

Eysenck (1993), a cognitive psychologist, describes attention as being the "selectivity of processing" (p 42). Attention, then, can be seen as the gatekeeper for which stimuli enter into the learning situation. He argues that there are two kinds of attention - focused and divided (Eysenck, 1993, p 42). Focused attention is when there is only one stimulus involved. Divided attention happens when the student is trying to attend to many different stimuli at the same time - such as coping with the noise of the classroom, while trying to attend to the set task but also trying to listen to the instructions the teacher is giving. Sometimes, the student may have already mastered some elements of the task, in which case these become automatic responses (*ibid* p 58). The student does not need to pay attention to them, thus freeing up more capacity for attention which he can then apply to the new or more difficult aspects of the task. This has implications for spelling, as the more the student has to focus on how to spell each word correctly, the less attention is available for other important aspects of writing such as sentence structure, selecting better vocabulary and getting their ideas down onto the page. In some instances, the student places more importance on getting their ideas down, and therefore pays less attention to correct spelling.

Although each of these theories has helped me understand the role and importance of attention in learning, I needed to have a deeper understanding the possible causes of inattention, and what these causes could look like. While some of the boys I teach had been diagnosed with ADD (Attention Deficit Disorder)[3], many are not. Although the ADD diagnosis of a physiological reason being the cause for not being able to pay attention to tasks could account for some learning not being effective enough to consistently apply their spelling to writing tasks, I still had a feeling that there was more to the concept of attention than simply being a case of either focused or divided attention (Eysenck, 1993, p 42).

Of the boys who did not have an ADD diagnosis, many still displayed the inability to pay close attention in spelling and writing lessons. Some boys would display good focus in subjects such as Maths but could not settle and focus when it came to spelling and writing activities. To me, all three theories outlined above appear to refer to attention as being only either focused or divided. I needed to understand why focus could be directed in some situations in the classroom and not in others. I needed to know what could affect the ability to pay attention.

In his book *A Mind at a Time* (2002), Levine, argues that the most basic "...instrument for learning…" is the neurodevelopmental function (p 28). These functions are intricately linked, and together, make up the eight different neurodevelopmental systems responsible for learning (p 30).

These eight systems are:

1. The attention control system
2. The memory system
3. The language system
4. The spatial and ordering system
5. The sequential ordering system
6. The motor system
7. The higher thinking system
8. The social thinking system

[3] Attention Deficit Disorder: a disorder that affects the chemical transmitters that transfer the electric pulse between neurons in the brain.

For the purpose of this section, I will only look at the first system - the attention control system. According to Levine, the attention control system can be broken down into three forms of attention controls. Each one of these forms of control is made up of different neurodevelopmental functions mentioned above (Levine, 2002, p 58). The relationships between these forms and functions are summarised in the diagram below:

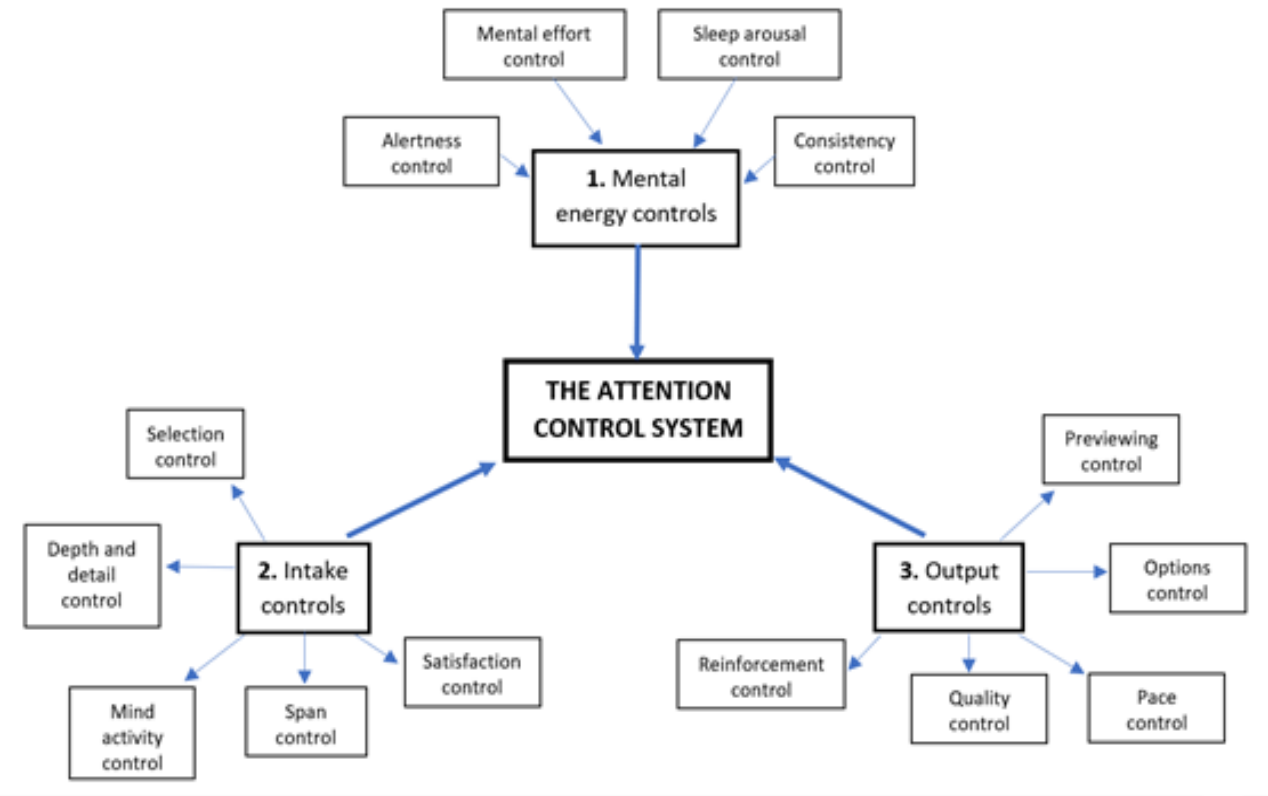


Figure 1 - The elements of the Attention Control System (Levine, 2002)

Through observation and questioning, I noticed that many of the boys I taught seemed to struggle mainly with the controls associated with mental effort (how hard the task is perceived to be), consistency (application of learned spelling was inconsistent), mind activity (*anything* was better than doing this task!), previewing (the ability to see what needs to be done and how to do it), the option control (choosing different options with which to learn, apply and check spelling) and reinforcement controls (the ability to see what works and what doesn't, to learn from mistakes).

I have had some measure of success in isolating some of these problem areas and showing the boys some simple strategies to use to help them cope with the dysfunction of these different

neurodevelopmental functions, but overall, the ability to apply their spelling did not improve significantly.

The ability to pay attention is crucial for effective learning. Piaget and Vygotsky agree on that point. Where they start to differ is on how much importance they each attribute attention to have in their respective theories of learning. Vygotsky has the advantage over Piaget in that they were able to use more modern technology and had the knowledge of neuroscience at their disposal. Levine (2002) gives depth to this knowledge of the role of attention and puts attention front and foremost in the learning process. He describes this role aptly when he says that attention is the conductor that integrates the "... performing brain systems [that] are akin to the parts of an orchestra…" (Levine, 2002, p 51).

However, attention does not stand or operate alone. It is intricately linked to memory and the creation of new knowledge.

Memory

"If any one faculty of our nature may be called more wonderful than the rest, I do think it is memory. There seems something more speakingly incomprehensible in the powers, the failures, the inequalities of memory, than in any other of our intelligences. The memory is sometimes so retentive, so serviceable, so obedient - and at others so bewildered and so weak - and at others again, so tyrannical, so beyond control!" (Jane Austen, *Mansfield Park*).

Jane Austen sums memory up exactly. Memory failures in the classroom can be catastrophic on a personal level. Think of the student who has spent so much time learning for a test, only to "forget" all they know when it comes time to write. Think of the times you have had an amazing thought, only to forget it the next second. Or the time you had an answer to a question, but when asked for it, the answer was gone. Even that "tip of the tongue" moment involves a memory failure.

Memory is that part of the brain that encodes, stores and retrieves information. Both Piaget and Vygotsky concur on that. But each of these theories has slight differences in the way they perceive the role of memory in learning.

In the last ten years or so, memory - how it functions and how it affects learning - has received a great deal of attention from researchers. Henry (2012), Gathercole and Alloway (2011) have researched the role of working memory and what affects its functioning in great detail. Previously, memory was understood to be one of two kinds - either short term memory or long term memory. Short term memory was just that - it operated for a very short period of time. In some of the earlier theories of cognitive development, attention is seen as being synonymous with short term memory. Long term memory was the term associated with knowledge. Later research added a third form of memory - working memory (Baddeley and Hitch, (1974, as cited in Shell *et al*, 2010, p19).

Short term memory was perceived as learning's front entrance. In past theories of cognitive development, it was often seen as the same as attention (as Vygotsky proposed). Either way, it is heavily dependent on the ability to pay attention to the task, and information is only kept there for a few seconds.

Baddeley (as cited in Henry, 2012; Shell *et al*, 2010) was the first to give the term "working memory" to this part of memory that seemed to have a limited, short term capacity. Working memory is the space where new information is first processed - "...a sort of mental jotting pad in situations when there is no other external record such as written notes or a calculator' (Gathercole & Alloway, 2007). It has a limited capacity, is transitory and can be seriously affected by tasks that are '...cognitively too demanding' (Eysenck, 1993; Sweller, 1988, as cited in Deans for Impact, 2015). Alloway goes so far as to argue that working memory '...is a better predictor of academic success than IQ because it measures a student's potential to learn, not what they have already learned' (Alloway, 2011 p 15). Alloway suggests that working memory has two components - auditory and visual / spatial. In the classroom, the auditory component of working memory could translate into a situation where, if a child cannot hear the sounds properly and thus cannot connect them to the sequence of letters correctly and efficiently, he would not be able to consolidate the letter-sound combinations needed for spelling and reading (the auditory component of working memory). If he could hear the sounds well, the visual spatial component of working memory could cause him to struggle to physically write the words on the page, as he could not access the *look* of the letters, or how they made up a word, from memory quickly enough to spell accurately. This understanding ties in with psych-ed reports I received, which suggested that some boys had poor working memories, and so found it difficult to remember the sequence of letters in words, or which

letters made up which sounds. It also partially explained how some boys could remember what a word *looked* like better than they could break it down into its sounds. Levine (2002) points out that a good working memory can be subject-specific (p 104). A student may have a good working memory in some academic areas, but not in others. In this case, a student may be able to cope well with the demands of a complex Maths problem but may struggle to apply correct spelling when writing. This could be related to how the student sees him/herself as a 'speller' or 'mathematician'.

In addition to the two parts of working memory (verbal and visual-spatial working memory), Alloway also stresses that space, time and effort can affect how effectively working memory can function (Alloway, 2011, p 15). Space refers to the amount of space available in working memory to hold and manipulate the information; time refers to how quickly the information is given, how quickly that information has to be processed and how quickly a response is expected; and effort refers to the amount of energy it takes for the student to complete the thinking task. Very often, teachers and parents ask the student to 'try harder'. As Alloway points out, '...many children … try hard every day and still struggle'. This mental effort, one of Levine's forms of attention controls (2002, p 60), plays a huge part in how students tackle tasks they see as difficult, or that they feel they are not good at. Repeated failure in tasks that require too much effort form links to negative in the student's memory, thus making it even harder to get motivated to apply their knowledge.

Henry (2012) adds to this view of working memory by breaking its functions into two more components - the central executive and the episodic buffer (Baddeley, 2000, 2007 as cited in Henry, 2012, p 21). The central executive is responsible for the control and allocation of attention, while the episodic buffer integrates all the stimuli coming from the five senses and movement (Baddeley, 2000, 2007 as cited in Henry, 2012, p 31). Linked to the function of the episodic buffer is the notion of "chunking". This is a key element to understanding the function of working memory. Chunking refers to the number of information "bits" that can be grouped together to form a chunk. For example, the number 9 can be seen as one chunk of information. On the other hand, the number 911 can also be seen as one chunk of information. The number 91134572 can be grouped as 9113 and 4572 - two chunks of information. One of the functions of the episodic buffer is to integrate all the information coming from the stimulus, and it can do this more effectively by chunking the information into groups. However, the capacity of the episodic buffer is limited - some research points to the belief that the episodic buffer can deal

with seven chunks at a time, while Cowan (2005, cited in Henry, 2012, p 31) argues that it can range from between three to five chunks in adults. The notion of chunking leads to the idea that the more information that is linked into one chunk, the bigger the capacity of the episodic buffer, and the more information working memory can hold on its "sketchpad" (Henry, 2012) while solving the problem at hand.

Levine (2002) added the word "active" to the term working memory which I consider to be appropriate, because a passive working memory would not enable thinking, reasoning and learning. This agrees with the theories of Piaget, Vygotsky and PASS outlined earlier, in that the child has to be an active participant in his interaction with his environment for him to learn anything. Levine (2002) goes on to explain the implications for classroom learning of a poor working memory, or small "sketchpad". For example, Levine (2002, pp 100 - 102) says a child who experiences difficulties with their working memory:

- will lose track of the first part of the task by the time they get to the end of the task. This has implications when the teacher is explaining a new sound-letter combination, or when explaining the task itself. They will also forget how to spell a word in the time it takes them to construct and write a sentence
- cannot keep track of all the elements of the task while they are doing it
- will struggle to keep the image of the word in mind while trying to use it in an activity - especially if they have to keep comparing it to the different ways of spelling that same sound before they write it down
- will have trouble applying many different elements of the task to what they are doing. In other words, if they have to write a sentence or a paragraph, not only do they need to remember what they want to say, but they also need to remember how to hold their pencil, how to punctuate the sentence, the spelling of all the other words in the sentence, the meaning of their sentence and so on. If most of these actions are not automatic and therefore take up space in working memory, the working memory will be overloaded with the things it has to remember and integrate, and spelling is often the casualty.

These are just a few ways in which a poor working memory may become visible in the classroom. Of the boys I have taught, most of them display all these traits, and more.

Conclusion

Although the different theorists have different ways of explaining memory, its different elements and the function of each element, all of them agree that attention is intricately linked to creating memories (knowledge stored in long term memory) from which to draw on in future situations. Piaget believed the child constructed his own knowledge through investigation; Vygotsky argued that memories (knowledge) were constructed through social engagement with a more knowledgeable other in the context of the child's social and cultural environment; Vygotsky placed huge emphasis on the value of memory because accessing prior knowledge is the first step in engaging with a task. The theorists all agree that knowledge is linked. They also agree that the more information is grouped together into one chunk (Piaget's schema, Vygotsky's sign operation), the larger the amount of information that can be held in working memory to manipulate the elements of a task and to provide an outcome.

Modern researchers have the advantage of improved technology with which to observe the brain while learning, and so have provided a deeper understanding of the elements of memory, what affects its efficient functioning, and how it shapes and affects the learning that happens in the classroom. Levine (2002) has given us practical examples of how a memory failure looks in the classroom situation. Ultimately, all the theorists and modern researchers agree that *attention and memory affect the quality of knowledge* constructed by the child.

In spite of this knowledge of how learning happens, I still could not fully understand how a child had knowledge that they could not, or would not, use. The spelling activities addressed interest, the level of the student's development, and took into account the different levels of functioning of working memory together with any physiological difficulties such as poor processing speed. The lessons provided many and varied opportunities to practise and use the words in context. The lessons were planned keeping working memory, attention span, and linking new material with prior knowledge in mind. Different kinds of rewards were put in place to incentivise the boys, yet the disconnect between learned and applied spelling appeared to be unchanged. While motivation ("affect" in the case of Piaget) was dealt with generally, I felt a deeper understanding of the beliefs, values and attitudes towards spelling on the part of the individual child could greatly enhance my understanding of the role motivation played in learning and could therefore help me understand the possible disconnect between learned and applied spelling knowledge.

CHAPTER 3: Motivation is complicated

Although motivation in learning is intricately linked to attention, knowledge and memory, I have chosen to review what the Piaget and Vygotsky have theorised about it separately, as this aspect of the learning experience is key to this study.

"Education is not the filling of a pail, but the lighting of a fire" (W. B. Yeats). I saw this quote a few years ago and it has always stuck with me. It saddens me to come across young students – of all ages – who have lost that fire. They have given up on learning, labelling themselves 'poor learners', or worse still, 'stupid'. It saddens me even more when these students are only nine and ten years old. But I believe there is hope, and I believe this hope lies in understanding the role motivation plays in learning. The following chapter provides a review of motivation.

In my search to understand the problem of the disconnect between what a child knows and what they choose to apply, I began to understand the importance of the role of *attitude* in learning. By observing the boys, I realised that this attitude was often a result or a reflection of how they felt about spelling. Most of the boys I taught were very positive about subjects such as Maths or Science and had many positive things to say about the subject and their own abilities in those areas. However, when it came to spelling, and particularly applied spelling, the attitude was very different. These confident boys became almost defiant in their defence of their beliefs that they were born not able to spell. Their language around spelling was mostly negative and dismissive. I needed to understand why. The motivation to learn something, and use it, cannot be dismissed, glossed over or ignored.

The Unified Learning Model (ULM) (reviewed in Chapter 4) helped me put into perspective the importance of motivation in learning by highlighting motivation's role in the learning process and by identifying motivation as a key concept in learning – as important as attention, memory and knowledge. The ULM model helped me link the connections between working memory, attention, prior knowledge and motivation, and made it clearer for me as to how each one of these concepts is intricately linked to all the others. I realised I had underestimated motivation's influence on learning.

Levine (2002. p 263) states, "Motivation is complicated. Success nourishes motivation and motivation makes further success more likely. Failure dampens motivation and a lack of

motivation makes continuing failure a near certainty." In the classroom, this dampening of motivation can have devastating effects. Students who are academically capable appear to be unable to apply their knowledge. Understanding the role of motivation in learning cannot be stressed enough. Teachers often comment that a student 'cannot seem to apply his knowledge' to different tasks or they refer to the student as 'lazy' as they do not seem to put effort into trying to apply the concepts they have shown to have mastered in class activities. 'Lazy' is often accompanied by the comment 'he needs to try harder'. I believe a student who seems unable to apply their knowledge *is* trying hard, but with each successive failure, the expectation of failure becomes a self-fulfilling prophecy. Applied spelling is a perfect example of this disconnect between having, yet not using knowledge, as incorrect spelling of words previously learned becomes very visible in the student's extended writing.

Although the theories of how learning happens in general, reviewed in Chapter 3, emphasise the importance of the role of emotions and motivation in the learning process, they remain at the level of general statements. In this study, I would like to see what 'emotions' and 'motivation' during learning look like on an individual level. It has been my experience that, generally, motivation is considered only when *planning* activities - if the activity is interesting enough, or appeals to the student's areas of interest, or is pitched at the correct level of competency, then learning will happen. Teachers could be aware that the child may 'not like' a subject or may 'find it really hard'. It has been my experience that these difficulties to learn are often attributed to one, or a few, physiological barriers to learning the child may, or may not have, such as a slow processing speed or a poor working memory. Seldom is it attributed to a lack of motivation. I believe that a deeper understanding of the child's beliefs, attitudes and expectations around their abilities (or inabilities) to apply their knowledge, will help to understand the role motivation has played in getting them to this point in time in their learning journey.

I will now look at where Piaget and Vygotsky place motivation and how they view motivation's influence on learning.

Piaget

Many earlier theorists of learning focused primarily on the cognitive aspect of human development. The emotional and motivational aspects (affect) were secondary and separate

aspects to learning (Piaget, 1981, preface p X). Piaget, however, argues that along with the physical and cognitive stages of development comes a corresponding affective development. Cognition and affect are different in nature but cannot be dissociated from each other (Piaget, 1981, p 5). We cannot find behaviour originating only in affectivity and without any cognitive aspects, but on the other hand, we cannot observe behaviour that is purely cognitive (Piaget 1981, p 2). Therefore, I believe we cannot study classroom learning without taking into careful consideration the effects of affect.

Piaget argues that affect (emotions and motivation) is a function of intelligence and that the disequilibrium between assimilation and accommodation on an affective level provides the energy needed for action or behaviour. Affect "…serves as the regulator of action" (Piaget, 1981, preface p xi). This means that affect could have a huge influence on the rate at which the child develops knowledge – either speeding it up if the child has a positive attitude towards the learning experience, or possibly slowing it down should the child's attitude be negative towards the task. I believe this is the area into which the boys fall who find it difficult to apply their spelling, even though they have prior knowledge of phonemes, word construction and meanings.

Piaget argues that affective factors are present in all forms of cognitive activities (Piaget, 1981, p 3). A child engaged in a task such as learning to spell, or a writing activity where they need to apply their knowledge of spelling, will feel many emotions. These could include pleasure, boredom, frustration or fatigue if the task is effortful. It could include confusion if the child is not at the right cognitive stage to be able to deal with the abstractness of the symbol-sound correlation that is spelling. At the end of a task, the child can also feel differing emotions – success or failure, a sense of achievement, or possibly even defeat or humiliation. These feelings, because they are inseparable from the act of learning, will surely come to the fore when engaging in future tasks of a similar nature.

Both cognitive and affective factors can be found in the main characteristics of learning – adaptation, assimilation, accommodation and equilibrium (Piaget, 1981, p 4). According to his theory of how learning happens, all behaviour is adaptation, and adaptation is the state of equilibrium between the child and his environment (Piaget, 1981, p 4). Assimilation is the aspect of adaptation that incorporates the new information into the existing schemes of behaviour. Assimilation may be perceptual, it may come through the senses, or it may be

conceptual (the ability to grasp the concept of speech being represented as symbols or the ability to apply knowledge). Some spelling programmes aim to incorporate all three sources of information – they have songs or rhymes for the child to learn, as well as pictures, actions and vocabulary to link to the new letter-sound connection being taught. Other programmes have different approaches (these will be discussed in more detail in Chapter 5). The cognitive aspect of assimilation is understanding (*ibid* p 5) and the strengthening of the child's prior knowledge (the ULM). The affective aspect of assimilation (i.e. my focus in this study) is personal interest in the task. It is the child's affect that wonders: Can I do this? How much effort will it require? What will I gain from it? Will it make me feel good if I succeed?

Accommodation is the aspect of adaptation that changes the structure of a scheme when assimilation cannot happen as the new information does not fit with his prior knowledge schemes. Cognitively, this results in an adjustment in the child's thinking and therefore his behaviour. The affective aspect of accommodation lies in the novelty of the task – i.e. the child's interest is piqued as the stimulus or information is new and possibly different (Piaget, 1981, p 5).

Adaptation (behaviour) arises out of an equilibrium between assimilation and accommodation (*ibid* p 5). The amount of effort a child will put into a task, therefore, will depend on the structures of their prior knowledge, how easily they can assimilate the new information into their thought and behavioural schemes (cognitive aspects of learning), and their personal interest in the task or even the expected outcome of the task (affective aspects of learning). A disequilibrium between assimilation and accommodation in the learning process produces the energy needed to act. Piaget refers to this energy as affect (motivation) and argues that its role is to serve as the regulator of all our behaviour. In other words, "motivation deals directly with the dynamic sources of action and behaviour" (Furth, 1969, p 5), which means that without any motivation the child will not make the effort to interact with their environment (Furth, 1969, p 15). Once the child is motivated to react to or interact with the stimulus, they give the task their full, focused, voluntary attention. Paying attention is the start of the learning process.

The following diagram illustrates my understanding of the relationship between cognitive and affective development in Piaget's theory of how learning happens.

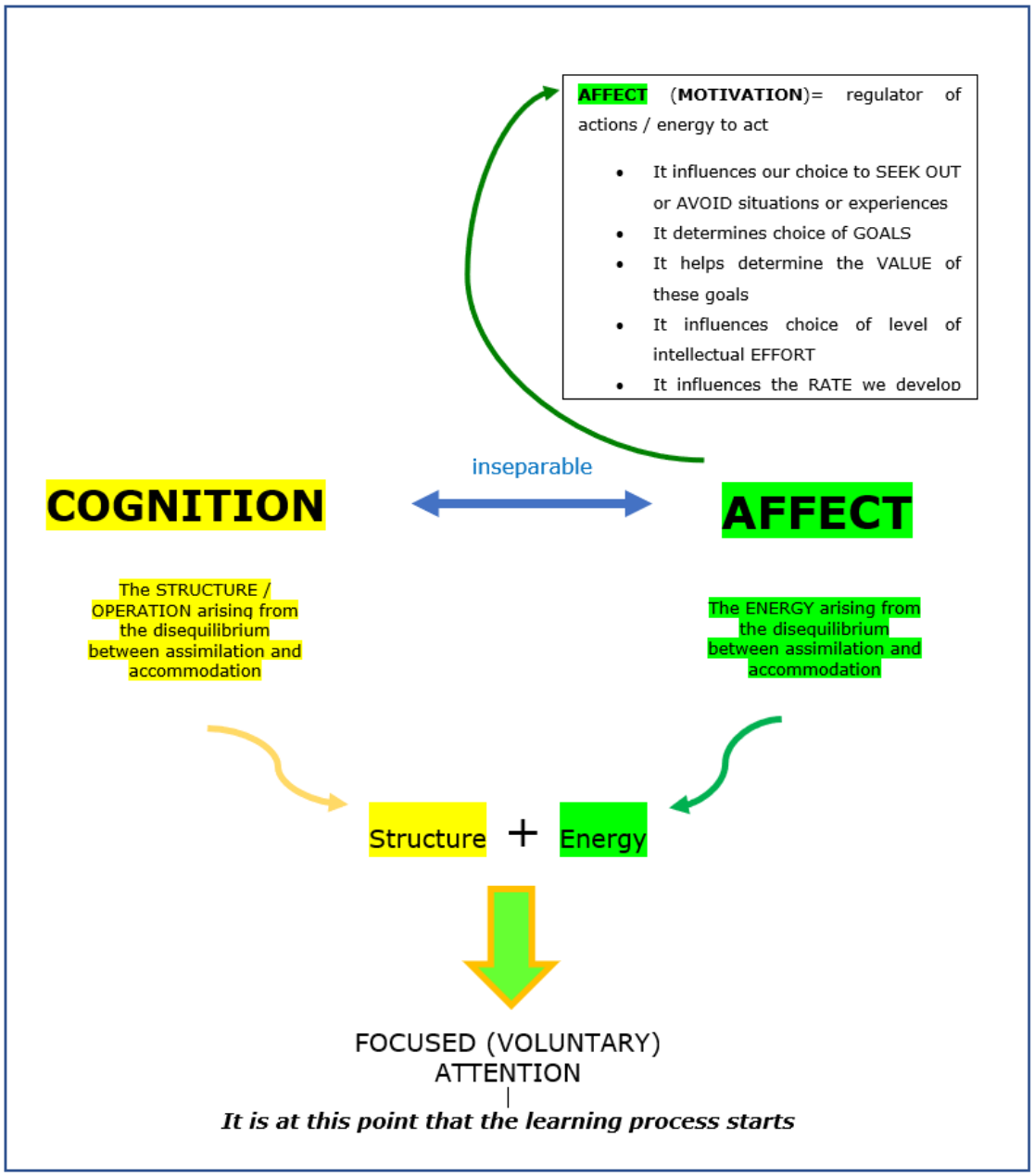


Figure 2 - The relationship between cognition and affectivity in learning according to Piaget

As outlined in Chapter 2, Piaget proposes that development – physical and cognitive – happens in stages. These stages are successive. Development must go through all stages consecutively, but the ages at which the child passes through them are not hard and fast. These ages are only approximations. It follows, then, that affective development also goes through the same stages, at around the same ages.

As I am focusing on boys aged between 9 and 10 years old, I will only review the stages applicable to these ages.

Many of the boys of this age that I have taught over the years express feelings of frustration, fear and a sense of helplessness when it comes to spelling – particularly when it comes to 'knowing' the correct spelling when writing sentences or stories. Some of boys, when asked about their errors, cannot even see that the spelling was wrong until it was pointed out to them. Every boy dreaded Friday spelling tests. Many of the boys simply shrugged off their results with apparent lack of caring, some were indifferent, but many were genuinely upset as to how they could get almost full marks for the individual spelling words but nothing for the dictated sentences (application of spelling). What I also noticed was that with time, most of the boys grew to accept their difficulties and stopped even trying. There were too many other things to think about when writing. The effort needed to be constantly mindful of correct spelling was too overwhelming. Too much effort means there will be little to no motivation to try. It was this breakdown in the connection between learned and applied spelling that started me on this journey.

For the purposes of studying the development of affect in children, Piaget broke the developmental stages down into two periods of development - pre-language and post-language, with three stages in each period (Piaget, 1981, p 14). The first period of three stages deals with the intellectual and affective development of children from birth to two years of age. This is the pre-language period where the feelings and emotions of children within this age group are directed towards themselves and their own needs (unsocialised behaviour) (*ibid* p 15). Although I am not looking at this age group, it is important to acknowledge that all affective development builds on the previous stages. This pre-language stage is important for my study in that it is the stage where feelings such as joy, contentment and disappointment first start to appear (*ibid* p 14). These feelings have a significant impact on later development, and especially in academic success. Between the ages of six months and two years, i.e. the last stage in this period of affective development, feelings that initiate action and those that terminate the action (such as success or failure) are becoming more prominent (Piaget, 1981, p 22).

The third stage in this pre-language period sees the beginning of "intelligent acts" (*ibid* p26). What emerges in this stage are actions where affect influences intentional behaviour. It is the time when "feelings linked to the regulation and co-ordination of action" (*ibid* p 42) start developing. These are linked to decentration, where the child begins to consider the intentions and actions of people other than themselves (*ibid* p 26). Affective decentration means they

starts to see themselves in comparison to others and starts to have feelings directed at other people. These developments will have an impact on their developing self-esteem and also how they views their relationship with their teacher.

The beginning of the second period of intelligence and affective development is a crucial one for me to consider. Piaget calls this the 'pre-operational representations' stage. (Piaget, 1981, p14). It lasts from two years (the time around which the child starts to learn that sound can mean something – his first words) to around seven years (where he learns that sounds can be represented by symbols – the start of reading and spelling). Piaget argues that the child's first words name an object – they are nouns. From there, as the child interacts with the significant adults in their life, and with their peers or siblings as they grow older, they learn to speak in simple phrases, building up to sentences and paragraphs. The child goes from the part to the whole. How they speaks - the words they use, the meaning they attach to words and actions - is influenced by how their thinking has been socialised through their social and cultural environments.

At around five or six years old, the child will start to learn that their speech can be represented by symbols (letters) and each symbol has its own sound connected to it. When clumped together in certain ways, these symbols will represent a word, and the words can represent a thought (a sentence) and, therefore, will also represent meaning. This is the time when the child begins to socialise, and to use speech to represent thinking. From the affective perspective, the child begins to acquire interpersonal skills and social (moral) feelings (Piaget, 1981, p 14). This preoperational stage is where the child develops a sense of self-esteem, as they can compare themselves and their achievements to others (*ibid* p 47). What is also important in this stage is that feelings become permanent – they last longer than the situation that gave rise to them (*ibid* p 47). This is important to take into consideration when interviewing the participants, as any failure around spelling and writing during this stage will impact his beliefs he has about being a good speller, and attitudes towards any future successes in spelling. This could include not only a failure to consolidate the sound-symbol connection, but the child may also experience a sense of failure to please the teacher or his parents.

Children in this stage of development begin to develop moral feelings, such as obedience, fear, affection and respect (Piaget, 1981, p 52). The different social cultures they grow up in will determine how the child thinks and feels about different aspects of life. The attitudes of their

family around spelling and its importance will influence their way of thinking about it. The culture of the school they attends will also influence this thinking. However, these feelings are not yet generalisable and are therefore not considered normative (*ibid* p 55). In the classroom, this may translate as the child wanting to do well to please their teacher or parents, but if they is not able to they may give up or find a behaviour that will distract attention away from the situation. Could this be the start of the patterns of avoidance behaviours – either towards general learning in the classroom, or even around something specific such as spelling?

The second stage of the second period, the concrete operations stage, is where the participants in this study lie. This stage is characterised by the conservation of feelings (that feelings last longer than the situation that gave rise to them), and the development of the problem of will (using experience to decide on whether to persevere or not) which includes moral feelings such as a sense of duty (Piaget, 1981, p 65). The will influences aspects of the child's thinking and actions such as the interpersonal relationship they have with the significant adults in their life, and their feelings towards what they feel they should do (trying to please their teacher, for example). During this stage of intelligent and affective development, the child begins to remember feelings attached to certain situations, such as spelling tests or writing tasks, and will bring these feelings to the task at hand. They will be able to weigh up the consequences of the reactions from the significant adults in their life, and then decide on a course of action. Many different external (for example, their environment or reactions from parents) and internal influences (such as fear, anxiety or satisfaction with what they have achieved) influence the child's thinking and will therefore also influence their feelings towards learning situations such as spelling and their ability to apply it when they need to. It is these beliefs and attitudes that have shaped their behaviour regarding spelling that I want to explore in this study.

All these affective developments lay down the foundation for how the child reacts to success, failure and perseverance later in life. While I am not specifically looking into the emotional and psychological history of the participants in this study, it is important to understand how their backgrounds and experiences of spelling could have an influence on how they view their abilities in the present time.

The diagram below illustrates my understanding of Piaget's theory of how affect (motivation or emotions) influences learning, and where the different aspects of affect could fit in. I have then extended this general theory to apply to that of applied spelling specifically.

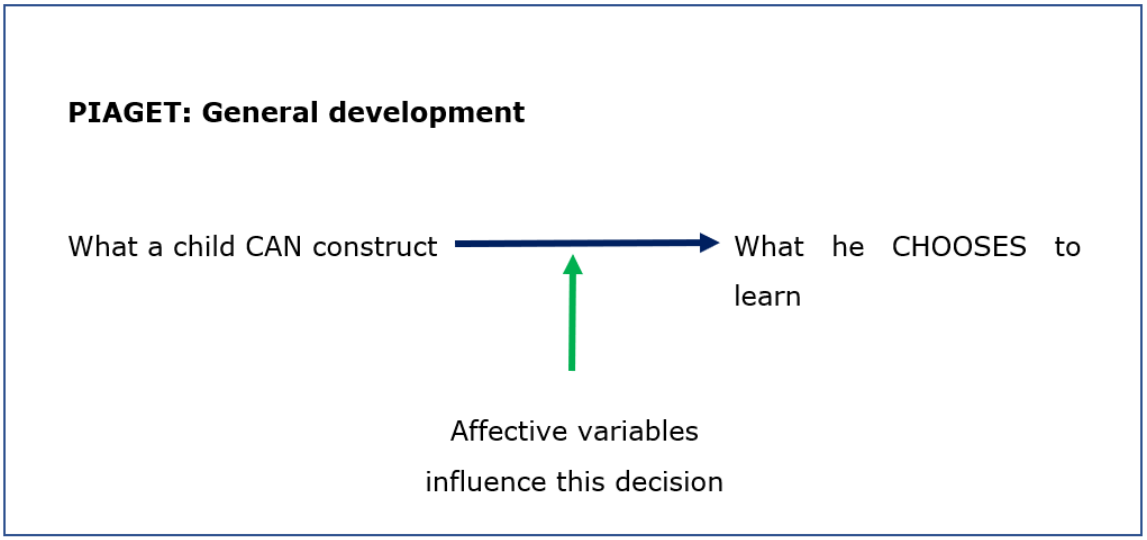


Figure 3 - Factors affecting what a child learns

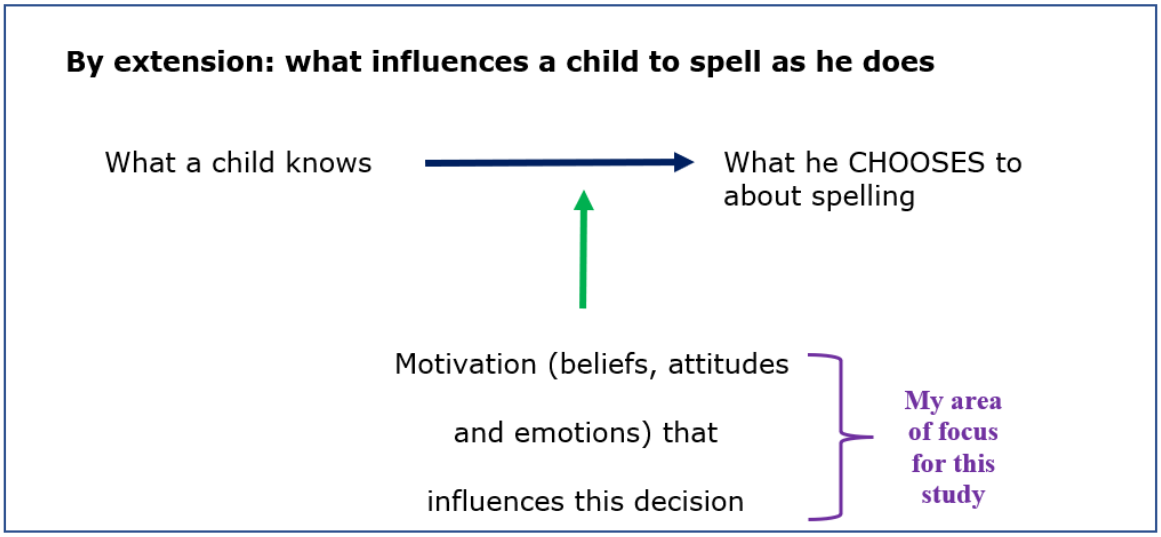


Figure 4 - Factors affecting applied spelling

I believe educators today tend to follow a similar trend to the earlier theorists of learning in that we seldom take note of the affective aspect of learning. We are so focused on *how* to teach, *what* to teach and *when* to teach it, that we often ignore the emotional (affective) aspect of learning. Yes, we may factor in the interest aspect of a task, but our planning is concerned mainly with teaching and developing the content and skills laid down in a prescribed curriculum. We tend to use the content and skills as a core around which to plan and teach and try to use interest to attract engagement. I believe we need to develop a deeper understanding of affect (motivation) and its role in learning, and to use that understanding as the core around

which to build a learning experience. Knowledge of how a child has arrived at the belief system they have of their abilities is crucial to understanding how best they will learn, and how best they will apply his knowledge.

Piaget's theory of a different-in-nature, yet inseparable, link between physical, intellectual and affective development helped me develop a deeper understanding of how affect develops at each stage of development, and what I could look out for or expect from this age group *in general*. But I also want to understand how each *individual* boy feels about spelling, what motivates him to keep trying, or what might lead him to give up and how his beliefs about his own abilities may prevent him from using knowledge he already has.

Vygotsky

Central to Vygotsky's theory of learning and development is the Zone of Proximal Development (the ZPD, see Chapter 2). I was curious to find out how motivation in learning fitted into this concept – particularly with respect to spelling and knowing how to apply it. Although I understood the concept of the ZPD in so far as it applied to lesson planning and classroom teaching, I did not have a clear understanding of how the child's thinking, their emotions and behaviour fitted into the concept. I was also unclear as to what role motivation played in being able to apply knowledge, such as spelling, to classroom tasks.

As spelling is all about making meaning of signs and symbols, it is important to understand how meaning fits into Vygotsky's theory of learning. At the critical stage of classroom learning, when the child begins to grapple with the concept that symbols (letters) can represent speech, I believe it is important to understand how speech and thinking are linked, and how making meaning of these early reading activities can affect the child's emotions (and therefore motivation to learn) around spelling and reading. Vygotsky argues that the child's thinking is directly linked to the development of meaning, and meaning is constructed socially through speech (Vygotsky, 1987, Vol 1 p 320). Furthermore, development of thinking dictates action, or behaviour (*ibid* p 324). He argues that '…all meaningful speech' has two aspects to it – the verbal aspect, which is associated with *external* aspect of speech, and the *semiotic* aspect, which is the meaningful aspect of speech (Vygotsky, 1987, Vol 1 p 320). The young child constructs this meaning from what they see and hear (Vygotsky, 1987, Vol 1 p 320). Where Piaget believed that the child's first word was a naming word (a noun), and that they developed

meaning from social interactions, Vygotsky argues that '… the meaningful aspect of the child's first word is not a noun but a one word sentence' (Vygotsky, 1987, Vol 1 p 320). That first word was full of meaning for that particular child. Their development of meaning and speech would then progress from the whole to the part. However, the external and meaningful aspects of speech do not develop at the same rate (Vygotsky, 1987, Vol 1 p 322). I understand this to mean that a child may learn to say the words and may learn how to use them grammatically (verbal aspect of speech) but they may not fully grasp their meanings. They may not be able to understand the meaning of the teacher's instructions. This is particularly important when the child is not a first-language user of English. In the classroom, a young child who has a good grasp of verbal language but who has not yet developed a sound understanding of the meaning of the words they use, could have trouble when it comes to understanding the concept that symbols (letters) represent the sounds of speech, as they do not grasp the meaningfulness of this concept. If they are unable to make meaning of the sound-symbol connection, they may experience frustration, which within the concept of the ZPD, would inhibit the possibility of effective learning taking place. My question then is, are children who have not yet developed the semiotic maturity (my phrase) within their thinking to handle the very abstract concept of spelling, at risk of developing negative emotions and feelings around spelling? Even if they receive empathetic, caring instruction from their teacher (the more knowledgeable other Vygotsky refers to), and even if their learning experience is scaffolded, are these children *really* ready for spelling and reading? Or will their experiences around spelling in these early stages lay down the foundations of negative self-belief as a speller? And how will we, as teachers, even know what level of understanding and meaningfulness each child brings to school? So often, we say 'this child has such a good vocabulary, yet their thought processes or levels of output (writing) do not match their use of vocabulary and grammar'.

Vygotsky acknowledges and emphasises the '…intimate connection and dependency that exists between the development of the emotions and the development of other aspects of mental life' (Vygotsky, 1987, Vol 1, p 332). The emotions a child feels in any given experience will be attached and remembered in future, similar situations. Vygotsky acknowledged that the basic emotions (sadness, fear, anger, happiness) were controlled by the brain (*ibid* p 336), and through modern research we now know this to be accurate. The amygdala forms part of the limbic system – the part of the brain that controls our basic, biological reactions to the stimuli that come through our senses. It is linked to our survival instincts and tells us whether to stand and fight, to run away from the situation or it gives us the fright signal, so we can be more alert

to our surroundings and possible danger. It is intricately linked to the processing of all our emotions, memories and motivation. So, when Vygotsky theorises that an '…emotional reaction is the unique result of a particular structure of mental processes' (Vygotsky, 1987, Vol 1, p 336), we can understand how a less-than-optimal experience in spelling for a young child could negatively colour their reaction to future spelling and writing activities. When a young child finds themselves in a situation wherein they are not comfortable but cannot run away from it (having to sit in class and learn spelling or having to apply their knowledge of spelling in a writing task), they may experience more intense emotions which can prevent them from performing to the best of their ability (*ibid* p 335).

'Learning in the ZPD involves all aspects of the learner – acting, thinking and feeling' (Wells, 1999, p 331, as cited in Mahn and John-Steiner, 2002, p 46). Within the ZPD, activities are structured and scaffolded according to the child's knowledge and abilities. The more knowledgeable other creates a safe and encouraging environment where the child is not afraid to take risks or make mistakes. So how, then, if a child learns to spell in the ZPD, do they develop the practice of not applying their knowledge, even though the teacher knows they have the knowledge with which to spell correctly? What could cause this disconnect between learned and applied spelling in the ZPD? The answer could lie in the way in which the young child begins to use their language and thoughts to consider their own behaviour, and the consequences of their actions. They begin to make informed choices, they begin to form intentions. They also start to identify intentions in others, and learns, through socialisation, to modify their actions. From what I understood of Vygotsky's arguments in Lecture 6 (Vygotsky, 1987, pp351 to 358) a rational action is one we will take if it benefits us. If the child finds satisfaction and success in an activity, they will be more likely to engage with similar activities in the future. A volitional action (an act of will) is the absolute commitment to achieve something. It is the perseverance to keep trying, even if the stronger desire is to give up. It is intricately linked to affect, or emotions. A 5- to 6-year-old child may not have developed strategies to persevere yet. So, a young child who is not yet ready to make meaning of the written symbols of spoken language, but is forced to by the nature of the classroom they find themselves in, may view spelling as meaningless and may experience repeated frustration. In an effort to cope, they try to create a different meaning to the spelling lessons, one with which they can cope (Vygotsky, 1987, Vol 1, p 356). This could result in them trying to avoid the spelling activities by chatting to their peers or even leaving the classroom entirely. These strong, negative emotions will be linked to spelling, and could influence their behaviour to

future spelling activities. Will (volition) involves choices and the choices are increasingly in the hands of the child as they develop cognitively and affectively. It is a matter of control – the child begins to understand that they do not always have to do what they are told, especially if it does not coincide with their own world-view. Would this be an example of 'testing the boundaries'? Vygotsky argues that emotions and learning are intricately linked through the interpersonal relationships (between teachers, parents and school friends) and intrapersonal relationships (how the child makes meaning of their language, environment and their own thoughts) the child develops throughout their lifetime (Mahn and John-Steiner, 2002, p 49). These are crucial in the early years as they shape the child's thinking and behaviours from an early age. The ZPD is a complex system that includes both the child and their teacher, the context of the learning, the environment, the activity or concept to be learned, emotions, the child's experiences (Mahn and John-Steiner, 2002, p 49) and they developing sense of autonomy (my addition). Any breakdown within this fragile system due to the task being too cognitively difficult, or because the child experiences fear or anxiety, or because they are just not ready yet to grasp the abstract concept of spelling, results in a less-than-optimal learning experience within the ZPD.

Conclusion

Motivation is complicated. The ULM brings together the different categories of motivation mentioned in the theories of learning outlined in Chapter 2 (goal setting, goal value, interest, contingencies and expectancies, self-efficacy and emotions) (see Chapter 3). Yet so many other things can affect it. What is common to the ULM, Piaget and Vygotsky, though, is that motivation is intricately linked to how effectively a child will learn. Motivation can either enhance the learning experience or diminish it. Its role in learning is so significant, yet as teachers we are quick to ignore it, too quick to focus on what *we* think the child needs. Could we, as adults, be developing programmes that do not fit the young child? What makes sense to us may not have any meaning for the young child. After all, children do not think or reason like adults (Piaget, 1967, p 86). Are we imposing our logical (adult) thinking on how spelling should be taught? Could difficulties arise in acquiring spelling patterns and knowledge because it is being taught too early / too confusingly / too quickly for the child? And especially for young second language English users? I believe these questions are worth considering, but perhaps in another study. I understand it is extremely difficult to take into account each and every child's beliefs, attitudes and motivational levels in every learning experience. Many

classrooms in South Africa have fifty or more children. It is only the lucky few who have less than thirty. But perhaps we can at least start with those children who seem to have given up. If we ask the deeper questions around motivation, we will get to the 'why' of the problem.

Simon Sinek, a motivational speaker and organisational consultant, talks about the Golden Circle of leadership (Sinek, 2009, p 37). Although he speaks to global companies, his theory could be valuable in education. The Golden Circle consists of three circles, one within the other. The innermost circle is the 'why'; the next is the 'how' and the outer circle is the 'what'. See the diagram below.

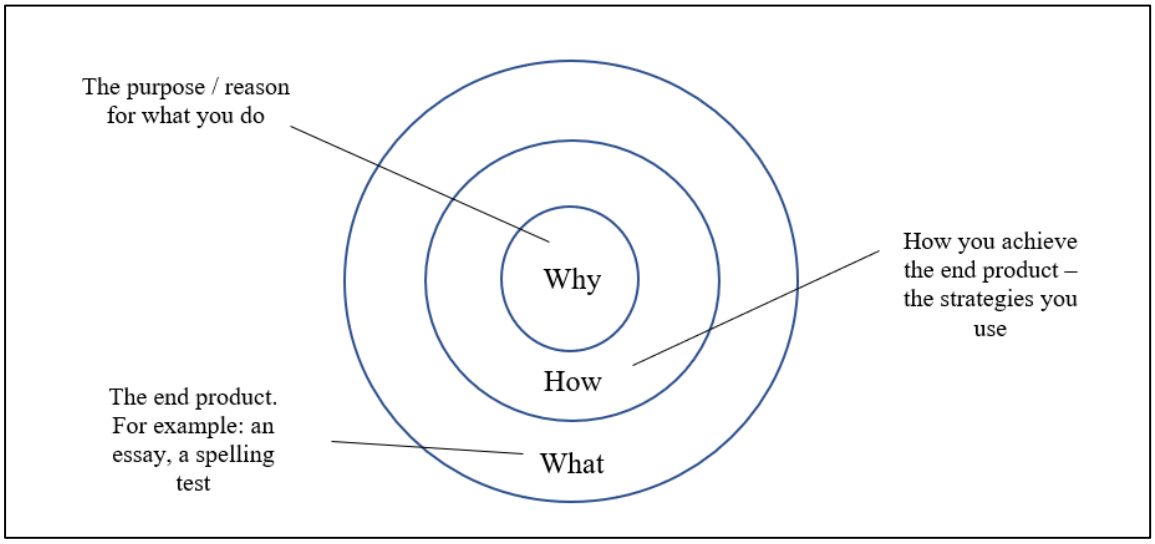


Figure 5 - Simon Sinek's Golden Circle as applied to learning

I have kept the meaning of each circle the same, but I have adapted the language of sales he uses to fit with the language of education. The 'what' represents what we would like the student to learn / produce / explain / demonstrate. It is 'what' the student does. The 'how' is how they will accomplish this. It could be by taking notes / drawing a diagram / creating a video or a speech / painting a picture / using a strategy. The 'how' also includes the information they need to use. The 'why' is the purpose. It is the reason for why the 'what' must be done. Without understanding the 'why' (the meaning of the activity) the student will fail to really learn from the experience. How many students do you know who have asked 'Why must I do this?', and we seldom have an answer except perhaps 'Because you need to' or 'Because the curriculum says you must'. Without understanding the 'why', they may not choose the optimal 'how' strategies to produce the best possible 'what' they is capable of. If a child cannot make meaning of what they need to do, motivation to complete the task will diminish.

This theory can also apply to how we teach. We see the 'what' – the essay or spelling test or homework task. We can generally figure out the 'how' – has the student complied with the rubric? But the 'why' is not evident. Why has he clearly not put effort into the task?

We need to start with the why. We need to understand the child's 'why'. Why are they not succeeding as they should? Why do they seem to opt out in some subjects but not in others? There are so many different whys! Unless we can get to the centre of each child's Golden Circle, we will not understand how to reach them. The 'why' has a great deal to do with their *motivation* to learn, their attitude towards learning in general. Are teachers not leaders? How are we going to inspire our students to great things (or even simply to achieve a one point increase in a spelling test) if we cannot answer the 'why' questions? If we cannot get to the 'why' of their beliefs, understandings, perceptions? The 'why' inspires the student to action. I see the 'why' as Piaget's disequilibrium between assimilation and accommodation – the energy of affect. The 'why' could also be an indication that the child is ready to learn – they are able to make meaning of what they need to do, as Vygotsky suggests; they have the language to cope with the gap between what they do know and what they need to know. Those children who have a strong 'why' statement are the ones who develop resilience; are the ones who persevere and succeed, no matter the barriers they encounter. I feel Sinek's theory could be a modern interpretation of Piaget's and Vygotsky's theories of learning. All three circles represent the ZPD, with caring mentors and leaders being mindful of each circle. By starting with the 'why' we are starting with the child's prior knowledge, their understanding, their ability to make meaning of what they need to do. We are starting with their interests, with their level of understanding. We are starting with what *motivates* them to learn.

Donaldson sums it up perfectly: '…if we are not willing to try and keep trying, in the light of knowledge attained, to help our children meet the demands which we impose on them, then we must not call them stupid. We must rather call ourselves indifferent or afraid.' (Donaldson, 1979, p128). I understand we, as teachers, do take the role of motivation in learning into account to a certain extent. But it is has been my experience that we do not place enough emphasis on understanding what motivation means to the child in specific areas of learning. We may have inadvertently overlooked the importance of motivation and could possibly have dismissed the value of the role of motivation in the child's own experiences of learning. In the area of applied spelling, we may give the child the message that they can use spell check, or

get a concession for poor spelling, but if we can understand the ‘why’ for the disconnect between learned and applied spelling, we can equip the child with strategies to possibly improve the quality of their writing.

I would now like to take a look at a model of learning that has greatly influenced how I have come to understand the process of learning. It is called the Unified Learning Model.

CHAPTER 4: Learning on a neurobiological level

The model of learning reviewed in this chapter has used neurobiological science to reinvestigate the learning process and has added new information to the knowledge base regarding learning. What follows is a review of the Unified Learning Model (ULM), a model that brings together the common threads of knowledge from many different theories of learning, in order to 'explain and predict how learners in classrooms actually do behave and learn' (Shell *et al*, 2010).

Chapter 2 reviewed the literature of 2 theories of learning – those of Piaget and Vygotsky. A theory can be thought of as generalised statements of a phenomenon. A model, on the other hand, can be thought of as a tool by which to understand a specific phenomenon. The model of learning reviewed in this chapter was developed in order to understand how humans learn - specifically the kind of learning that happens in the classroom. It has drawn on "motivational, cognitive and neurobiological sciences" (Shell *et al*, 2010) to do so. The main difference between the previous theories of learning and the ULM is that the ULM highlights motivation as a key factor in the learning process, whereas the previous theories of learning, although they acknowledge motivation's importance, do not.

As this chapter reviews one particular text – *The Unified Learning Model. How Motivational, Cognitive, and Neurobiological Sciences Inform Best Teaching Practices* (Shell *et al*, 2010) - all page numbers referenced refer to this text. Any additional sources of information will be specifically referenced.

The Unified Learning Model

The Unified Learning Model (ULM) was developed by a team of six people, each one an expert in their particular field of study. There are four educational psychologists: Shell, an educational cognitive psychologist; Trainin and Wilson, both educational psychologists involved with the training of teachers and the study of strategies for effective teaching; and Kauffman, an educational psychologist who studies the effects of motivation and feedback on academic achievement and engagement. In addition, there is Brooks, a molecular chemist whose work involves developing models on a molecular level about how things that we cannot see actually work. The last member of the team is Herr, an instructional technology consultant and a

technical writer who can make a very complex research understandable for readers new to cognitive science.

I included the above introduction to the team who developed this model of learning to highlight that the Unified Learning Model (ULM) had input from experts from a range of fields involved with classroom learning, including neuroscience. Neuroscience forms the backdrop for the science behind learning, and also for the psychological aspects of learning and the things that affect effective learning.

What attracted me to the model was that it brought together all the theories I had learned about and tried to apply in the last ten years of my teaching. It filled in many of the gaps in understanding I was experiencing around the roles of working memory and motivation, and addressed and incorporated new information - such as the research done by Dweck in the field of growth / fixed mindsets and also the power of praise and feedback (Dweck, 2012). The model is simple and easy to understand. It is the only one I have come across that places such great importance on the role of working memory and motivation in learning - two aspects of learning I had come to suspect play a much more important role than previous theories of learning gave them credit for.

Shell and co-authors began by looking at what happens at the very basic level of learning - the neurological level. The brain is made up of approximately a hundred billion neurons. A neuron is the basic working unit of the brain, and is designed to pass information to other neurons, either chemically or by electrical impulses. Shell *et al* describe learning at this level as '...a relatively permanent change in a neuron' (Shell *et al*, 2010, p 7). More specifically, and on a more complex level, 'learning results when the synaptic potential of a neuron, the likelihood of a neuron transmitting an electric potential, is systematically changed' (p 7). In other words, an impulse initiated from information coming in from any one or more of the five senses, will travel along the branches of the first neuron and jump to the next one by means of a chemical or electrical impulse, thereby connecting the two neurons. Every neuron in the brain has a receiving end and an output end. The receiving end can receive impulses from one or numerous neurons, just as the output end can pass on the impulse to one or many other neurons (p 8). Once the neuron receives enough impulses, it 'fires', releasing chemical neurotransmitters, which then jump across the synapse (the space between the neurons), to the next neuron, thus

connecting them. The more often the neuron fires, the easier it becomes to fire. Each time the connected neurons fire, whether in sequence or at the same time, their connections become stronger. Each of the five senses has a specific part of the brain that responds to information received from the relevant sense. This information is sent directly to *working memory* (to be explained further on). Working memory does not have a specific part of the brain allocated to it - it seems to be an area of the prefrontal cortex (p 11). There is a great deal of sensory input in any one moment with which the working memory has to contend. As a result, its primary function is to decide which of the input to deal with and which it can ignore. Shell *et al* call this decision-making process *attention* (p 11). Input that has been attended to activates neurons in a temporary memory area and creates a neural representation of that input in working memory. This representation is kept active over a few hours by a process called long-term potentiation (p 11). This ensures it does not disappear. If this neural pattern does not disappear, it will form a permanent memory trace, thus changing the neural patterns and connections. When a similar input occurs, working memory 'recognises' it, or matches it to what it has encountered before. When this happens often enough, the time to 'recognise' the input gets faster and faster. The ability to pay attention will affect how efficiently working memory can recognise the input.

Sometimes, two sensory inputs will be in working memory simultaneously when they are being attended to. They will then be stored as a single pattern. Later, when only one input is matched, both will be retrieved as they were both stored together. By recognising a picture of a cat, the link to a cat being an animal will also be retrieved. This linking of sensory inputs can result in numerous patterns being linked, any one input activating the links to the others. This is how we build *knowledge*. As you will be able to see, no learning can take place without working memory - it is central to everything. But it is not unlimited. Shell *et al* state that working memory can only queue up very few inputs at once - in fact, they believe only four are possible. In addition to this, it can only attend to *one* thing at a time. Thus, there is the potential for working memory to 'forget' or 'ignore' a lot of what is coming in through our senses if meaningful connections have not been made and stored in long term memory. The ULM is concerned mainly with understanding the capacity limits of working memory, as well as how these affect learning and teaching.

One other phenomenon the ULM considers important in order for learning to happen is *motivation* (to be looked at in detail further on). According to Shell *et al,* the brain areas

associated with working memory are closely connected to those associated with our emotions (p 13). This means that whatever we are feeling at the time of laying down new neural pathways will be associated with them. When anything activates that particular memory, the feelings around that will be activated too. In addition to this, these emotional influences will affect the amount of attention we give to the new inputs, and so will dictate how much working memory capacity will be given to this new learning. Attention takes effort. If it is something that is related to a bad experience, for example, we will tend not to allocate too much attention to it, which in turn will limit the working memory capacity.

To sum up how learning happens according to the ULM, Shell *et al* have outlined three *concepts* of learning that are connected by three *principles* of learning. The authors then outline five *rules* of learning that underlie all classroom learning. The three concepts of learning are (p 2):

1. Working memory. This is central to learning. It is a temporary storage space and is the key to understanding learning. Because it has a limited capacity to hold onto information, it dictates *how* learning happens. It dictates which teaching methods and techniques will help or hinder it. Working memory allocation is affected by attention. This rule incorporates both Piaget and Vygotsky's notions of memory and how learning happens (see Chapter 2). Alloway (2011) argues that working memory '...is a better predictor of academic success than IQ because it measures a student's potential to learn, not what they have already learned' (p 15)
2. Knowledge. The goal of any learning experience is knowledge. The purpose of learning is to increase all facets of knowledge. Prior knowledge has an impact on future learning and affects *how* working memory operates. Knowledge is also the outcome of working memory. It is therefore a process AND a product of working memory (p 2). I will cover this concept in more detail further on.
3. Motivation. This is the 'impetus for directing working memory to a task' (p 3) – Piaget's 'energy' to assimilate and accommodate knowledge (see Figure 2). It plays a pivotal role in allocating working memory to a task. Poor motivation for a task can lead to very little working memory being allocated, which results in ineffectual or incomplete learning. This is the crux of my study.

Shell and Associates state that their model is a simplified integration of what is known around classroom learning. They have condensed their research into working memory, knowledge and motivation and connected them in the following *principles* of learning, which are embedded in the ULM (p 3):

i. Learning is a product of working memory allocation.
ii. Working memory's capacity for allocation is affected by prior knowledge.
iii. Working memory allocation is directed by motivation.

The roles the concepts of working memory, knowledge and motivation play in learning are summed up into the five *rules* of learning (p 14):

1. "New learning requires attention" (p 14). Nothing is stored in long term memory without going through working memory. Therefore, we, as teachers, have to understand that children need to 'attend' to the task in order to learn the information.
2. "Learning requires repetition" (p 14). In order to make those neural pathways strong, children need many opportunities to practise when they learn. In order to make a memory a vital piece of knowledge, it needs to be matched and retrieved from long term memory often. It is a case of use it or lose it.
3. "Learning is about connections" (p 14). Basically, whatever is stored together will stay together, and whatever is retrieved together will also stay together (p 14).
4. "Some learning is effortless; some requires effort" (p 15). School learning is often about deliberate learning - learning specific skills and information. This will take effort and will be difficult. How hard we have to work at learning something (the amount of effort we have to exert) dictates how much attention and motivation we give to a task, which ultimately affects working memory capacity.
5. "Learning is learning" (p 15). All neurons learn the same way. However not all *students* learn the same way - different things motivate them differently, and students' prior knowledge affects learning to different degrees. Different teaching and instructional methods will also affect learning. But the ULM asserts that '...at the level of the neuron, human learning is human learning' (p 15).

By understanding these rules, and adapting our teaching methods, we will be able to understand that. '...teaching and instruction work when they create conditions that ultimately trigger these neural learning mechanisms in student' (p 16).

I will refer back to these concepts, principles and rules throughout the review as they apply to classroom learning and the research questions.

I will now look at each of the three concepts in more detail.

Working memory

All sensory input goes first to working memory. Although there does not seem to be a physical section of the brain where this happens, as there are for speech and vision (p 11), it seems that working memory uses some areas of the prefrontal cortex. That means in order for learning to happen, and for memories or knowledge to be stored, the information needs to have a place in the brain where it can be stored long term - it cannot happen in working memory. In order to retain information from the senses, working memory has to attend to (give attention to) the most significant inputs, while disregarding other inputs that are not relevant. This requires focused attention. The sensory input arrives in working memory and creates a neural representation (p 11). If this does not decay due to inappropriate attention, or to interrupted attention, it will form a neural pattern (p11). Working memory is able to then "recognise" that you may have attended to something similar in the past and is able to fire up that previously-stored neural pattern. In other words, it retrieves these stored neural patterns. This forms a *memory trace,* and if these are activated often, it leads to a neural connection - a change in the firing ability of the neurons, which then creates a permanent trace in long term memory. According to the ULM, this constitutes knowledge (p 12). This process of matching and retrieving answers the question "Where have I seen this before?" For my research this is critical when learning to spell, as the student needs to be able to match the letter's shape and sound, and also its sound and the way the letter is written. This principle also applies to the way in which letters combine to make blends (/st/), digraphs (/ai/ says long /a/ as in "gain") and, ultimately, words. The whole process of matching and retrieving is called *spreading activation* (p 12). This forms the many ways in which information and knowledge is linked. Spreading activation illustrates Piaget's concept of building increasingly sophisticated knowledge schemata (see Chapter 2, Piaget, Knowledge). The acquisition of knowledge, then, can be

defined as turning a specific sensory input into a permanent trace, which is then linked to many other permanent traces. Meaningful learning happens when an increase in the number of "recognitions" increases the number of connections made. In future learning, any one of the related sensory inputs will then be able to activate this vast network of connections (p 12). In other words, practise is essential to all meaningful learning. But it needs to be purposeful practise - that is, relevant in content and ability level for the student.

Spelling activities need to activate these vast networks in order for the student to recognise and apply correct spelling to his writing. Simply learning lists of words will not be sufficient. The student needs to be able to link many different kinds of inputs, such as different meanings (for example the word "jam" can mean the spread, a stuck door, a music session, a difficult situation), the many connections the word may have to other ideas ("jam" can be connected to toast, scones, fruit, cooking etc), knowing the sounds /j/ and /am/ make, linking the /am/ sound to other words (Sam, ham) to name just a few. Any ONE of these inputs will be able to link to the vast networks of permanent traces laid down during previous activities, and retrieve the necessary knowledge needed to complete the task in which he is involved.

The importance of the role of working memory in learning cannot be underestimated. The ULM states "learning doesn't happen without working memory" (p 13). In a classroom situation, it is critical for the teacher to keep this in mind. The student's ability to attend to the sensory inputs (the student's focused attention) will affect how their working memory will deal with these inputs.

Research has shown that working memory is also linked to many other areas of the brain and has "...substantial connections" (p 13) to those areas associated with emotions. This means that working memory is affected by the input from our emotions, as well as from any other sensory input. We have seen how meaningful learning needs focused attention in order for working memory to operate optimally. However, attention requires effort on the part of the student. If they are interested and engaged with the task, applying and keeping their attention focus on the task is easy. However, when they find something is hard to do, it is more difficult to keep their attention focused on the task. The negative emotions of frustration (the inability to achieve a task because either there is no prior knowledge on which to draw, or the task is too difficult for the child – see Chapter 2, Vygotsky, Knowledge) or possibly the feeling of failure to achieve

what they feel they need to, affect attention and therefore will affect the amount of working memory capacity that will be allocated to the task.

This will have significant implications for those students who appear to be poor spellers. If the student has experienced difficulty or repeated failure in learning to spell, or applying their spelling, they will be less and less inclined to put in the required effort needed to become a competent speller. Their *motivation* levels when spelling will be very low. According to the ULM, "motivation is the psychological construct that is used to describe those things that impel and sustain us in putting forth effort" (p 13). Motivation is thus directed by the emotions and by any other experience, either good or bad, connected to something such as spelling. It can become a cycle of poor performance leading to negative emotions, leading to poor results, leading to poor performance and so on…

Working memory capacity

Most models of working memory seem to agree that it has two functions: the first is to hold all aspects of a task together, whether they come from sensory inputs or by retrieving information from long term memory; the second is to manipulate, or process, this information by attending to it (giving it attention) in order to change it in some way (p 19). George Miller (1956, as cited in Shell et al, 2010, p 19) seemed to think working memory could hold about 7 elements in its temporary storage at any one time, but research done by Shell *et al* have narrowed it down to four. They believe that this capacity is a function of span (the *absolute* number of elements a person can hold in temporary storage) and processing speed (the speed at which the person is able to think about and manipulate the elements in this storage before it decays and disappears or is replaced) (p 20). Therefore, working memory capacity can be limited by there being no more space to accommodate new sensory inputs (all four slots are occupied), or by the person not being able to think about, or process, the information held in temporary storage quickly enough. This second limitation is evident in the classroom when a teacher calls on a student to answer a question, but they 'freeze' and cannot give the answer, although they do know it. Given time to think, they might well be able to answer the question correctly.

The act of processing is the ability to combine the temporarily-stored elements that are coming in from the senses, either on their own or by retrieving knowledge from long term memory. As learning is all about making connections, the processing *capacity* will determine how many simultaneous connections can be made between the temporarily-stored elements and to change

them into something new. The quicker this can happen, the quicker the student will learn, and therefore the easier the task will seem. This, in turn, will attach feelings of success and confidence, and the student will be more motivated to attempt similar tasks in the future (more on motivation to follow). The four-element limit to working memory, then, seems to be the capacity for attending to and processing the temporarily-stored items (p 20). Children who have a poor processing speed, such as those who have been diagnosed with dyslexia (DSM-4)[4], will struggle to link the letter and its sound to their prior knowledge fast enough in order to be able to read and spell efficiently.

Although all sensory inputs come into working memory first, not all of them can be saved (p 20). According to Shell *et al*, it appears that they get sorted immediately, based on novelty (any new sensations or patterns) and saliency (the strength of the input, such as a loud noise) (p 20). Once in temporary storage, it is the processing component that dictates what will happen to it. Every second of every day, we are receiving sensory inputs. If unchecked, they would simply flow in and out of working memory, no permanent traces would be created, and we would learn nothing. Attention, or the ability to attend to a specific element, stops this flow and blocks any new input from taking its place. If attention is holding on to one or two elements, there are still two more slots that are free for inputs to occupy. If, however, attention is holding on to four elements, all available space is taken up in working memory, and all other sensory inputs would be blocked. An example of this state is when we are engrossed in reading a book, and we do not notice it has begun to rain, or that before we know it, many hours have passed without us noticing. Texting and driving is another example - although we can drive almost by instinct and so it takes up few working memory slots, texting requires all four slots. We then do not focus on *any* part of driving, and accidents happen.

However, recent research has discovered a 'buffer area' in working memory (Koechlin & Hyafil, 2007, as cited in Shell *et al*, 2010, p 21). This is an area where the elements being held in temporary storage can be moved for a short time while working memory attends to some new input. It is believed that working memory can switch between the temporary memory and the buffer area (p 210). For example, in the classroom situation, students may be engaged with a specific task. If the new information is low level, such as a soft rustle of paper, the student is

[4] The DSM-4 has been replaced by the DSM-5, which incorporates the term dyslexia under the general term Specific Learning Disorder (see Chapter 1, Physiological Impairments)

able to acknowledge it but turn back to the task. If, however, the new input is loud, such as the starting up of a lawn mower, the student may give too much attention to the new input which may cause them to "lose" the information in the buffer area. This is called 'losing your train of thought'. We have all experienced this - for example, walking to the kitchen to fetch something, then begin thinking about what needs to be done tomorrow. By the time we get to the kitchen, we have forgotten what we were there to fetch.

This chain of processes – 'sensory input, attention, redirection of the sense, new sensory input, continued attention, new redirection of the sense, and so on…' is termed concentration (p 21). Concentration has a powerful ability to block all other sensory inputs. We can see this in the classroom when a student is so totally focused on what they are doing that they do not hear the teacher repeatedly call their name. Piaget refers to this concept of concentration as 'attention', Vygotsky as 'focused attention' (see Chapter 2).

Working memory does not only deal with incoming sensory inputs. It also activates and retrieves information from long term memory. In fact, our ability to make use of our prior knowledge and past experiences is heavily dependent on working memory activating our long-term memory. Otherwise, everything would be new, and we would not be able to identify patterns, nor would we be able to link our knowledge. No learning would happen. The initial pattern match not only triggers the same connections that working memory has already made and stored in long term memory, but it also activates everything else that has a connection to it. Working memory's role of linking our inner and outer worlds (p 22) is one of the main concepts that helped fill in some of the gaps I was experiencing in understanding how learning happens. I had known that working memory was important, as I understood it to be the place where all the elements of a task came together and were manipulated in order to produce an outcome such as a sentence or solve a problem, but I had not truly understood the importance of it being the pivotal link between our external sensory inputs and our inner store of knowledge. It is the trigger that fires all connections. An understanding of working memory and its role in learning became the most important thing I, as a teacher, needed to know. I felt that no amount of careful lesson planning was going to be effective if working memory was not given its due consideration. I now understand *why* pattern matching (and bringing prior knowledge to the fore) is a better focal point to start a spelling lesson than simply finding a topic the student is interested in. However, it must be noted that topics of interest are still an important element of the activity. A subtle change in thinking, but one that has made a big

difference to the way I view lesson planning. “Pattern matching is the basic mechanism of working memory and long-term memory interaction” (p 22).

One of the things I had wondered about when learning about working memory was if it was possible to increase working memory’s capacity. The ULM says it is. This can be done by considering the nature of each of the elements in temporary storage (p 27). The ULM states that the elements in storage can be variable. For example, we now know that temporary memory can hold four elements. This can be four letters, or it can be four words which would add up to more than four letters. Shell *et al* refer to these variable elements as chunks (p 27). A chunk is “... a connected grouping of knowledge” (p 27). A chunk can be a small group of connected information, or it can be large. The ULM incorporates both Piaget’s and Vygotsky’s notions of schemata, or systems of knowledge, into the term ‘chunks’. Thus, chunks of information can expand working memory’s capacity significantly. Being able to activate chunks of knowledge has a very positive effect on the span and effectiveness of working memory processing (p28). This tells us that working memory’s capacity is not fixed. So, although we only have four slots, the capacity of each slot can increase as a result of chunking. This will have a significant impact on how a young student learns how to spell and how to apply it: the more experience of the words they get, and the more opportunities they have to practise spelling, together with many opportunities to practise using the words they get, the bigger the chunks of information they can draw on when confronted with a challenging word to spell. The bigger their chunks of knowledge, the better their chance of spelling the word correctly.

Working memory allocation

The first principle of learning states that “learning is a product of working memory allocation” (p 22). In this model of learning, Shell *et al* combine the two components of working memory, namely the temporary storage of information and the processing thereof, into the framework of “allocation” (p 22). So, for working memory to be allocated, slots must be available for either the new input or retrieval of information from long term memory *and* attention (or processing) must be directed at the information in these slots. According to the ULM, if working memory processing attends to new information being held in temporary storage, it is more likely that this activity will increase the synaptic strength of the neural connections, and the new information will be placed in long term memory (p 26).

As far as working memory allocation goes, we can link the first principle of learning and the first three rules of learning, embedded in the ULM to spelling:

Principle one states, “learning is a product of working memory allocation” (p 3). The first way this happens is by giving attention to the input/s. Each slot in working memory needs to be available for the sensory input to be attended to, or for information to be retrieved from long term memory. In addition to this, attention has to be directed to the information in the slots. As far as spelling goes, this means that in order to learn how to spell, and then how to apply the correct spelling, the student needs to have focused attention when learning the sound-letter-writing connections, when listening to instructions (about spelling rules, for example), or when doing the practice activities. This then links to the first rule of learning: “new learning requires attention” (p 14). According to Shell *et al*, if something in working memory is given attention, it is more likely to be placed in long term potentiation, and then into long term memory (p 23).

Rule number two states: “learning requires repetition” (p 14). Information that is repeatedly given attention will be stored in long term memory. Shell *et al* are unsure of exactly how this happens, but they are convinced that practice does create long term memories (p 24). The more the neural pathways are activated, the stronger they become and the more easily the child can access their knowledge. This kind of repeated practice is also the basis of rote learning. Rote learning has its place in the classroom, but it cannot be the only way to learn as it does not generate the connections to other similar contexts, nor does it incorporate meaning into the practice. Learning in order to apply knowledge needs to have a variety of links. Repetition does not have to take the form of continuous practise in a single task. Practise can take place over a few days, linking the information in different contexts. For example, spelling words can be learned on Monday, their meanings and uses explored on Tuesday, used in simple sentences on Wednesday, used in a piece of creative writing on Thursday and possibly be linked to the theme in another subject the following week. As long as the information is brought back to working memory often, and on a daily basis, it is stored in long term memory. Finally, repetition over an extended period of time helps strengthen the firing potential of the neurons within the neural network. It leads to increased connections and faster retrievals, and also helps to recall the information more accurately (p 25).

How this translates to learning to spell could be laid out in the many ways in which a word could be learned. For example, the student is first introduced to the word. Over the next few

days they may be asked to look at the word; break it down into its different sound components; look at any connections it may have to their own knowledge; look at any different meanings it may have; they can see it, then hear it, then write it; they can then find it within a relevant text; they can use it in creative writing; they can explore the definition/s and asked to write the word. In this way, they say the word, hear the word and write the word repeatedly, thus strengthening their own long-term knowledge of the word using visual, auditory and contextual cues to pattern match and retrieve the information accurately.

The third rule of learning also falls within this principle of learning being a product of the amount of working memory being allocated, namely "learning is about connections" (p 14). Working memory does not only attend to the information in its four slots, but it also processes it. It retrieves the information and holds it up against the new input. By putting information into their own words, the student will remember it better. By processing information, the student learns to make their own links, and therefore is able to apply their knowledge to different situations. This would apply to spelling where the student links the word with their own prior knowledge, then uses it within a different or new context, such as a piece of creative writing. This kind of processing is different to rote learning, where the same information is repeated often, but in the same pattern.

As processing is about connecting things in new or different ways, working memory can also break down existing connections (p 26). This is an important ability as young children often experiment when learning to spell and can "teach" themselves the incorrect spelling of a word - for example, a young speller may write "when" as "wen". This pattern can be corrected by learning the correct spelling at a later stage.

As working memory processing creates new connections, it is also able to allow working memory allocation to connect the new information to the student's prior knowledge. In this way, working memory allocation forms ever-bigger networks of integrated knowledge (p 26). This is integral to increasing working memory's capacity.

It is important to understand that we all have control over our own working memory allocations if we are aware of how it all works. I feel it is vital that students, even young 9- and 10-year old boys, are made aware of working memory and its role in learning. Young students do not have to know all the science behind it, or the intricate details, but they can certainly be taught

to answer the question “Where have I seen this before?”. This would be the start to developing pattern matching strategies.

Shell and co-authors sum up working memory by reducing its actions to the following basic rules of working memory (Shell *et al*, 2010, p 29):

- Storage rules:
    - “If something in working memory is attended to, store it in long-term memory (the attention effect)” (p 29). This would mean that for a student to pay attention to the task, spelling activities would need to be relevant (hold their interest), have a certain amount of novelty and follow a similar pattern each time.
    - “If something is in working memory for multiple cycles, store it in long-term memory (the repetition/rehearsal effect)” (p 29). When teaching spelling, the teacher needs to be aware of allowing the student many, varied opportunities to practise the spelling. It would have to include visual and auditory activities, as well as many opportunities to write the words in meaningful tasks - such as using the words to create a short story. Simply writing the words as a list does not create sufficiently strong connections to prior knowledge.
    - “If something in working memory is processed, store it in long-term memory (the levels of processing effect)” (p 29). This would mean the student would need to use the word/s on many different levels. For example, breaking the word down into its sound components; looking at any other meanings it may have; looking at the connections in the student’s own life it may have; finding synonyms and antonyms; and using the word in a sentence and possibly a story. In other words, the student needs to be able to play with the word and try things out for themselves.
    - “If things are in working memory together, store them together in long-term memory (the connection or association effect)” (p 29). In just the same way as the previous rule would be used, so the student would need to make as many connections as possible, in every activity they did, in order for the spelling to be remembered.
- Retrieval rules:
    - “If something in working memory is the same as something in long-term memory, retrieve the long-term memory contents (the pattern matching effect)”

(p 30). By making many and varied connections, any one of them could trigger the connection to the correct spelling of a word. By asking the question "where have I seen this before?" the student will be developing habits that can help not only with spelling, but in other academic areas as well.

Knowledge

Knowledge is the second key concept of the ULM. Knowledge is defined as "...everything we know or can do that is stored in the neurons in our long-term memory" (p 33). Shell *et al* admit that they do not know as much about the actual neurobiology of knowledge as they do about the way in which working memory works, or how the basic sensory and motor operation processes work (p 33). However, they have drawn on the work done by using neural net models in order to better understand how learning happens at a neural level. These models have been developed to help understand what happens to the neurons as they strengthen, weaken and connect in the learning process. The knowledge of how these neural nets work is beyond the scope of this research project. The reason I have included mention of them here is to confirm that the ULM is anchored in science and neurobiology.

Shell *et al* argue that "knowledge exists if it has been stored" (p 34) but its permanency depends on *how* it has been stored. The ULM says knowledge will always be stored as chunks of information. Every sensory input experienced does not get represented by only one neuron - it will always be associated with other inputs, such as emotions, taste, smell etc. (p 34). The more chance of these connected neurons firing through pattern matching or retrieval, the more chance that chunk has of being stored permanently. If emotions have been connected to the chunk of knowledge, it can be retrieved many years later. This connection to emotions is an important detail to remember when understanding how a student learns, as any negative emotions attached to learning certain subjects (such a spelling) will definitely have a detrimental effect on how effectively they learn that subject. It has been my experience that many of the boys I have taught are able to spell (that is, they do not have any known biological reason not to be able to spell, such as delayed processing speeds), but their attitude to, and emotions around, spelling have not been positive. I have not been able to fully understand these negative attitudes to spelling as yet, hence this research project to find out what does motivate / demotivate young boys with regard to learning to spell, and their inability (reluctance) to apply their knowledge.

The way in which we are able to change the neurons, and therefore learn something, is stated in the second rule of learning - that is, by repetition (p 34). Initially, the neurons fire when a pattern match occurs in working memory, and repetition occurs by repeated retrieval of that knowledge chunk that was generated by that pattern match. Retrieval needs to take place often if we want the knowledge chunk's firing potential to be strengthened. It is a case of "use it or lose it". The pattern match does not have to be a perfect match but can simply be the pattern that best matches the sensory input. "Best" means "...the strengths of the firing potential in the chunks that most closely match" (p 35). The more chunks that are created by effective learning, the more chance the input has of being matched, and therefore retrieved. Again, this is important to remember in the case of spelling - if the word is learned using many different methods (for example by: breaking down the sounds in the words; thinking about the different meanings or connections; using it in writing; hearing it pronounced; seeing it in many contexts etc), the better the chances are the student will remember the correct spelling. Many students will need more time to achieve this than those who find spelling easy.

In the ULM, chunks are unitary - they are single entities (p 35). There are, however, different sizes of chunks. Some can be very large, such as our understanding of what a cat is, as opposed to smaller chunks such as simply being able to identify a cat from an image. The larger chunks are often thought of as concepts (p 35). They are, however, still regarded as a single thing. The idea of unitary chunks of knowledge becoming increasingly sophisticated is consistent with the notions of how knowledge gets built up, linked and consolidated according to both Piaget (assimilation and accommodation) and Vygotsky (sign operations) (see Chapter 2). Connections can be made between these chunk units, and this is what classroom learning is all about. For example, a student may be learning how to spell the word "bowl". While thinking about it, they may think about bowling a ball. They then go on to think about their last cricket game, and the party that happened afterwards, and the orange jelly they ate. They then connect the orange to being a fruit, and think about the bowl of fruit in their kitchen at home. The child then remembers they have a swimming lesson when they get home. The links between thoughts are endless. These large connections between similar unitary chunks are often referred to as 'schemas' (p 36). It is easy to see why a young student can get 'lost in thought' when they do not concentrate on the task or cannot attend to the inputs already in their working memory slots!

There are different kinds of memory, or knowledge. The ULM model once again draws together Piaget's (Furth, 1969) and Vygotsky's (Vygotsky, 1978) theories of what constitutes knowledge. The first kind of knowledge the ULM mentions is *episodic knowledge* (p 36). This is all the knowledge we have about our own lives. This is often easy to learn, as it does not require any effort - it just happens. This reflects the fourth rule of learning, namely, some learning is effortless, some requires effort. The knowledge associated with episodic memory is effortless because it is attended to in working memory automatically - we are not even conscious it is happening (p 36). However, it can be very detailed in that it may attach very specific aspects of the sensory input such as taste, smell and sound. Think about a specific song you hear that takes you back to your teenage years - it may even be a specific time and place. It can also be connected to a specific emotion such as fear or anxiety. However, we can quickly lose the details of the original event, although we can reconstruct it from the general schema of our lives. Episodic memory can be connected to a specific time or environment, such as Mrs Green's English class when the results of the first spelling test were received. If a strong emotion such as a sense of failure or embarrassment or belittlement was experienced, this could affect the way in which the student will relate to spelling in the future.

Episodic memories (knowledge) seem to be short-lived. Although they are attended to in working memory, and so can form chunks, these chunks are not repeated, so will soon be lost. We can remember what we did yesterday, but can we remember what we did on this day a week ago? A month ago? A year ago? Not likely. Episodic knowledge relies on our general schema of our lives (p 38), and we use these to reconstruct our recollection of what has happened to us.

The second kind of knowledge is called *semantic knowledge* (p 38). This is the kind of knowledge associated with school learning. It is all the knowledge we have that is not episodic - i.e. it has nothing to say about us. Unlike episodic knowledge, it does not happen automatically. We must consciously attend to it, and so it requires effort to learn it on our part.

As Shell *et al* state, "...learning episodic knowledge is effortless, but learning semantic knowledge requires effort" (p 39). This links to rule number four - "some learning is effortless, some requires effort" (p 14). Building semantic knowledge often starts off as a single piece of information, and then builds up to form large chunks, concepts and schema. Semantic knowledge *starts* with a personal experience, such as sitting in class listening to the teacher

explain addition or a new spelling sound. The episodic memory (how the student is feeling at the time, or how he experiences this situation), whether good or bad, will therefore be attached to this chunk of semantic knowledge. Should they experience a negative emotion (episodic memory) around the situation at the time, the connection between the episodic and semantic knowledge could lead a student to believe they are not good at Maths or spelling or History.

It has often been my experience with spelling that the student *can* spell - they *can* identify and write the different letter-sound combinations - but they have come to believe they are "a poor speller" as they may not be able to it as quickly as their peers or recall the words as accurately as they should. Thus, because this kind of knowledge requires effort, it is closely linked to motivation. This is one of the key areas to look at in order to understand why so many capable young boys disengage with spelling at an early age. I will look at this in the next section.

Semantic knowledge, the knowledge we are concerned with at school level, can be divided into two different kinds of knowledge - *declarative* (the knowledge that / what - facts, concepts and schema) and *procedural* (the knowledge how - i.e. behaviour that can be seen in movement as well as in the sense of cognitive thinking) (p 39).

Declarative knowledge can be divided into two different types of knowledge. The first is *objective knowledge* (p 39). This is the "...long-term representation of sensory input" (p 40). The accuracy of this kind of knowledge depends on how well we have stored the information. Rote memory is an example of objective knowledge. However, this can be unreliable - Shell and co-authors talk about "eyewitness" testimonies, and how they can differ with time, or can be manipulated by outside influences (as lawyers can do to witnesses in court). Spelling is an area of school learning where it is vital the student has a clear and very accurate representation of the word in memory in order to write it accurately. This means the teaching of spelling needs to be explicit, with the tasks having a clear goal.

The second type of declarative knowledge is called *symbolic knowledge* (p 40). This kind of knowledge includes the deeper aspects of language such as meaning of words. It also includes our moral codes, our values, our interpretations of our world around us and our knowledge of specific subjects such as Maths, Physics or Biology. Most of this kind of knowledge comes through our senses initially, but it is all still based on the symbol systems we have within our societies (similar to Vygotsky's sociocultural theory of learning). The meanings conveyed by

words, pictures or even observations are all linked to our particular symbol system - particularly our language system (p 40).

Both declarative (and, by definition, objective and symbolic knowledge) and procedural knowledge adhere to the first three rules of learning - all new learning requires attention, repetition and connections (p 14). Shell *et al* see the basic unit of declarative knowledge as a chunk (p 40).

Chunks of knowledge (both episodic and semantic) are built up and strengthened by repeated pattern matching and retrieval. The accuracy of the knowledge depends on the frequency with which these matches are made, and the information is retrieved. It is a game of numbers (p 41). For example, many students spell "with" as "whith" or "withe". The more practise the student has with the *correct* spelling (tasks, reading etc), the more that spelling is strengthened. The other two versions, because of the decreasing frequency with which the student uses it, will eventually fade and disappear. The objective knowledge will have an accurate representation of the word "with" which is practised over and over, and eventually they will use the correct symbols (letters and meaning) to write it. These knowledge chunks need time and repetition in order to connect and develop. However, many classrooms do not have this kind of time, as teachers are under pressure to complete curriculums in all subjects, and it has been my experience that spelling is often not as important a priority as Maths or English. The main goal of creating declarative knowledge is to create these connected chunks of information. Declarative knowledge allows us to engage in many cognitive actions - recognising things through matching or finding differences, classifying things, and enabling us to make judgements.

The next kind of knowledge that makes up semantic knowledge is slightly different. It is known as *procedural* knowledge and is responsible for producing an action (p 41). An "action" could be a physical response, or thought. It could also include retrieval of long term knowledge. It is "...purposeful and goal directed" (p 43). It is "knowledge how" - the answer to "if...then" (p 43). The ULM sees procedural knowledge as the way in which declarative knowledge is put into use. Like declarative knowledge, procedural knowledge is learned through attention and repetition to form a chunk of information. But in addition to this, procedural knowledge has an action attached to it (p 45). So what we want students to do in a classroom setting is to create "chains of action" (p 45) that will help them problem-solve or look for creative solutions to the

tasks they are set. We want them to strengthen those connections that result in success, whether it is finding an answer in Maths or applying their knowledge of natural disasters to one specific disaster. In spelling, we want students to be able to make an informed decision as to which spelling of the long /a/ sound is the correct one to spell "plane" (meaning the flying machine). Is it /ay/, /ai/, a_e/ or possibly /ey/ (as in "they")? The more complex the problem, the longer the chain of information as the student searches for pattern matches that could help solve the problem. The more the chain is successful, the stronger *all* the links will be that were used. There is, however, a downside to this kind of reinforcement, which can be seen in students' spelling. If the incorrect method of spelling a word has been strengthened through unchecked repetition and use of the word, that particular chain will be very difficult to break. It can also be seen in reading, where the young reader uses the pictures to "guess" what a word may be. Using the pictures as clues is one of the principles behind the whole language approach to learning to read (see Chapter 5, p 103). When they come to reading books without pictures, they will struggle. Miscues in reading are the result of the student guessing an unfamiliar word by only looking at the first letter / letters of a word. This action has obviously helped the student in the past, but they have not realised it cannot apply to all situations where they need to decode a word. The child would need to learn a more effective stimulus-action procedure in order to read words accurately.

Shell *et al* call this action of constantly looking for and strengthening the best possible action in response to a certain condition, *practise* (p 47). They believe that explicitly teaching the correct action from the start is the best way of ensuring the student retrieves and strengthens those chunks and chains of knowledge that will eventually become accurate declarative and procedural knowledge, to be stored in long term memory (p 47).

In order to better understand how the different kinds of knowledge fit together, I have outlined a summary of the kinds of knowledge the ULM acknowledges:

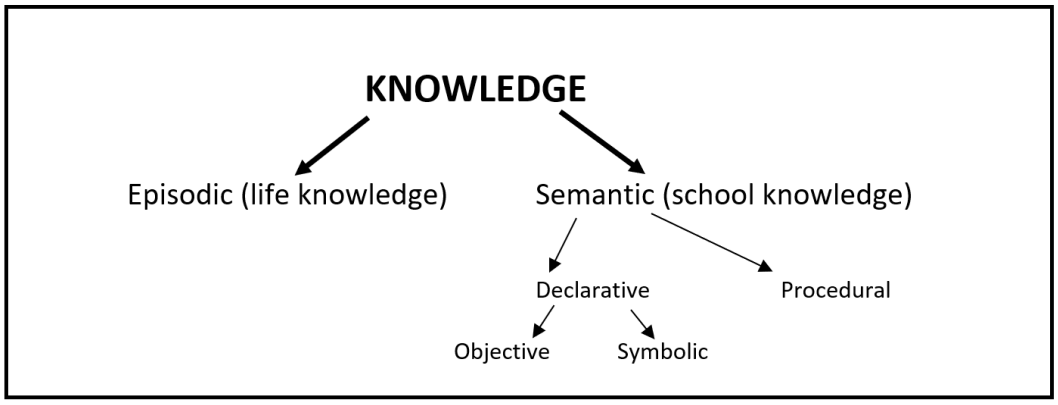


Figure 6 - A summary of the different kinds of knowledge according to the ULM

An understanding of how of learning happens would not be complete without understanding automaticity, application (or transfer) of knowledge, incidental learning and problem solving (or critical thinking).

According to the ULM, the "...ultimate goal of procedural learning is automaticity" (p 47). This is when knowledge is retrieved without a conscious input from working memory. It is something we do without thinking - an action (the knowledge "how" to do something) in direct response to a stimulus. As previously discussed, the first rule of learning states that all "new learning requires attention" (p 14). This means that when learning something new, the working memory is actively involved in pattern matching and retrieving knowledge. This can be relatively slow. It has also been shown that the more something is practised, the faster the retrieval time will be. At some point in time, the retrieval of this information is so quick, that it, and its associated chains and links, no longer need to be controlled by working memory (p 48). This "automisation" frees up slots in working memory, and the student is able to work faster, and with more complex situations. This is crucial for spelling and reading. One of the problems experienced by young students is that their knowledge of the letter-sound correspondence has not become automatic by the time they are expected to read. This means they will take longer to build up or decode words. Because the slots in working memory are filled with trying to match and retrieve this knowledge, reading becomes a struggle, and comprehension is lost. Students with this kind of problem will also find written spelling difficult as their rate of retrieval is slow, and writing becomes laborious. Many students would

rather opt for simpler words, or rush through a writing activity just to get it done. Some students may avoid writing altogether. It is difficult to correct a procedure (such as spelling a word) once it has become automatic, and the student will have to "deautomatise" it (p 48). That means bringing it back into conscious working memory in order to make new connections. This requires effort on the student's part, and in some cases, it may just be too much effort. With spelling, the aim is to make as many words automatic as possible. The more words that are automatic, the better the writing and the better the fluency of reading. Working memory slots can be allocated to keeping meaning in mind, or the construction of the sentence, or holding the question in mind while the student writes his answer.

Transfer of knowledge

So how does the ULM explain the transfer of knowledge? Shell and co-authors believe that the ability of the brain to make complex connections is key to the ability to transfer knowledge to real life situations (p 51). That means some part of the new situation has to trigger a pattern match to the knowledge that is needed. In the case of spelling an unfamiliar word, this would mean that at least the sound of the word would need to trigger any knowledge the student has of the combinations of letters those sounds must have. They will then be able to make an informed guess as to what the spelling might be. This can be seen in the way young children phonetically spell words they do not know yet - 'boy' could be spelt 'boi'; 'they' could be spelt 'thay'. Whichever way the child spells the word, it will be by applying what they remember about those sounds. For older children, it may mean remembering the root word or the origin of the word. It may mean drawing on their knowledge of prefixes and suffixes, or even of spelling rules (for example, "/i/ before /e/ except after /c/).

It has been my experience (and I have used this logic myself on many occasions) that teachers often teach a concept, but embed other information, hoping the student will learn it "incidentally" – i.e. the student will construct his own knowledge from the activity. The ULM says this is a dangerous thing to rely on. In accordance with the first rule of learning, new learning requires attention (p 14). If the new information is taken into working memory, it will leave a memory trace, and, with repetition, it will go into long-term potentiation. In addition, according to the second rule of learning (p 14), it will need repeated retrieval and repetition in order to strengthen connections and become knowledge. Knowledge that is left to be incidentally learned may not receive enough repetition. Spelling is such knowledge. It must be

explicitly taught (Furth, 1969) and be given many opportunities to practise it (Piaget; see Chapter 2, p30; Vygotsky; see Chapter 2, p37).

Problem solving and critical thinking is the ability to "...retrieve knowledge in situations that have never been encountered before…" (p 53). As mentioned above, this means that something in the new situation has to match with some part of a declarative chunk or a procedural chain. The student will keep trying until such a match is made. The constant matching and retrieving requires effort on many occasions and may be daunting to students who have experienced failure before, who have "learned helplessness" (where all problems are ironed out for the student, or options and answers given) or who do not access their knowledge quickly enough.

Summary

The concepts developed around knowledge and its acquisition within the ULM, incorporate concepts posited by both Piaget and Vygotsky, and are summarised as follows (p 62):

- Repetition - the more a chunk or chain of knowledge is retrieved, the stronger it gets.
- Spreading activation - if a single chunk of knowledge is retrieved, *everything* connected to it will be retrieved as well as strengthened.
- Building chunks - if the information in working memory matches a chunk of knowledge, it will be strengthened. If not, it will be weakened and may decay or disappear altogether.
- Episodic knowledge is easy to learn, semantic knowledge is not. It requires effort.
- Practise - if the action is successful, it's connection to the knowledge will be strengthened. If it is unsuccessful, the connection will be lost or inhibited.
- Working memory's capacity for allocation is affected by prior knowledge. This includes abilities such as automaticity.
  Any active, stored knowledge will be accessible to working memory.

The transfer (application) of knowledge is central to this thesis.

Motivation

As Shell *et al* did with the theories of learning and memory, they have incorporated many different theories of motivation (including those developed by Piaget and Vygotsky) under one

title - simply ‘motivation’. The ULM describes motivation as “...the psychological construct used to describe those things that impel and sustain us to put forth effort” (p 65). It is the ‘energy’ (Piaget – see figure 2) we need when learning is effortful. In classroom terms, this would be the influence that makes us do something, and how we will do it. The motivating influences need to be strong enough to sustain the effort long enough to complete the task. If it is not, the student will lose interest and focus, and very little learning will take place. In the past, each theory of motivation gave us information about different aspects of this concept, but “...each of necessity neglects the others” (Cook and Artino, 2016). The ULM brings them all together, and shows not only how they are linked, but also how the different combinations of each kind of motivation could be the driving force behind how the student’s efforts are initiated, directed and sustained. There is a great deal more to motivation than simply being only one kind or another.

In the scope of this research study, I will not be looking at the biological motivators such as drives to satisfy hunger or thirst. Although they are important, they do not influence the *motivation* for classroom learning (p 67) in this group of boys. However, they do need to be considered, as if a child is hungry, they cannot learn effectively. What the biological drives do is to take attention away from the *task*, it does not influence the motivation or desire *to learn*.

In my understanding, the ULM states that there are three main kinds of motivators that affect learning. The first are the *cognitive motivators*, such as setting goals, goal value, contingencies and expectancies, and self-efficacy. The second are our *emotions*. The third kind of motivator that will affect how we approach a task is *interest*. According to the ULM, all three kinds of motivators have a significant influence on working memory allocation.

Cognitive motivators

Goals

“All intentional learning is goal directed” (Shell et al, 2010, p 69). This means that everything being taught or learned in the classroom has a goal. It may be a small goal for the student such as completing the problem in front of them, or it may be a bigger goal such as completing a large project, or even a longer-term goal such as achieving a year mark of over 80%. Previous goal orientation theories argue that students will be motivated to achieve a task because they

want to master specific content. The driving force here is either wanting to master the content (mastery goal) or the student is afraid of failure (performance goals) (Cook and Altino, 2016). Dweck's notions of "growth" and "fixed" mindsets (2012) would fit in here. She argues that our beliefs about our abilities and intelligence can either arise from a "fixed" mindset (we are born with what we have, and it cannot be changed), or from a "growth mindset" (with effort we can change our abilities and intelligence). According to the ULM, goals drive processing and are an integral part of working memory. Goals are what keep the student focused, especially over a long period of time. Although other cognitive theories have acknowledged the influences goals have on learning, the ULM focuses specifically on how the influence of having goals affects working memory (p 69). As nothing is learned without working memory, it is critical for this study, therefore, to understand the nature of these goals, and what drives them.

Achieving a goal involves trying different methods (previously experienced or new methods). This means that, in accordance with the principles of the ULM, goals can be regarded as procedural knowledge chains, and can be strengthened or weakened, just as other knowledge links can be (p 70). As such, having and achieving goals can be learned; they can be attached to declarative knowledge chunks; they can be included in a procedural knowledge chain; they can be retrieved in the same way sensory inputs are retrieved - through pattern matching; they can be automatised; and they must be treated in the same way the other kinds of knowledge (episodic and semantic) are treated within working memory. The first three rules of learning will apply to goals as well (attention, repetition, connections). When working memory has a goal to achieve, it will select the relevant information to use, the most tried and tested way of achieving it, and it will attach the outcome to that particular knowledge chunk or chain. However, working memory can only act on one goal at a time. If a student is busy with a particular task, and another, possibly more interesting, one comes along, it will take up working memory allocation, and possibly distract the student from their original goal. We can see this play out in the classroom when a student is distracted by their peers' behaviour, or the teacher giving new and different instructions. Students with ADD will have difficulty maintaining focus on a task as there are so many other, more interesting things to look at or participate in, especially if the task they are doing is difficult. Goals are also very subjective.

Each student will have a different way of solving a problem and will have different memories of success or failure. Assuming that a goal for a specific task will mean the same thing to all students is a mistake.

Goal value

Goals can have values (p 71). That is, each goal has a worth, and this worth affects how much effort is put into the task. A goal with a high value (it can bring the student the respect or success they seek, or good feelings or emotions) will motivate them to put in the required effort, for the required amount of time. With higher value, comes increased attention to the task. The first principle of learning comes into effect - that learning is a product of working memory allocation (p 71). The value given to goals is very subjective and is based on the student's *own* knowledge and experience. However, we can learn to value certain goals by observing behaviours in our society. For example, if our parents are readers, we will learn to value reading by watching them. We also learn to value certain behaviours (such as manners) from the adults in our environments.

Goals keep us focused, and they keep our attention only on what is relevant and necessary for us to attain them (p 71).

Contingencies

Previous expectancy-value theories of motivation would fit into this set of motivators. The expectancy-value theories highlight two main factors that would affect a student's behaviour - the degree to which the student believes they will be successful and the importance they place on achieving the task (Cook and Altino, 2016).

The ULM talks about *contingencies* that link our experiences between our knowledge, our behaviours and the outcomes of our actions. These contingencies are the "probabilities" that one thing (such as a course of action) is associated with the outcome (was it successful or not? How successful was it?) (p 71). The more often the course of action reaps success, the stronger the neural connection for that action-outcome procedure will become. Like long term potentiations becoming knowledge, the more often it is strengthened, the better it will be stored. To take this one step further, the more often the course of action is taken, we can start to "expect" that particular outcome. The ULM calls these "expectancies" (p 71). These expectancies underlie all our episodic knowledge and can therefore be learned (p 71). To give

an example from a classroom situation, the contingency will arise between studying and getting good grades if it happens often enough. We can then expect to get good grades in the future if we study. As contingencies can be learned, they are therefore a type of knowledge, just like semantic knowledge. All our past experiences and the frequency with which they have occurred will inform our expectancy of a certain outcome each time. The ULM's rules of learning and the principles of learning will apply to these chunks of contingency knowledge. They can be retrieved through pattern matching, and also linked to other knowledge chunks or procedural chains. Like both declarative and procedural knowledge, they take up a slot, or slots, within working memory. Any successful contingency will motivate us to use it again. On the other hand, if we experience repeated failure in something, such as spelling, we will expect to fail on every test in the future. As we are generally wired to pursue those things that make us feel good about ourselves, those connections that do so will be strengthened. Anything that does not make us feel good will be avoided. Achieving in Maths but not in spelling will motivate a student to put more effort into his Maths tasks than his spelling tasks.

Expectancies

Our life experiences can also be affected by things we observe, not only by what we experience first-hand. We do not have to be shouted at by the teacher to know that it happens. We can even learn what makes the teacher shout, and we will try to avoid such actions. Contingencies allow us to try out different scenarios in working memory before we take action to try and predict the consequences of those actions. Contingencies "are motivational because they produce *expectancies* that allow prediction of what to expect for possible alternative actions" (p 71). These expectancies will motivate us to follow actions that bring about a good feeling - one of success, achievement, satisfaction etc. Expectancies have a huge effect on working memory allocation, as they "...bias action and working memory allocation towards those things that have worked in the past" (p 73). Yet, they can also stop us from trying out new methods as we become comfortable with what we already know.

The ULM talks about three different kinds of expectancies (p 73).

- The first is the *means-based expectancy*. This is a kind of "if this...then that" situation. As in the example given above, if I want good grades, I must study. These expectancies dictate the action we will take.

- The second kind of expectancy is the *outcome expectancy*. This takes it one step further - if I get good grades, I can expect to get a good job. It also answers the question "what else can I get?". Outcome expectancies serve to motivate us to achieve our goals, and to make sure we take the right actions to do so.

- The third kind of expectancy is the *success expectancy*. These are based on the contingency between what we do to achieve our goal and how successful we are in actually achieving it. This is especially significant when thinking about the skill of spelling. If a student has tried many times to spell correctly, or has studied hard for a spelling test, yet fails repeatedly, they will develop a strong contingency between spelling and failing, and thus expect to fail each time. This could lead to them becoming "comfortable" in their failure, and not be motivated to try different methods of studying (as mentioned above). Success expectancies motivate our choice of which goal will take priority over others - the student may decide to put their efforts into Maths, where they are experiencing success, rather than into spelling.

Contingencies and expectancies can be seen as past experience influencing the expected future.

Self-efficacy

The last of the cognitive motivators is self-efficacy. The past theories of motivation that would fit into this category are called the self-determination theories (Cook and Altino, 2016). These theories suggest that motivation varies in quantity (the strength of the drive) and quality (Cook and Altino, 2016). According to the ULM, the expectations we have of achieving our goals may not be motivating enough if we do not believe we can actually achieve them, or that we have the ability to do so. The ULM refers to this as "self-efficacy". More specifically, self-efficacy is "...our subjective probability of being able to effectively...execute a procedural knowledge action sequence" (p 74). If we think we can, and we can do it successfully, we will apply our focus and try it. If not, we won't even try. In essence, self-efficacy is the record (a knowledge chunk) we keep of all the times we have tried something, what was done and how effective it was. As it is a knowledge chunk, it will enter working memory and it will be attached, or linked, to other chunks or procedural chains, just as any other kind of knowledge. Shell *et al* believe that the motivation from this extremely personal knowledge chunk is stronger than that from our expectancies. In terms of working memory, self-efficacy "...motivates our attention to procedures that we are likely to perform successfully" (p 74). This

provides the insight that a memory of self-efficacy (that knowledge chunk that remembers how often we have done a similar task and how successful we were) will have a huge effect on the willingness of students who battle with spelling, motivating them to actually apply their attention and focus on tasks they feel they do not have the skills or knowledge to achieve. How often have we given up on something we feel is beyond our reach, before even really trying?

Although self-efficacy originates in our episodic knowledge of our past experiences, it can also be learned from observing others. Seeing someone else succeed can help increase self-efficacy (p 75). In the classroom situation, the ULM states that self-efficacy is more easily "...undermine[d] than instilled" (p 75). This is a critical thing to understand from a teacher's point of view. For example, self-efficacy can be undermined by: comparing ourselves to others; if we perceive that others can do it better than we can; and if we are too tired. When our sense of self-efficacy is low, we may not have the energy to put into a task we would normally not hesitate to perform. The more we practise something, the better we get at it, the more our self-efficacy will increase, and the better our future success in the task. This then means that we will have more confidence to try something we are unfamiliar with if we have experienced repeated success with similar or related tasks in the past. Success breeds success. On the other hand, the reverse could also become reality.

Emotions

So far, I have looked at goals: their purpose; how their value affects how much attention we will allocate to them; how they direct our contingencies and expectancies, which in turn affect our motivation to engage with a task; and how they help develop a positive self-efficacy through repeated success. I will now turn to how emotions affect our learning.

Past theories of attribution could be included in this category of motivators. They contend that the student will find causes for the results of their actions, which will be closely linked to their emotions (Cook and Altino, 2016).

Recent research has shown that, on a neurobiological level, there are connections between the areas associated with working memory in the prefrontal cortex and the amygdala (the area associated with emotions: LaBar and Cabeza, 2006 as cited in Shell *et al,* 2010, p 76). This research has also shown connections between the amygdala and the areas associated with our

episodic memory. It is all interconnected. This means that the emotions associated with an experience or knowledge construct at the time it enters working memory will be attached to the knowledge chunk we will retrieve when we pattern match a similar experience – i.e. if a student experiences a negative emotion around learning to spell, each time they have to do spelling, they will experience that negative emotion and so their motivation to engage with spelling will be minimal.

This is not the only role emotions play. According to the ULM, they have many different roles (p 76). The first is to engage with working memory during cognitive processing. Working memory receives input from the information being presented, from any results of pattern matching and retrieval, as well as input from the emotions. It serves as a motivating force as it directs working memory attention to deal with the things we like to do, or towards a goal we know we can achieve, or an action that will give us a good feeling. Emotions can also take working memory attention away from the goal we are working towards if they are very strong, or possibly new. Before I started on this research project, I used to think of working memory as a virtual "desk" where everything we needed to complete the task could be placed. Negative emotions and anxiety would "shrink" the desk, so limiting the available space for thinking and cognitive processing. The concept of emotions taking one of the four slots in working memory is very similar - it makes less working space available for all our thinking and learning to happen. On the other hand, positive emotions enable us to maintain sustained effort on a task. Just think of a time where your need to achieve your goal was so strong, you went over and above what you needed to do to accomplish it. You need only watch the faces of sportsmen and women as they compete - total focus over the time it takes for the match to end. Even young children can focus on a video game or a Lego project for a much longer time than when having to read or do homework.

Emotions are "...intimately connected with knowledge" (p 76). This means we can have very strong emotional connections to things we have experienced in our lives - to our episodic knowledge. As I have mentioned previously, episodic knowledge often decays quickly, and while we can remember the broad sequence of events, we may not be able to recall all the minute detail. Strong emotions have the ability to keep our episodic memory from disappearing (p 76). If a young child has a strong emotional memory attached to an activity such as spelling, just the mention of the activity, or the knowledge that a spelling test is going to happen after break, can bring back all the negative emotions around it. These negative emotions take up

working memory capacity and can leave very little space for the child to access their knowledge on the subject, or to deal with the task they need to complete. This can lead to avoidance of anything connected to spelling as it only brings on negative emotions. At the other end of the scale, however, positive experiences can serve to motivate the child to try harder, or to build up resilience, even in the face of failure (p 77).

In the same way that emotions can be connected to our episodic knowledge, emotions can be attached to our declarative knowledge ("knowledge what…" or "knowledge that…"). As all knowledge starts off as episodic knowledge, whatever we experience through our emotions at the time of constructing this knowledge will be attached to that knowledge chunk. Perhaps this is where a student may begin to "know that" they are a poor speller.

But the ULM says emotions do not only direct attention in working memory or take up space in working memory. They can also act as goals in their own right (p 78). For example, our goal may be one of happiness or a sense of achievement. Shell *et al* call these kinds of goals "emotional goals" (p 78). These goals are set and strived for their own sake - simply to achieve happiness. They are also known as "intrinsic goals". Self-esteem is one such goal we seem to strive for in schools (p 78).

The ULM regards emotion as knowledge, just like another kind of knowledge. It follows the same three principles and the same five rules of learning as all the other kinds of knowledge. Emotions (p78):

- enter working memory just like any other input.
- follow the principles and rules for storage and connecting as other kinds of knowledge.
- can potentially affect cognitive processing and problem solving.
- have motivational properties in so far as they affect our thinking and behaviour.
- can be a goal to work towards, and as such, they can direct and motivate working memory allocation along with all the other kinds of goals.
- can be both biological (e.g. to feel happiness) and cognitive (i.e. they affect how we think and react to sensory input) and can therefore influence our learned knowledge.

Interest

Interest, the last of motivators the ULM acknowledges, is an area I used to focus on when planning lessons for students who experienced difficulties with reading and writing. It also helped guide what I would use as examples for teaching spelling and spelling strategies. In my training as a teacher, in particular as an academic support teacher, we were taught to design activities and tasks around the interests of the student, and not necessarily only the theme they were following in class. This has worked for me in the past, especially in a one-to-one situation where it is possible to focus on the student's interests. It served as a hook to get the student interested and engaged in the task, as it highlighted their knowledge, and they could 'show off' a little. In a group situation, this is a little more difficult as each student will have different areas of interest, but it is possible to agree on a common interest. The ULM acknowledges the importance of tapping into interest, although it also acknowledges that there is not a great deal that is known about its biological or cognitive structures (p 78). It seems interest could have emotional origins as positive emotions are often associated with an interest, but that may not be the case in all situations. For example, some interests do not involve emotions, and not all emotions will be positive (p 78). The ULM sees interest as directing "...attention and working memory allocation" (p 79). It works in a similar fashion to motivation. Shell *et al* perceive interest in two ways (p 79):

1. *Situational interest*. This kind of interest comes from our environment - from the sensory input we are experiencing at a particular moment in time. It is usually something new, novel or unusual. This "new" thing will redirect our attention towards it and will redirect all the resources working memory has to focus our attention on it. These novel or unusual things seem to pique our "interest" - something the ULM views as an emotion (p 79). Our reaction to this novel situation is stored as episodic memory and can therefore be linked to declarative knowledge chunks about this situation. Interest then works in a similar way to an emotion whereby it can direct and affect motivation to retrieve other knowledge chunks. However, in the same way that interest can increase the retrieval of knowledge and increase the strength of the connected neural pathways, it can also become a distraction for some students. For example, a student may have a passion for dinosaurs - something I would need to be aware of as I plan the activities. The student may be hooked and will direct their attention to the task when it is first introduced but may then become side-tracked by their own knowledge

and may want to share their knowledge with me or their peers. It then takes time to redirect their focus back to the task and may even distract them completely from what it is they needed to learn. But situational interest is a place to start.

2. *Personal interest*. This kind of interest comes from our experiences. It is related to what we do, and it helps sustain our motivation in achieving long-term goals (p 80). Should we lose interest in something, we will lose our motivation to achieve it. Personal interest directs attention towards achieving our goals. In contrast to other motivators such as self-efficacy, personal interest seems to keep a record of *what* we choose as goals (what we spend our time doing), rather than keeping track of the number of times we *succeed* in what we do (p 80). This can be seen with students who have lost interest in learning how to spell and also in trying to apply spelling to their written work. They seem to merely go through the motions when it comes to their spelling activities, and they do not put much thought or effort into completing the tasks. Many students I have observed tend to rush through the work and seem relieved when it is done! When I have broached the subject of spelling practice with some of the students I have taught, I get many different kinds of responses as to why they do not apply their mind: They believe they are simply "poor spellers"; the effort to edit their work is just too great; they will soon be able to use spell check (in primary school this is not yet an option); their parents do not seem to mind that they cannot spell, and tell them they will get concessions in high school. The list goes on. In each case, however, the student has lost the drive, or motivation, to *try* and spell as accurately as they are able. It is not an activity they choose to do, and when they have to do it, their knowledge is attached to many negative emotions.

Because each student's experiences are unique with regard to success or failure around spelling, it is important to remember that not all students have the same interest in, or levels of motivation for, achieving the spelling goals expected in the classroom. It will be very difficult to plan a spelling lesson that takes into account the interest of each and every student! It would also be a mistake to assume that something is interesting to everyone.

A summary so far

The ULM summarises the effect of the cognitive and emotional motivators in the following way (p 82):

1. *Goals* (the purpose of learning) help us to focus our attention on only that knowledge and those inputs that will help us achieve that goal. Everything else will be ignored.
2. *Goal value* - what is the goal worth and how much effort is needed to reach it?
3. *Contingencies* - will only select those goals *most likely* to produce the outcome we want.
4. *Expectancies* – the "if I do this...then…" expectancies or the "if I succeed, what else can I do?" expectancies. These expectancies help focus our attention and our knowledge retrieval on *only* those options we have for achieving our goal.
5. *Self-efficacy* - our belief in our abilities to achieve a goal directs our selection of those options and will enable us to choose those we feel we are *best able* to do.
6. *Emotions* - these affect our ability to sustain attention and therefore our allocation of working memory.
7. *Interest* - helps keep up sustained attention on our selected goal, and so affects the amount of working memory allocated to the task.

These cognitive and emotional motivators are attached to our episodic memories, and as such will allow us to "...project our past experience on to our current and future working memory allocation" (p 83). In other words, these motivators have a huge effect on how we will tackle difficult tasks in the future. They will help us build resilience in demanding situations, or they could assist us in developing a "learned helplessness" (we give up too easily) when we find things tough. The different aspects of motivation, according to the ULM, can be seen below.

This diagram represents my understanding of what constitutes motivation according to Shell *et al.*

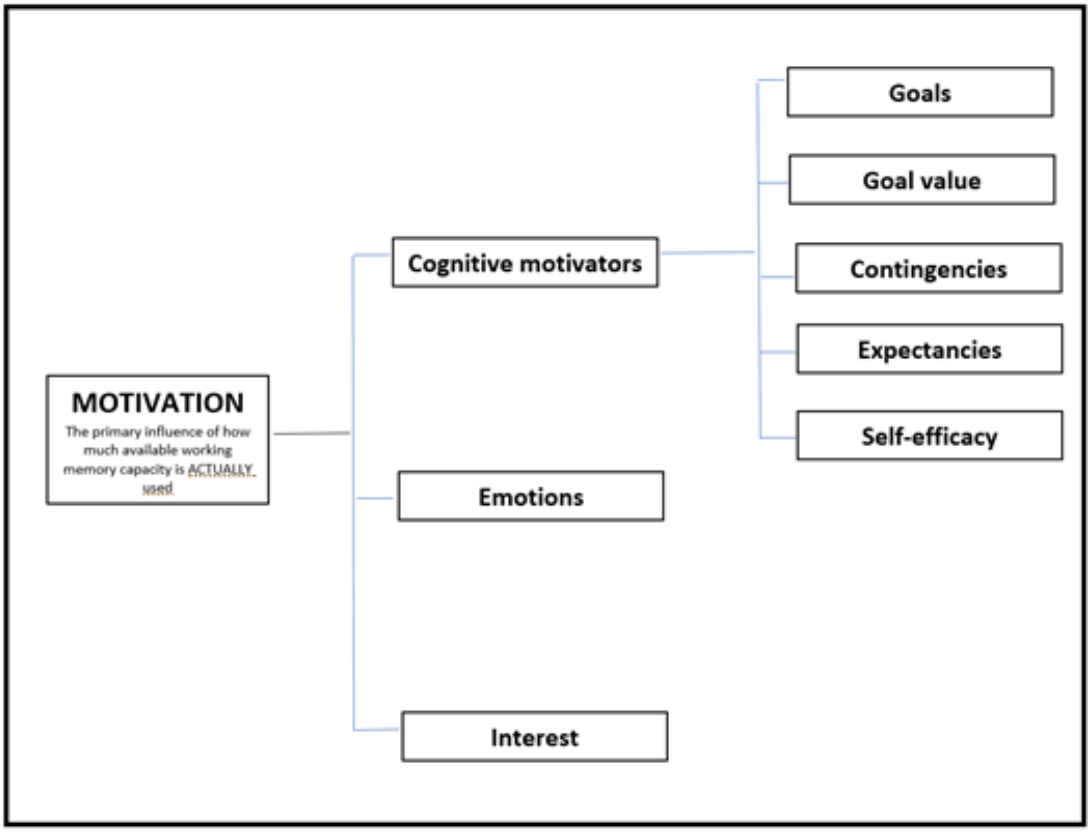


Figure 7 - A summary of the different categories of motivators in the ULM

The ULM brings all the information I have learned over the last few years together into one model of learning, based on scientific research. I now realise, through a better understanding of the role of motivation in learning, that a much deeper knowledge of the student's goals, emotions and motivation to persevere in a difficult subject such as spelling, is crucial to effective teaching and learning - and not only of spelling.

The ULM simplifies and condenses the concepts and processes involved in classroom learning into three key concepts (working memory, knowledge and motivation), three principles which link these concepts together and five rules of learning which can be applied to all classroom learning situations.

If I take the concepts, principles and rules outlined in the ULM, and apply them to my journey so far, I can see how the aspects of learning come together, and how they influence each other

in many ways. Everything is connected - be it related to working memory, the ability to pay attention to the task, the quality of prior knowledge or even the things that motivate us to persevere in difficult situations. We cannot ignore any part of the learning experience. If I look at the three major concepts the ULM embraces - working memory, knowledge and motivation - I see that prior to the ULM I have only paid close attention to the influences of the first two with regard to spelling. In the past, I included motivation under the overarching idea of prior knowledge or even areas of interest. I thought that if a student was engaged in the task through what interests him, he would be motivated to learn. I now realise it is so much more than that. In retrospect, I did not try to uncover the student's feelings or emotions around spelling - I assumed that if I could find the right interest level, make the activities interesting and dynamic enough (the novelty aspect of learning) I would be able to hold their interest and inspire them to begin to like spelling, and so be inclined to pay more attention to it when applying it in a written exercise.

The simplicity of the ULM lies in the way it reduces all classroom learning to three *concepts*, three *principles* and five *rules.* This was a major drawcard for me. The ULM offered me a conceptual tool with which to understand why some students could learn spelling in isolation but could not seem to carry it through into their writing.

The way in which the ULM simplifies learning into three principles which link these concepts of *working memory*, *knowledge* and *motivation* together, helped put into perspective the bigger picture of how learning happens - and how students learn to apply their spelling.

The first principle - "learning is a product of working memory allocation" (p 3) - was already familiar to me, but I had not grasped the fact that *no* learning happens without working memory. I had previously understood that the role working memory played was more in the sense of *how* the student received the information. In other words, if a student had a strength in auditory processing, they may then be identified as an auditory learner and so would need instructions and information presented in a predominantly auditory way. If they presented with strengths in visual learning, they would need their tasks to be designed with print or with pictures. I now understand it is not that simple. The above view does not consider any emotions, beliefs or experiences that might be attached to the student's episodic, declarative or procedural knowledge chunks. In the ULM, short term memory and working memory are combined into one, and learning will not happen unless working memory is involved.

The second principle - “working memory’s capacity for allocation is affected by prior knowledge” (p 3) - was also familiar to me. The ULM viewpoint agrees with the PASS theory of cognitive learning which states that accessing or tapping into the student’s prior knowledge is the first step to engaging attention. Both Piaget and Vygotsky also believed learning builds on what has been learned already. What the ULM did was that it showed me the *extent* to which prior knowledge can affect the allocation of working memory’s capacity. The more the student’s knowledge chunks are matched, connected and retrieved, the stronger the links become, and the more chance of any number of sensory inputs being able to access the linked knowledge.

It is perhaps the third principle of learning that most caught my attention. This principle says that “working memory allocation is directed by motivation” (p 3). For the ULM, every directed learning experience has a goal - the acquisition of knowledge. Every goal is attached to highly influential cognitive motivators such as goal value or self-efficacy. The higher the value of the goal, the higher the level of effort the student will put into the task. With high effort comes increased attention, and therefore an increase in working memory allocation Motivation is the primary influence on how much of the available working memory capacity is actually used.

The five rules the ULM applies to all learning helped guide my thinking when looking at how learning in general happens. Rule 1 states that “new learning requires attention” (p 14). If I look at the fourteen different kinds of attention controls Levine (2002) suggests we have, there are many different kinds of attention controls to consider when trying to discover why the student cannot pay sustained attention on a task. For example, many of the boys I teach find it very difficult to get started on a task, especially if the task is seen as “boring” or too difficult. This would refer to the mental effort function of the mental energy control (Levine, 2002, p 58). The ULM says if attention is not paid to the task, no matter what form the distraction takes, learning will not happen. It might be useful for me to look at the different stressors my students are under, as any *one* of the different attention controls can take up one (or more) of the four slots in working memory, and this will reduce the effectiveness of the student’s learning.

Rule 2 states that “learning requires repetition” (p 14). Repetition is necessary to build and strengthen the neural pathways. The ability of working memory to pattern-match the task with prior knowledge, and to do it quickly (automaticity), is crucial to the skills of spelling and

fluent reading. However, not all practise is equal. Through a better understanding of how motivation directs attention, and therefore working memory allocation, I can see that many classroom spelling activities are not providing the kinds of opportunities that would engage the interest, and therefore the motivation, of the students in general. Many activities simply require learning lists of words. The ULM has made it clear to me that practice needs to be varied, and needs to link as many declarative knowledge chunks (for example, prior knowledge of the letter-sound connection, links to different meanings, connections between words), procedural knowledge chains (such as the strategies used to decode words) and episodic knowledge (involving expectancies around the success or failure in the task, emotions and interests) as possible.

Rule 3 states that "learning is about connections" (p 14). Although I was already aware of the connections between spelling, prior knowledge, vocabulary, the richness of the student's home environment and their experiences, I was not aware of how deeply entrenched emotions could be in the overall learning experience of the student - particularly in specific areas. Repeated failure will lead to even more failure if nothing is done to break the cycle. Repeated success will also lead to more success - thus raising the motivation around the activity. On an encouraging note, the ULM says these negative connections can be broken, enabling new, more positive ones to replace them (in a similar way to Piaget's theory of assimilation, accommodation and equilibration). The ULM also says that positive motivation, while not able to neurologically increase the capacity of working memory, can certainly contribute to a much broader connection between knowledge chunks and chains, thus effectively increasing the amount of knowledge held in each slot, and so increasing working memory's capacity. I found this fascinating! I had often wondered how a student could access so much knowledge in areas they were passionate about (things such as playing Minecraft; dinosaurs; Pokemon card games) yet could not remember how to spell "were". By recognising the role of motivation in making connections and accessing knowledge, this was easier to understand.

Rule 4 states "some learning is effortless, some requires effort" (p 15). It takes more effort to *have* to learn something, especially when it is something we do not have much interest in! We all know how hard it can be to apply our attention to a task we would rather avoid - how much effort we must exert in order to complete it. As adults, we have learned the advantages of mustering this effort, but a 9-year-old boy still finds this extremely challenging. If something is hard, he would probably expect to fail at it, therefore he would not be motivated to try. The

emotions around this expectancy would be negative and could result in a high level of anxiety. All these knowledge chunks add together and take up slots in working memory, reducing the slots available for accessing any other prior knowledge he might have. It is a self-fulfilling prophecy.

According to rule 5, all neurons learn in the same way. However, not all students learn in the same way. I do understand this, but it was the role of motivation that held the key for me as far as being able to better understand each student's needs or plan their activities. Yet, it would be a grave mistake to assume that every student will have the same interests, or even the same level of interest in a topic.
The diagram below illustrates the connectedness of the three concepts highlighted in the ULM as they could apply to spelling.

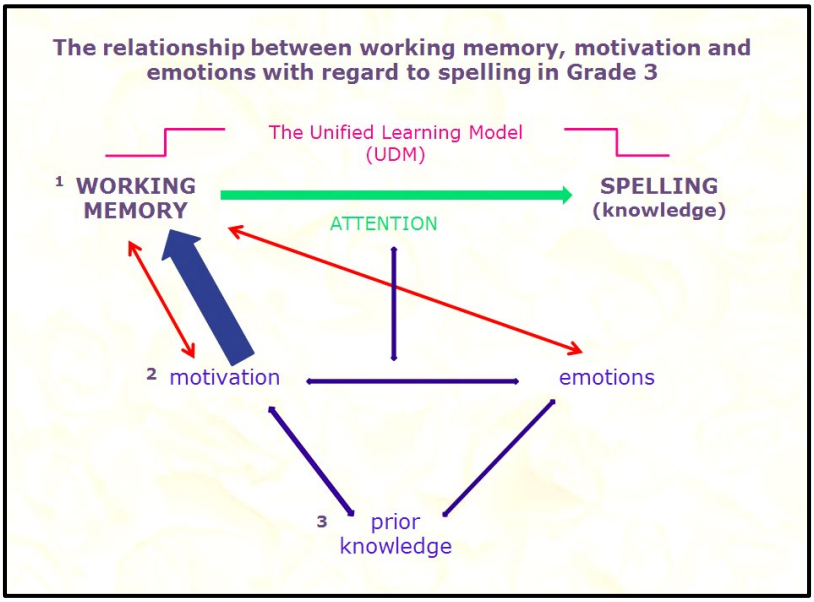


Figure 8 - Diagram showing my understanding of the relationships between working memory, motivation and spelling using the ULM model of learning

An explanation of Figure 8

The diagram above shows the interconnectedness of the three concepts of the ULM (working memory, motivation and prior knowledge). The overarching model within which these concepts operate is the Unified Learning Model (pink section). The diagram sums up the following:

- Learning is a product of working memory allocation, and all new learning requires attention (green).
- Working memory allocation is directed by motivation (2).
- Working memory's capacity for allocation is affected by prior knowledge (3).
- Emotions and motivation to learn or apply spelling affects working memory both positively (blue) and negatively (red).
- Motivation, emotions and prior knowledge are affected by *and* affect the amount of attention paid to the task.

Everything is connected, and no one aspect of this model of learning should be underestimated. The ULM highlights the roles working memory and motivation, while previous theories of learning had not. Motivation is the one aspect I had not yet considered to play a major role in learning and applying spelling. This study hopes to focus on the concept of motivation to investigate the disconnect between learned and applied spelling with Grade 4 boys.

Conclusion

The ULM helped me understand that motivation plays a central role in learning – from the effects it has on the child's ability to pay attention, to the thought that working memory allocation is directed by *motivation* (rule number 3). It helped me connect the dots between goal setting, emotions, expected outcomes and the student's personal interests (see fig. 4). It helped me understand that motivation could be the key to effective learning and possibly, the application of knowledge - a detail that I had not yet considered, nor fully understood.

In the following chapter, I will review what Piaget and Vygotsky theorise about motivation and its effects on learning in the light of the great importance the ULM place on its role in the learning process.

CHAPTER 5: Spelling acquisition

Chapters 2 to 4 have reviewed the theories of how learning happens, and role motivation plays in that learning. In this chapter, I will review the skills and knowledge a child needs so that they can apply what they know of English spelling. I will not discuss the pros and cons of different spelling programmes, nor will I analyse spelling difficulties. The importance of this chapter to this research study is to indicate where the concepts of attention, working memory and prior knowledge fit into the learning and applying of spelling, and how the gap between learning and applying what the boys know might grow. Ideally, a child *would* choose to apply what they know, but, as with the group of participants in this study, what a child knows and what they chooses to apply do not always correspond.

I will look at the knowledge, skills and strategies needed for the effective application of spelling knowledge using three of the concepts outlined in Chapter 2: prior knowledge, working memory and attention. I will discuss motivation and attention together as attention influences working memory's capacity for functioning (Shell *et al*, 2010). I will use a fourth category – that of conditions for teaching and learning – to review how classroom and teaching conditions can affect how spelling is learned. Finally, I will look at some common spelling errors children make, and link them to the concepts of attention, prior knowledge and working memory.

The broad picture

The problem with spelling is that it needs to be explicitly taught, it is not a progressive development. It needs time and meaningful practice – both of which are in short supply in the modern classroom. If the child has not grasped the concept of symbols representing oral sounds and words right from the start, there is no point in trying to build on knowledge that is not yet secure. But it is very difficult for the teacher to know exactly at what level each and every child in her class is.

There are two main methods of teaching English spelling – the synthetic method (phonics) and the whole language method. There has been much debate around which is the more effective, but there has been no conclusive proof either way as yet (Reyhner, 2018).

The synthetic method

The synthetic method involves teaching the child the connection between the letters and their sounds first (phonics) and focuses on the sounds of the words. This enables the child to decode (break words down into their respective sounds in order to work out an unfamiliar word) and to build words up using the letter-sound connection. The programme introduces the letters in a specific order, not necessarily in alphabetical order, and includes the vowel and consonant diagraphs and trigraphs at a later stage in the child's schooling. The programme uses pictures, stories, songs, rhymes and actions to consolidate the letter-sound connections (Jolly Phonics online course).

The whole language method

The whole language method encourages the child to look at whole words and make meaning of them by using cues from the pictures in the book. It is based on Vygotsky's constructivist learning theory, where the reading programme is scaffolded to help the child make meaning of the text (Reyhner, 2018). The child constructs their own word reading vocabulary by linking what they knows about words and pictures to the new information they comes across in the books (Jolly Phonics online course; Reyhner, 2018). This approach focuses on the flow and meaning of the text. Decoding of words is through the context of the child's experiences, interests and culture. This reading programme has picture books the child can learn from, and the child is supported in their reading journey through the use of other materials such as toys, games and experiences through which they will develop their vocabulary (Jolly Phonics online course; Reyhner, 2018).

There are pros and cons for both methods, and the debate has been raging for years (Reyhner, 2018). It is not within the scope of this study to look at *how* spelling is taught. There are many different spelling programmes that all claim to meet the requirements for teaching successful spelling. The phonics / synthetic method includes aspects such as appealing to the student's five senses - there are activities that link the sound-letter to an action, a sound, a visual symbol and rhymes. Some programmes introduce the different sound-letter connections quickly, some take a lot longer to build these connections. Some use the "whole word" method of teaching reading and spelling as part of the whole language method already referred to. By Grade 4, the students with whom I will work can already read and spell (with varying degrees of success), so they already have prior knowledge of how to spell. This knowledge is the basis from which I will work. It needs to be noted that the boys in this study have been taught using the phonetic

method of spelling and reading. Yet, as this study will look at the motivation around what the boy does know and what he chooses to apply, the *method* of spelling instruction is not relevant.

Whatever method is used to teach spelling, the way in which a student's brain learns to spell is the same (Rule number 5 of the ULM – learning is learning. Shell *et al*, 2010, p 15). On a neurobiological level, the neurons are either built up and strengthened or they are not. However, although all neurons may learn in the same way, not all students learn in the same way (Shell *et al*, 2010, p 15).

Prior knowledge

Students are '…aided by different prior knowledge patterns' (Shell *et al*, 2010, p 15). Thus, prior knowledge plays an important part in how the student chooses to apply his knowledge of spelling. Knowledge of phonics (the sound-letter connection) is progressive and is built up over time. In order to apply their knowledge when reading or writing, the child needs to have quick and easy access to this knowledge (see Chapter 3 – automatising knowledge) so that they can read and write fluently. If it is an effort to apply their knowledge for any reason, the child will not be inclined to persevere with the task. Prior knowledge of how to spell and how to apply spelling includes:

- Knowing the relationship between the visual symbols and their sounds - both the letter-sound relationship and the grapheme-phoneme correspondence (what the letter looks like and its sound, together with how to write the letter) (Levine, 1998, p 386).
- The knowledge of how to break the word up into its component sounds (auditory analysis) and remembering the letter-sound connection. The child must *remember how* to break the word up into chunks of letters such as a blend (/th/; /st/; /tr/ etc) and its vowel components, both singular vowel sounds and vowel digraphs (/ea/; /oa/; /ou/ etc) (Jolly Phonics online course; Levine, 1998, p 386).
- The child must already have a metalinguistic awareness of how language is connected in areas of meaning, relationships between prepositions, nouns, verbs etc, but specifically, *remembering that* language can be manipulated.
- Prior knowledge for spelling involves the ability to think about how a word might be spelt (phonetic analysis). This is the ability to analyse a word structurally - using *knowledge of* prefixes, suffixes and other familiar parts of a word - to determine its meaning. This can be

tricky in English, as there are many ways to spell the same sound, and many irregular words that do not follow any rule (Levine, 1998, p 387).

- Prior knowledge for spelling includes having a sound knowledge of English. The student needs to have a good vocabulary and a good understanding of how words are formed and used - such as the use of homonyms (words that sound the same, are spelt the same but have different meanings - for example 'bowl') and homophones (words that sound the same but have different spelling and meaning. For example, 'red' and 'read'). This is what Craik and Lockhart (1992, cited in Eysenck, 1993, p77) call the deepest level of cognitive processing.
- The child needs the knowledge and an understanding of the 'deep structures of language' (Chomsky, 1970, cited in Levine 2001, p386). This understanding helps the student draw on what they know about similar meanings or linking the unfamiliar word to familiar ones (for example 'cent', 'century', 'centurion').
- Prior knowledge of words incorporates a rote memory of how the word looks (Levine, 1998, p 387; Levine, 2002, p 162).
- The child needs to remember the many different spelling rules along with all the many exceptions to these rules.
- Prior knowledge includes the knowledge chunks (or schemes) of how they *use* their knowledge of language. Their attitude towards language, too, would also affect how they use language (Donaldson, 1979, p 89).
- Finally, attached to all these cognitive aspects of learning to spell are the knowledge chunks of emotion, feelings, expectancies of success or failure and past experiences (see Chapter 4).

All the above knowledge must be in place and be accessible to the child as automatically as possible, for working memory to function efficiently.

Working memory and attention

Spelling in English, where the language has borrowed words from many other different languages, is a complex activity. There are rules to follow but there also many exceptions to these rules. There is a great deal to remember, and to hold onto in working memory until the task is done. Levine (1998) describes spelling as '...an intriguing model of decision making' (p386). This decision making requires working memory to constantly pattern match the words to prior knowledge (Shell *et al*, 2010, p 22). It is not simply a case of learning how certain

letters fit together to create a word, and then being able to reproduce that word on paper. If the neurological pathways of the knowledge chunks needed for the spelling activity are not strong, the child will struggle to make sense of what they need to do.

Apart from having to constantly look for patterns or for knowledge chunks relating to the task, working memory must also:

- Keep track of the physical aspects of writing, such as how to form each letter or how hold the pencil (Levine, 2002, p 102). Is the grip too tight? If it is, the whole arm moves to write, which is extremely tiring. Posture affects writing in that weak core muscles make sitting upright to write very tiring. Being physically uncomfortable means that some of the child's attention might be directed to getting comfortable (lying on their arm to write, fidgeting, talking) instead of being directed to the task. Diminished attention to the task results in a less-than-optimal learning experience (see Chapters 2 and 3; Levine 2002, p 102).
- How to punctuate the sentences properly, the meaning of what they want to write, the kinds of words they want to use and the logical flow of the sentence or paragraph. Balancing all these aspects of writing takes huge amounts of mental energy and working memory space. Any part of the writing process that is effortful for the child - such as spelling accurately - tends to be ignored (Levine, 2002, p 102).
- The ability to pay focused attention to the task affects how much working memory is allocated to the task (see Chapter 3). '…tightly controlled attention expands active working memory space and weak attention diminishes it' (Levine, 2002, p 104). Rule number one for effective learning in the ULM model states: 'New learning requires attention' (Shell *et al*, 2010, p 14). If the child finds spelling difficult, they will not put effort into focusing on what needs to be done. If they find writing difficult for any reason, they will not want to pay attention to the task.

Working memory, the ability to pay attention to the task and the quality of the child's prior knowledge of spelling and its conventions are intricately linked. But there is one more area of learning to consider when reviewing the ability to learn and apply spelling.

The teaching and learning environment

The previous 2 sections relate to the child, their ability to learn and their personal experiences. As mentioned above, spelling must be explicitly taught, and this requires a teacher. The child is not taught in isolation and therefore must adjust to being part of a large group of children, all of whom are at varying levels of cognitive and affective development, and all of whom come from different backgrounds. Each child is different. Each child brings to the learning situation different levels of understanding of English. In South Africa, we have classes were the children do not all speak the same language at home – yet they are taught predominantly in English. English could be their second, third or even fourth language. Within the school I teach, most of the boys do speak English at home, but it may not be the primary spoken language. The teacher is in a very difficult position as they need to keep in mind just how different each child is. The rural situation is even more extreme. Many young children come from homes where their parents may speak different languages, and may not have a knowledge of English themselves, so cannot support their children. That further complicates the teaching and learning of English spelling.

All methods of teaching spelling agree on certain points. Each method highlights the following:

- The child must be given enough time to learn the coding system, to use it and to be able to reflect (Furth, 1969) on the different possibilities there are to spell a word (this includes the many ways a vowel sound could be spelled, the choices of homonyms or homophones) (Donaldson, 1979, p 94).
- The kinds of teaching methods must be optimal for learning (Vygotsky, 1978) – the tasks must be meaningful to the child. They must be age-appropriate, have a novel enough level of interest and they need to have a balance of what the child knows, and what the child does not yet know (Donaldson, 1979, p 100).
- A set way of remembering how to spell the word (i.e. strategies) which is dependent on the method of teaching spelling being used (phonetically or whole word recognition).
- The child needs to have a positive learning experience, which means they need to experience success (Piaget), have a good relationship with a caring, more knowledgeable other (Vygotsky) and be able to make meaning of what he is doing.
- The child needs many different opportunities to practise their skills – opportunities across different subjects and in varying contexts.

Learning to spell and being able to apply that knowledge are complicated processes. There is so much more to this area of learning than just being able to recognise the sound-symbol connection, so much more than simply being able to remember what a word looks like or sounds like. So how does learning to spell and being able to apply this knowledge fit into the theories of learning of Piaget and Vygotsky?

Application of the theories of learning to applied spelling

Donaldson (1979) draws on both Piaget and Vygotsky to better understand just what is needed to teach and learn spelling. Most importantly, she highlights the ability to make *meaning* of the spoken, and then written, word (Donaldson, 1979, p 87). The young child comes to school already talking, with a certain knowledge of spoken word – some of its meaning and the actions attached to those meanings. However, the child is more concerned about (or aware of) talking *about* something than the actual words he *uses* (how he expresses himself) (Donaldson, 1979, p 87). The young child begins to learn to spell at around the age of five to six years old – the pre-operational stage of thinking according to Piaget. This stage is categorised by a shift in the child's thinking as they become aware of other people's intentions and feelings (Piaget, 1981, p 14). Making meaning of words and actions becomes more critical, as the child must work out what other people may mean, especially if it is in opposition to their own understanding. This relates to not only having to make meaning of spoken words, but it is also the foundation on which the child will build a relationship with their teacher. This is a critical aspect of learning in Vygotsky's concept of the zone of proximal development (see Chapter 2). The teacher is the more knowledgeable other that creates the safe environment where the child can make mistakes and be confident enough to learn from them. So the teacher's actions and words matter. Do their actions reflect their words? Or do they say one thing, then do another? Is the teacher's feedback age-appropriate, caring and explicit? When planning activities, does the teacher consider how meaningful the activity is to the children? How closely related to real life are the words that are used? Do they consider how well the child understands the purpose of the activity and why the child must do it? All these things impact how meaningful the learning experience will be for the child (Donaldson, 1979, p 121). It has been my experience that the children I have taught, and the ones I teach at present, are very intuitive in reading the teacher's actions and words. If the child experiences difficulty and it is not handled in the correct way, the child will start to develop negative emotions around activities such as learning to spell. Piaget argues that in this pre-operational stage the young child starts to develop aspects of self-

esteem. It is consolidated in the next stage of development - the concrete operational stage at 7 to 11 years old.

At five or six years of age, the young child is expected to make meaning of the written symbols of speech. Not only that, but they are expected to be adept at manipulating them to form words and sentences. This requires the child to be able to conceptualise language – of having the ability to see language as existing in a separate time and space to what is happening right now (Donaldson, 1979, p 89). Children come into the classroom with different levels of capability where this is concerned. Children who have come from a background where words, speaking and books are valued, will have a huge advantage over a child who has been deprived of these opportunities for whatever reason – poverty, neglect or the lack of value being placed on literary development. As teachers, we often place all the children in our class in the same category. We do not differentiate when it comes to giving instructions – we assume that all the children will understand equally. It is not practical (or even possible) for the teacher to know every detail about every child as far as their language value system is concerned. We can, however, pay closer attention to those children who seem to really struggle with comprehending and manipulating the letter-sound connections when learning to spell and try to understand why.

Making meaning of symbols and sounds is a huge leap in the cognitive development of the child. And as both Piaget and Vygotsky argue, this development in thinking and learning is closely linked to the affective development of the child. There are a multitude of areas where the child can experience difficulties. In my understanding of Donaldson's writings, a child may come to school without the necessary cognitive skills, thinking abilities and / or pre-reading knowledge. They will then be at a disadvantage in comparison to those who do. It will be a case of constant catch-up for them, which is never a good place from which to start. The child may not have the language to express their non-understanding (Vygotsky) and they may not be cognitively and affectively mature enough (Piaget) to deal with this sense of not keeping up. According to Piaget's stages of development, the child at the pre-operational stage (ages 2 to 7 years old) is developing an awareness of self in comparison to others – this is the start of developing their self-esteem. It is a critical stage for classroom learning as the child begins to hold themselves up against theirs peers – they start to judge their own performances and abilities against what they perceive to be the strengths and weaknesses of others. The child begins to write their own story regarding their abilities as a 'speller'.

Regarding time and opportunities to reflect on what they learn, it is my considered opinion that, having taught children with spelling difficulties for many years, we rush children through many classroom processes, and specifically, the writing process. The boys I teach have good knowledge of phonics (the letter-sound connection) and an age-appropriate knowledge of words having different meanings and connections (the deeper understanding of the language). When it comes to applying this knowledge, we do not give them enough time to write, reflect on and improve their writing (Donaldson, 1979, p 94). This includes the time to think about spelling and the many different ways they could spell a word according to its meaning. In addition to this, if a child has perceived issues with spelling, they will want to finish the task a soon as they can, just to get it done. They will not want to proofread it, and quite often a child who does have difficulties with spelling may not even see their errors. Having observed the boys I teach over the years in many classroom situations, this kind of avoidance behaviour is prevalent. They want to finish the comprehension or creative sentences as quickly as is humanly possible so that they can get on with something else. Time is also a problem in that the boys who battle with writing tend to work slowly, and so fall behind their peers. As a result, they are under pressure to finish their work within a set time. Writing activities seem to be fraught with rushing for different reasons and from different sources.

At this point, I must make mention of dictation. This is the part of the spelling test where the lack of ability to apply spelling knowledge shows up most prominently. Dictation does, however, have some advantages. It gives the child practise in:

- Listening for the sounds in the words
- Using the new spelling patterns
- Improving writing speed
- Using punctuation
- Developing handwriting
- And it helps the teacher monitor the child's progress in handwriting, letter formation and to assess how well the child has consolidated his phonics knowledge.

What does matters is how it is done, and how the results are given out. Is there enough time given for the child to make a choice of letters should the sound have many ways in which to

spell it? How fast does the teacher read the sentences? Are the sentences age-appropriate? How do the teacher or parents deal with errors? How is feedback handled?

The final point I would like to consider, that would have an impact on how well a child may learn to spell, and how they may construct their beliefs of themselves as a speller, is the attitude of the teacher, school and parents towards the importance of spelling. As I have mentioned earlier, the child picks up many cues from their environment and cultural beliefs (Vygotsky, 1978). The attitudes towards spelling held by the teacher and the school are reflected in how they manage the feedback of tasks and how these adults make the child aware of their own errors. Donaldson argues that it is a case of 'wrong is bad' and 'right is good' in many classrooms (Donaldson, 1979, p 106). I agree with her. Weekly spelling and dictation tests constantly remind the child who struggles with either learning to spell or applying his knowledge, that he is 'not a speller'. These tests are often done quickly, first thing in the morning, and the marks recorded. This belief in their inability to succeed in spelling becomes engrained and will affect the child's attitudes and resilience in future spelling and writing tasks.

Common spelling error patterns

Levine (2003, p 177) outlines some common spelling errors which could indicate where, in the learning process, the student experiences difficulty, thus revealing his '…neurodevelopmental profile' (*ibid*, p 177). I have taken these errors and linked them to the concepts of attention, prior knowledge and working memory. The table below summarises these links. Although I will not analyse these spelling difficulties with the participants of this study, I believe the kinds of spelling errors that Levine highlights shows that all the concepts of learning (attention, prior knowledge or working memory) are present and intricately linked in the process of learning to spell and in the application of that knowledge. I believe motivation (or lack thereof) plays a significant role in the learning process, and this can be seen in the kinds of errors a child might make. Any sense of failure, difficulty, success or sense of achievement the child experiences in any of the areas of learning will surely affect their future attempts at accurate spelling.

ERROR PATTERN (Levine, 2003)	LEARNING CONCEPT (my link)
Visually close, phonetically poor approximation (e.g. *barght* for *bought*)	Prior knowledge – poor phonological awareness
Phonetically close, visually poor approximation (e.g. *bawt* for *bought*)	Prior knowledge – weak links to, and between, knowledge chunks Working memory – poor visual pattern matching linked to poor recall of stored knowledge
Accuracy on a spelling test, but inaccuracy within sentences, paragraphs	Working memory – cannot hold onto accurate spelling, his idea for the sentence/paragraph, getting his thoughts down on paper, punctuation, other aspects of writing. *(This is the aspect of spelling that initiated this study)*
Random, inconsistent errors	Attention – lack of focus Working memory – lack of attention diminishes working memory's capacity
Omissions and distortions within words (e.g. *bohght* for *bought*)	Prior knowledge – cannot remember the whole word Working memory – may have trouble remembering information in a linear fashion, which is needed for spelling (how one letter follows the other)
Spelling rule and regularity violations (e.g. *bugnt* for *bought*)	Prior knowledge – cannot remember the rules governing spelling Working memory – does not see that the word is incorrect as he does not have a memory of the spelling pattern or rule to match the word against
Word derivation errors (e.g. *preevyou* for *preview*)	Prior knowledge – shows a lack of understanding of the deeper structures of language. Fails to use word knowledge to support spelling
Extreme disparity between spelling recognition and spelling recall	Working memory – fails to make accurate pattern matches Prior knowledge – the neurological links are weak, perhaps from a lack of practise, or perhaps from practise that is not meaningful to the child Attention – perhaps a lack of attention when initially learning the letter-sound connections, or perhaps he was not developmentally or cognitively 'ready' to deal with the abstract concept of oral language being represented by written symbols
Mixed spelling errors	Attention – unfocused attention to the task will lead to errors Prior knowledge – the neurological pathways in the brain may not be strong or well-used Working memory – unfocused attention may reduce the capacity of working memory, resulting in spelling errors being made.

Figure 9 - Table showing the links between common spelling errors (Levine, 2003, p 177) and the main concepts of learning

Conclusion

There is so much more to applied spelling than initially meets the eye. I understand the ULM to say these young boys are capable of both learning and applying spelling, *provided* they direct focused attention to the task in order for working memory allocation to be optimal. Learning is all about linking - through pattern matching and retrieval (Shell *et al,* 2010). Sufficient opportunities to practise must be given in order to strengthen the neural pathways (Furth, 1969; Vygotsky, 1978; Shell *et al*, 2010). These activities need to be novel enough to maintain attention and varied enough to makes links between many knowledge chunks. They also need to be meaningful and age appropriate. This, in turn, is enhanced if the expectation is to succeed. If motivation is high, attention will be focused, working memory's capacity to hold information will be increased, working memory's allocation will be high and learning will happen. Even if the task is perceived as being difficult, high motivation will ensure that the effort required is applied over the time it takes to complete the task or learn the spelling. The child needs to be *ready* to learn to spell – intellectually, cognitively *and* affectively. Experiences of success will lead to more success. Experiences of persistent failure may lead to the child giving up. Yet, even in the face of consistent difficulty, some children persevere and do not give up. Even if they are not as successful a speller as their peers, these children continue to strive to find ways to become 'good spellers'.

Spelling '…presents a vexing challenge to young writers, as it calls for a unique blend of language ability, memory capacity, understanding of rules…and attention control' (Levine, 2003, p 176). Spelling is not a simple act. It requires many mechanical abilities (such as holding a pencil or knowing how to shape a letter). It requires the child be ready to process the conceptual aspect of spoken language being represented by symbols. It requires the child to be able to manipulate these symbols and sounds to communicate what they want to communicate. It requires the child to be emotionally ready to cope with making sense and meaning of other peoples' words and actions. It requires the child to be emotionally ready to make mistakes and be able to cope with the feedback of their efforts. And every experience is attached to an emotion, feeling or personal judgement on how the child perceives they have done, which will affect their level of energy they put into future, similar tasks. Add to this mix the fact that each child brings to the classroom their own mixtures of readiness to learn, and where the language of instruction assumes a level playing field of comprehension. There are many areas where things can go wrong. It is not the aim of this study to diagnose where things have gone wrong,

nor where things have gone right. I hoped to be able to uncover some of the reasons for poor application of spelling, and to keep the focus on the *kind* of motivation that helps the student persevere, or, on the contrary, that leads to the student giving up.

If 9- and 10-year-old boys are capable of learning and applying spelling why is there a such disconnect between learned spelling and applying that knowledge to different types of classroom writing? I understand now that the *ability* to spell (prior knowledge and working memory) is not the only thing to affect the successful application of spelling. Motivation, whether it be a set of beliefs around spelling in general, the ability to set and value goals for spelling success or the expectations of future success / failure, or the relationship a child has with their teacher, plays a very big part in sustaining the student's levels of effort in tasks they finds difficult. The student may experience physiological difficulties (such as poor processing speed, poor auditory processing or may have a poor working memory) yet may still persevere with spelling. Others who experience the same difficulties may simply give up. Some students appear to have age-appropriate processing speeds, auditory processing abilities and working memories, yet do not seem to have the levels of perseverance needed to learn things they find hard.

Levine (2003, p 176) observes that '…spelling may be thought of as a conspicuous indicator of your intellectual worth. Put simply, kids who can't spell feel terrible.' Spelling is an emotional activity. I believe the key to understanding the disconnect between learned and applied spelling lies in understanding the role of motivation in this process. This study has helped me develop a deeper understanding of how motivation can affect the application of learned spelling, irrespective of whether the student has underlying physiological difficulties or not. What I found to be of importance to achieving this understanding was to listen for the language the participants use when speaking about their experiences around spelling; their beliefs around both their abilities as a speller and their attitudes towards the importance of spelling; and I needed to give time to reflect on their responses about what motivates or demotivates them.

CHAPTER 6: A tool for making sense of the data

In this chapter, I will bring together the findings of the literature review to form a conceptual framework within which to make sense of the data collected. The key concepts of this study are those associated with the processes of learning – working memory, prior knowledge, motivation and attention. The diagram below shows how these concepts fit together. I have separated motivation out for ease of explanation, although it must be borne in mind that motivation is the third part of the learning process (c).

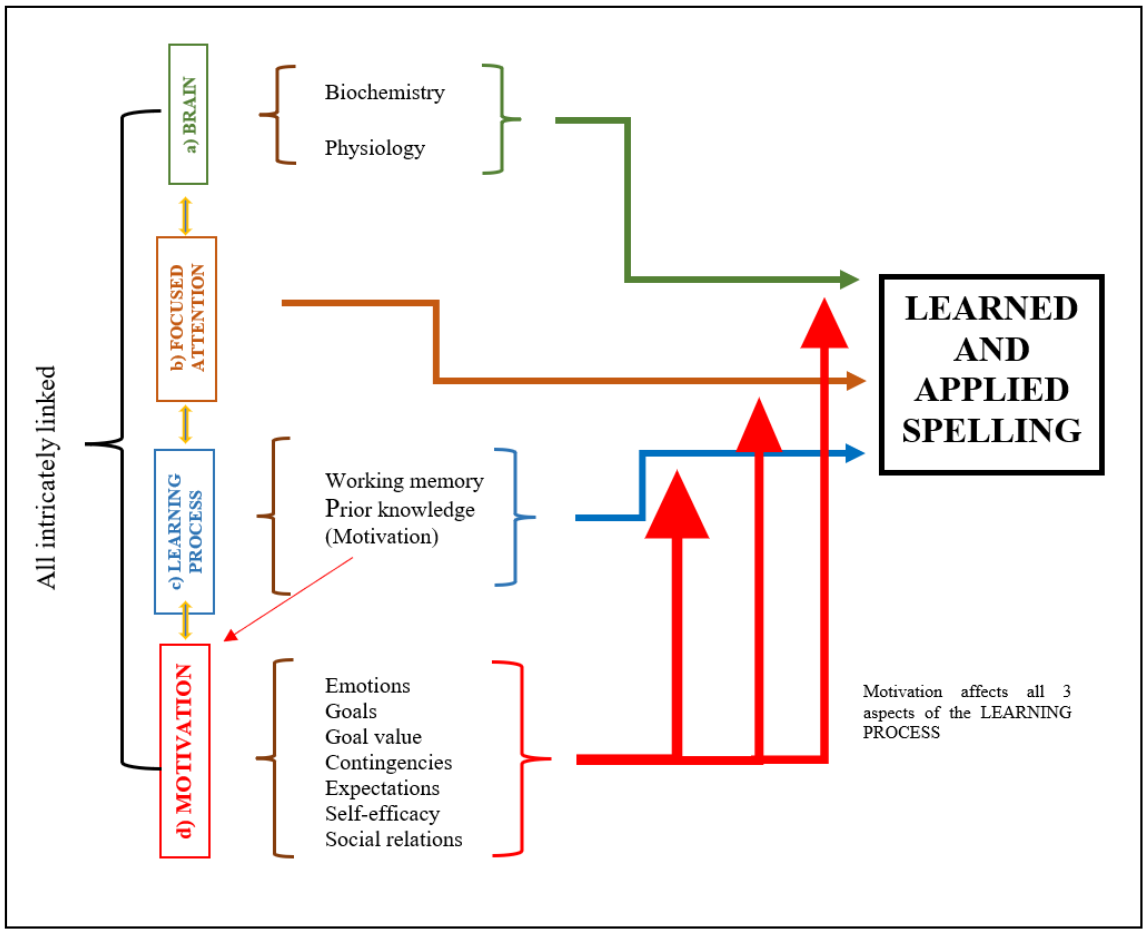


Figure 10 - How motivation influences attention and the learning process

a) The biochemistry and physiology of the brain form the genetic aspects of the child with which they are born. Although they affect the brain function, they will not form a part of this study. The biochemistry of the brain is outlined by the ULM model (see Chapter 3) which considers learning at a neurological level - if the structure of the neuron has not changed, no learning has taken place, irrespective of the processes of learning

(either Piagetian or Vygotskian). The ULM used sophisticated technology with which to observe how the brain works on the neurobiological level. This kind of technology was not available to either of Piaget or Vygotsky. The physiology of the brain will determine any barriers to learning the child may have – such as a slow processing speed, a poor working memory or any issues with auditory processing. The biochemistry and the physiology of the brain will influence the abilities of the participants in this study. Some of the boys have no diagnosed physiological barriers to learning yet struggle to apply their knowledge of spelling; others have been diagnosed with barriers to learning such as poor working memory / slow processing speeds / poor auditory processing yet are able to apply their knowledge of spelling. Although these impairments have an influence on motivation, in that a child may experience emotions such as frustration at not being able to master reading or spelling as easily as their peers have done, motivation does not have an influence on the impairments as they are biological in nature. The child does not have control over their impairments.

b) The learning processes are those concepts outlined by Piaget and Vygotsky and summarised by Shell *et al* in the ULM. The ULM model is a useful tool by which to study how these concepts are linked, as the model brings the concepts of attention, working memory and prior knowledge together under its three principles and five rules of learning (see Chapter 3). The ULM summarises the learning process by describing the connections between working memory, attention and prior knowledge (the learning process) in the first two Rules of Learning (see Chapter 3):

    i. Learning is a product of working memory allocation. No learning happens without working memory, as this is the process by which the child holds up the new information against what they already know, assimilates it into their schemes of knowledge, or accommodates it by changing their schemes of knowledge. For working memory to function effectively, the child must pay attention to, or focus on, the new information. Shell *et al* (2010) describe attention as referring to '… how many of the elements in working memory storage can be focused on at any time despite the distractions and interference' (Shell *et al*, 2010, p 3). Shell and co-authors argue there are four storage areas, or slots, within the temporary storage space that is working memory. Each slot can hold onto varying sizes of knowledge

chunks. The more focused the child is on the task, the more slots are filled, and the more knowledge they have at their disposal to solve the task on hand.

ii. Working memory's capacity for allocation is affected by prior knowledge. The more consolidated and automatically available the prior knowledge, and the bigger the networks of schemes of knowledge, the more working memory can hold onto while the child manipulates the information needed to complete the task. This gives the child a much better opportunity to retrieve similar information to the new stimulus, and to assimilate or accommodate the new information into their schemes of knowledge.

The ULM suggests that working memory has three functions that are key to effective learning (see Chapter 3). The first function is that of pattern matching. Here, the function of working memory is to hold up the new information against prior knowledge. If there is a link, working memory will retrieve this knowledge and any other information linked to that knowledge (knowledge chunks / schemes / networks).

The second function, then, is to retrieve these knowledge chunks and bring them into the working memory space. The ULM model suggests that working memory has four slots (a temporary storage area where the new information and the retrieved information will be held) while the child thinks about and manipulates the information needed to complete the task.

While the child is engaged with this activity, working memory will create more links between the knowledge schemes and the new information, thus fulfilling its third function, that of linking information. The more often the neurological pathways are used for any of these functions, the stronger the pathways become, and the easier it is to fire up the neurons. Both Piaget and Vygotsky agree that learning cannot take place without focused attention at the start of the task. This attention is affected by motivation – which includes emotions such as anxiety, fear and pride (see diagram 1 in Chapter 4 and point 'c' below). High levels of anxiety or fear would negatively affect working memory's ability to identify the new information and to access the corresponding patterns in long term memory. In addition to this, feelings of anxiety or fear would be

linked to learning to spell or applying spelling, and would be remembered in future spelling-related tasks. In a similar manner, pride, or any other positive emotion related to success in spelling, would also be linked to spelling tasks, thus increasing willingness to engage with spelling tasks in the future. Both Piaget and Vygotsky agree, too, that attention to the task will influence how much working memory is used at any one point in time. The more attention the child pays to the stimulus, the more effective the matching, retrieving and linking will be.

Piaget calls prior knowledge schemes of knowledge. The bigger and better connected these schemes of knowledge are, the more easily the child can assimilate the new information into his existing schemes, and the better able he will be to accommodate any conflicting information presented should assimilation not take place. Vygotsky's concept of the ZPD encapsulates the same idea by postulating that prior knowledge is the basis from which a student would start as he progresses to the higher level of understanding with the help of a more knowledgeable other. Both theorists agree that understanding and learning will occur through practice that is meaningful, and if enough time is given to consolidate the concepts being taught.

The third function of working memory is to hold the information and knowledge together long enough for the child to manipulated the information and knowledge until they can produce a product. This product could be a new network of knowledge, or it could be something such as a sentence, or the answer to a Maths problem.

The following point includes both sections (c) and (d). Section (d) was separated out for ease of understanding and should be read together with the section on learning.

c) Both Piaget and Vygotsky theorise about how learning is influenced by *motivation*. The ULM model links motivation to the learning processes in third Rule of Learning (see Chapter 3):

   iii) Working memory allocation is directed by *motivation*. Motivation affects the amount of energy the child will put into their learning experience. If the child is reluctant to engage with the stimulus or new information, for whatever reason, they will not make use of the full potential of their working

memory. As working memory is necessary for any learning to take place, it is easy to see just how important motivation's role in learning is.

Rule number three was the one that caught my attention right from the start. Where Piaget and Vygotsky argue that motivation (Piaget's affect; Vygotsky's affect and emotions) and cognition (learning) were different but inseparable processes, the importance of the *role* of motivation in learning was highlighted for me in the ULM. As mentioned above, the ULM model suggests that working memory has four slots where it can hold and manipulate information (see Chapter 3). Each slot is occupied by a network of information (a scheme of knowledge or knowledge chunk) while the new information is being matched and linked to prior knowledge. As Piaget and Vygotsky have theorised, any negative emotion, experience or uncomfortable feelings the child may have that is connected to these schemes of knowledge will influence how much energy they will put into the task. If these slots are then occupied by knowledge chunks associated with any negative experience, the child will not pay close attention to the task as their motivation to do so is limited. This reduces the effectiveness of working memory to function at its best. How working memory's capacity could 'shrink' (my word) through the influence of negative feelings, low expectations, poor self-efficacy or poorly-valued goals changed the way in which I saw the role of motivation in learning.

The ULM model brings together all the known information about motivational influences, incorporating both theorists' ideas on motivation, and brings these ideas under one heading of 'motivation' (see Chapter 3). I believe these categories of motivation will be a useful tool by which to analyse the participants' responses in this study.

Within the context of this study, I want to investigate the aspects of motivation that could affect what a child knows and what they choose apply. This is illustrated by the red section of the diagram (motivation). The biochemistry and physiology of the brain will affect the mechanical learning of spelling and will therefore influence the quality of the child's knowledge. Yet this study is not concerned with how spelling is taught and learned as the boys I teach all have age-appropriate knowledge of phonics and language. This study is investigating why a child, who

has no diagnosable barriers to learning as far as the brain function is concerned, still struggles to apply their knowledge of spelling.

I have drawn on the concepts of the learning process and motivation put forward by Piaget and Vygotsky and have used the model the ULM developed to bring all the concepts together (see diagram 1). The conceptual framework illustrated above will enable me to investigate the main research question – that of the role of motivation in applying spelling knowledge.

I believe the conceptual framework outlined in this chapter will enable me to better analyse and understand the last two sub questions:

- How do Grade 4 boys feel about spelling and writing tasks?
- How do these boys feel in response to spelling and writing tasks?

The framework helped me place emotions around and beliefs about spelling into better perspective with regards to the learning process, and how motivation affects what a child *can* learn and what they *choose* to use.

Conclusion

Both Piaget and Vygotsky are clear that motivation is intricately linked to learning. Piaget provides information as to the development of affect (motivation) in young children which will help me understand what the participants may be capable of at this age. Vygotsky has helped me understand the importance of language; the importance to the child of making meaning of both his environment and what he is required to learn; and the importance of developing sound intrapersonal relationships as well as interpersonal relationships. The ULM model acknowledges the same concepts of learning as have previous educational and developmental theorists such as Piaget and Vygotsky - the construction of knowledge and the role of memory in learning. The ULM linked these concepts together in a model that highlighted motivation's role in learning and provides a categorisation of the various aspects of motivation that could affect how a child chooses to apply their knowledge. I believe this categorisation of the motivation will be a useful tool to use when analysing the responses of the participants.

In this study, I used this conceptual framework to take a closer look at the difficulty some Grade 4 boys experience in applying their learned spelling. There are many factors that can influence how spelling is learned (see Chapter 5), but I am curious to find those factors that influence how it is applied. I believe understanding the role of motivation in the learning process will provide that key.

CHAPTER 7: The plan of action

In this chapter, I will outline the methods used to conduct this research study. A deeper understanding of the ways in which both Piaget and Vygotsky saw the role of motivation in learning, together with the way in which the ULM model summarised and linked the concepts of learning together, has shifted my perspective of how classroom learning happens. The ULM model gave me new insight into the importance of both working memory and motivation in learning which made me reconsider what I knew about spelling, how it is learned and what could affect its application. Learning spelling is highly personal and heavily influenced by the time and place in which the child finds themselves. I hoped to understand the phenomenon of motivation, not to judge the participants regarding their beliefs and abilities, and not to try and remediate, or fix, anything. It is my considered opinion from experience that, although we do understand *how* motivation can affect learning, I do not believe we appreciate the *level* to which motivation can affect learning. To understand this, I needed to have a deeper understanding of what motivation is, what it means to the individual boy and to what extent it spurs the boy on or holds him back. The methods involved in teaching spelling, whether it be the whole-word method or the phonics method, mention motivation in the form of personal interest, kinaesthetic-tactile movements and opportunities to practise included motivation as a large component of learning to spell (see Chapter 5), but I did not find much information on how the children chose to apply their knowledge of that learned spelling. I needed to understand, not only the effects of motivation in general learning (put forward by Piaget and Vygotsky) but also how motivation affected the choices the boys made in a specific area – that of applying learned spelling to their written work.

Research Paradigm

McMillan and Schumacher (2010) describe qualitative research as being "...concerned with understanding the social phenomena from the participant's point of view" (p 12). This study is concerned with understanding the role motivation plays in the learning and applying of spelling by Grade 4 boys. Because each boy constructs his own reality with regard to the phenomenon of spelling and applying it, this reality is highly personal and subjective. This study, therefore, uses a qualitative method of research.

There are many forms of qualitative research (Merriam and Associates, 2002, p 6[5]), but I have used a basic interpretive approach which, I believe, will yield the best results for my inquiries. Although there are elements of phenomenology in this study, in that I will be looking at the phenomenon of learned and applied spelling, I did not focus on the essence of the spelling experience of these boys. Neither did I want to focus on the history of each child's learning experiences (narrative analysis), although I needed to consider these experiences as they have shaped the boys' beliefs around their abilities to spell. My focus was to understand their thoughts and feelings around spelling specifically at this point in their lives. Grounded theory was not entirely suitable either as I was not trying to build a theory from the results - I only want to understand the disconnect between learned and applied spelling. As this is a small sample of participants, researching by case study and ethnographic study was not suitable as both these approaches call for an in-depth description of the problem within a group, and a socio-cultural interpretation of the results.

Merriam and Associates (2002, p 3) point out that qualitative researchers are curious about how individuals interpret their worlds at a particular point in time and within a particular context. This implies that the interpretations can change, that they are not fixed. The young boys who formed the group of participants for this study were just starting to write creatively within a more formal framework of writing expectations - clear and logical sentences, appropriate use of punctuation and correctly applied spelling. In previous grades, the emphasis was more on getting their thoughts onto paper, and "creative" spelling was tolerated as they explored the different combinations of letter-sound connections that English has. This led me to believe that quantitative research methods would not suit this kind of enquiry either as there are many elements that can affect both learned and applied spelling. There was not just a single entity to be studied (which quantitative research requires).

Merriam and Associates (2002, pp 18 - 21) outline five characteristics that are critical to qualitative research. They are trustworthiness, validity, authenticity, reliability and ethical conduct. In addition to these, McMillan and Schumacher (2010) argue that objectivity, precision, verification, parsimony, empiricism, logical reasoning and scepticism are also key to conducting an inquiry that can add to the knowledge base of its field, and that can also be of

[5] I acknowledge, here, that there is a second edition of *Qualitative Research in Practice. Examples for Discussion and Analysis (2019).* However, I have used the first edition of this book (2002) in this study.

use to future researchers or educational practitioners. All these characteristics can be achieved if the researcher follows the guiding principles outlined by McMillan and Schumacher (2010, pp 6 - 8):

1. McMillan and Schumacher (2010, p 6) claim that the problem to be investigated needs to pose significant questions that can be investigated empirically. I drew up a list of questions which were aimed at revealing the boys' the difficulties around spelling; the strategies they used / did not use; their values regarding accurate spelling; their abilities or inabilities to accurately apply their knowledge; factors affecting their willingness to continue to engage with spelling; and to gauge the boys' metacognition involving spelling. These questions were put to each of the boys, whether in their respective groups, or on their own. The collective answers helped me code and analyse their responses.

2. The second guiding principle for a valid and trustworthy inquiry, as argued by McMillan and Schumacher (2010) is that the problem of the study must be based in the literature around the main question. As I was conducting an inquiry in the educational field, my research must be grounded in the literature and theories pertaining to learning in the classroom. This means I needed to address learning, how it happens, what affects it and how it is applied. The literature around motivation in learning, as discussed in Chapter 4, confirms that motivation is critical to learning and cannot be separated from cognitive and intellectual development. I argue that a better understanding of motivation in spelling will benefit both teacher and student.

3. The third of McMillan and Schumacher's principles (2010) refers to the methods the researcher uses to conduct the study. These need to be appropriate and best aligned to investigating the main question. As this study involves dealing with the boys' personal and subjective view of learning and spelling, I believed the qualitative approach using interviews, direct observations and discussion with the participants about the evidence of work produced by the participants would result in findings that offered insight into the problem, as well being trustworthy and reliable.

4. McMillan and Schumacher (2010, p 7) argue that the study needs to provide a coherent and explicit chain of reasoning. I believe I have been able to offer this as I collected my

data through the methods outlined above and analysed it according to the framework described in a Chapter 6.

5. McMillan and Schumacher's fifth guiding principle (2010, p 7) claims the study should be able to be replicated / generalised across future studies. I argue that the part of this study that outlines the role of motivation in learning may be applied to other studies, but as the results will indicate the participants' thoughts and feelings around spelling at this particular time of their lives, future results may not be the same as the findings of this study. This is because so much of it is personal and changeable - aspects of a study that cannot be replicated.

6. Finally, McMillan and Schumacher (2010) argue that the study needs to be disclosed so it can be critiqued and evaluated by other professionals. The thought of being critiqued by my peers and other professionals guided my thoughts, interpretations and findings to be as trustworthy, valid and reliable as possible. Accountability was key to conducting a study that I want to be taken seriously.

The Context

I have worked in academic support for many years. I have dealt with children of primary school age, from Grade 3 to Grade 6, assisting with reading, writing, spelling and Maths. It has long been my opinion that there is an underlying issue I have been missing all this time. Although some of the children I have taught had physiological difficulties, such as a slow processing speed or a poor working memory, I felt there was more to it than that. Many of these children used the strategies taught to them, with good results. Some were not so successful. There did not seem to be a consistency about the results of the interventions I offered.

After reading Dr Carol Dweck's book *Mindset: How You can Fulfill Your Potential* (2012), it began to dawn on me that perhaps attitude, or mindset, could play a more significant role in learning than I had previously thought. I began to ask the teachers specific questions regarding the student's behaviour in class with respect to the subject with which he was having trouble. I also began to ask the students specific questions about their feelings and thoughts about the subject with which they were needing help. Patterns started to emerge around personal beliefs regarding the boys' abilities in specific areas of learning. I began to explore this phenomenon with regard to reading. Around the same time, both teachers and parents were asking the same

question about applied spelling – if the student can spell a word in isolation (such as in a test), why can he not spell that same word in a sentence (such as in dictation) or in other writing tasks in class? For some time now, I have suspected that it has a lot to do with a boy's beliefs about himself as a "good speller" and his attitude or feelings towards a specific subject. By conducting this study, I had hoped to gain a deeper understanding of the role emotions, beliefs, expectancies and therefore motivation, play in students' abilities to apply the conventions of English spelling.

I was conducting the study in the school where I worked, and that put me in the position of being an insider researcher. I needed to be very mindful of certain advantages as well as disadvantages of this situation. As I have worked with these boys before, I already had a good rapport with them, so the time needed to build this connection was reduced. We already had a trusting relationship, and this extended to the parents and teachers of this group of boys.

A possible disadvantage was that I have extended knowledge of the boys and their difficulties, gathered from having worked with them, and from having access to any official reports such as the educational psychological report, or the speech or occupational therapists' report. This could have influenced my interpretations of their comments and behaviour, but I had been given permission from those boys who already had educational psychological to make use of their reports in the study. Reference to the findings of the reports are made as and when the findings influence the boy's abilities around learning to spell. In addition to this, perhaps because the boys may feel that, as I know them well, I would assume knowledge of their difficulties, and they may not explicitly state these in the interviews. To combat this situation, I had to make sure the interview questions are provoking and probing enough to uncover these thoughts and feelings.

During the study, I believe that I was rigorous in my application of, and mindfulness of, the ethical behaviour required in this position of being an insider researcher.

But the overall context was not the only context I needed to be aware of. Each boy brought to the study his own context. This is highly personal, situational and referred to a particular time of his life. Not all participants grew up using English as their primary language. Some boys in the study grew up speaking isiZulu or isiXhosa and one spoke Dutch. Most of the boys now, at this age, do speak English as their home language – but their language foundations were not

purely English. I needed to form the interview questions carefully so that the questions would help reveal as much of the boy's context as possible, without being intrusive. Contextual aspects such as his home life, the attitudes and beliefs of his parents and family around learning and spelling, how he perceives the school's attitude towards spelling and even how he sees himself in comparison to his peers would all influence how motivated the boy would be to persevere at spelling. Geertz (1973, p 14) emphasizes this in his argument that context is something that needs to be 'thickly described' so that the phenomenon can be more deeply understood. Having the detail of the boy's context helped trace his story (Geertz, 1973, p 19), which in turn helped me form the categories by which I will inspect the data.

Sampling

At the start of this study, I worked with a group of between twenty and twenty five boys in my role as academic support teacher at the school. The participants all attended a private primary school in Johannesburg, and all of them spoke English at home, although the group is racially diverse. While some boys were first language English users, some boys spoke more than one language, and, although they spoke English as their familys' language of choice, their parents' first language were different. In other words, the latter group of boys were using and speaking English as a second language. Where applicable in the forthcoming data chapters, this is pointed out.

Some of the boys have had an educational psychological assessment done, which would give results such as a processing speed and may reflect the working memory functioning. Some boys in the group have been diagnosed with ADD, while others have been identified as having poor processing speeds or poor working memory. I invited all 25 of the boys in my support group to take part. Of those 25 boys, 18 agreed to take part in the research. This group comprised: boys who had no diagnosed impairments to learning and some who did; boys whose home language was English, and some who had grown up with a different home language, yet who spoke English at home at the time of the interviews; boys who were cognitively strong in other school subjects, and boys who found all areas of school learning hard. All 18 boys in the study found spelling, in all of its aspects, difficult to learn and apply. It was a diverse group, and one that I felt would give me the greatest chance of understanding the role of motivation in learning to spell and applying that knowledge.

The table below gives a summary of the participants' language background and diagnosed impairments to learning. The participants in groups 1 to 4 elected to be interviewed in groups, while Bob, Will, Beckham and Mist preferred to be interviewed on their own.

	CHOSEN PSEUDONYM	NAME IN THE REPORT	ENGLISH FIRST LANGUAGE	ENGLISH SECOND LANGUAGE	PSYCH-ED REPORT	IMPAIRMENTS TO LEARNING	CHOOSES TO READ
Group 1	George Nichols	George	✓			Treated for anxiety and lack of attention	No
	Ninja Lloyd	Lloyd	✓				Yes. He has also learned to read in Dutch, his mother's home language
	Johny	Johny		✓			No
	GG Fortnight Slayer	GG		✓	✓ Not available to the school		No
Group 2	Black Panther	Panther		✓			No
	Steve Rodgers	Steve	✓		✓ Not available to the school	Diagnosed with ADD	No
Group 3	Jack Sparrow	Jack	✓				Yes
	Tony	Tony	✓				No
	FN2187	FN	✓			Treated for lack of attention	Only if the reading is related to either of the two World Wars
	Thomas Hunt	Thomas	✓		✓		No
Group 4	Moo	Moo	✓				No
	Big Shaq	Shaq		✓			No
	Spiderman	Spiderman		✓			No
	Oliver Creen	Oliver	✓				No
Individual interviews	Bob Jefferson	Bob	✓				No
	Will	Will	✓				No
	Beckham Linguard	Beckham	✓			Poor eyesight	No
	Mist	Mist	✓		✓	Treated for anxiety and lack of attention	No

Figure 11 - Table showing the participants' details with respect to what may influence their abilities to learn and apply spelling words

Data gathering instruments

The researcher

The researcher in a qualitative study is the instrument of data collection. She observes, interprets and analyses the data, finding correlations and relationships between it all. Often, she is able to collect and interpret data as it happens, so her methods of collection and recording need to be varied and organised. Delamont (1992) sums up this role when she says (p 9): "Each researcher is her own best data collection instrument, as long as she is constantly self-conscious about her role, her interactions, and her theoretical and empirical material as it accumulates. As long as qualitative researchers are reflexive, making all their processes explicit, then issues of reliability and validity are served." Geertz (1973, p 20) suggests that the researcher writes everything down. In this way, she will be able to preserve her observations and accounts. The researcher can also use a cell phone or other recording device on which to record her observations for future study. Either way, the researcher must bear in mind that her recorded accounts are only a partial understanding of the phenomenon. After all, only the child himself will fully understand his situation. A wider, deeper understanding of the phenomenon can be gained from careful enquiry, reflection and reflexivity on the part of the researcher.

As one such researcher, I understood the ethical issues of making sure no harm came to any participant in the study, which meant that all my processes of data collection had to be transparent, valid and rigorous, with all permissions granted for the participants to be involved.

In addition to this, the insider researcher needs to be aware of 'researcher bias' (Fleming, 2018) where the researcher's own experiences and values could influence the research questions, the data collection or the design of the study. Part of the research design was influenced by the environment I was in at the time of the study, and the availability of the boys selected for my sample. I also understand that the study could have been compromised because I did not include girls in the study. However, I have already explained my choice (see *Sampling* above). Another aspect of the ethical practices in this study to consider was the possibility that my insider knowledge of the boys and their school and home backgrounds could influence the way in which I analysed their responses to the questions. I had to make sure that, in order for the study to have credibility, I needed be extremely thorough when interpreting the data.

Fleming (2018) highlighted other situations that could influence the ethical validity of this study. She noted that the participants may be influenced by the way they feel toward the researcher, and may not answer truthfully. I needed to make sure I did not come across as confronting or judgemental in any way. The fact that I had worked with this group of boys before, helped strengthen the trust in the researcher-participant relationship. Fleming also pointed out that, similar to the feeling of being judged by the researcher, the boys may not answer the questions truthfully for fear of being judged by their peers. This was overcome by offering the boys the choice of being interviewed alone, or within a small group of no more than 4 boys.

Privacy could also be a potential problem with being an insider researcher. Both the letters to the parents and the participants at the start of the study addressed this issue. In addition to this, at the start of each interview session, the boys were reassured that what they said during the interviews stayed with me and the University only – nothing would be divulged to the staff at the school, nor their parents.

Delamont (1992, p 6) warns against only having one form of data collection. I conducted 8 interviews in all with the boys – there were 3 groups of 4 boys each, 1 group of 2 boys, and 4 individual interviews. I was also able to the boys' psychological reports where available and with permission. While I understood that the more sources of data collection I had, the better and deeper my understanding of the boys' contexts would be, observation of the boys' behaviours in class and the collection of written work proved to be extremely difficult. A summary of the boys' pseudonyms, their home language and their impairments, of lack of impairments, to learning can be found in Figure 11.

Delamont (1992) also emphasises the importance of the researcher's relationship with the participants (p 8). She says "...good research is highly tuned to the inter-relationship of the investigator with the respondents". I have worked with these boys for a year now, and I believe we have a good relationship together. I was mindful, throughout the interviews, to make sure that the trust we shared was kept intact. Our already-established relationships meant that the initial time required for building trust was reduced.

Another important characteristic of a qualitative researcher, according to Delamont (p 8), is that of reflexivity. Reflexivity is the need on the part of the researcher to understand her own

biases or areas of subjectivity, and instead of trying to eliminate them from the study, she should make them visible and understand them. Delamont calls this reflexivity "... a social scientific variety of self-consciousness" (p 8). I made sure to consider all other sources of information about each individual, such as the results of the psychological assessments, or my own prior knowledge of each of the boys, yet not let this skew my responsibility to listen to *their* story and reasons why they have constructed their beliefs around their ability to spell consistently and accurately. Geertz (1973, p 7) cautions the researcher to be aware of how she interprets behaviours and responses – it cannot be from the researcher's point of view. However, a deep, contextual knowledge of the boys helped me to be impartial. In this study, the focus was on motivation and its role in applying knowledge. As I have mentioned before, motivation, working memory, prior knowledge and attention are all intricately linked (see Chapter 2 and Chapter 3). I was careful not to attribute all my findings to only motivation (Geertz, 1973, p 9) – in fact, the findings indicated that there was more than one source of influence on the boys' conscious choice of words in written tasks.

All through the process of the study, be it in data collection or interpretation, I was present in the moment of observation, reflexive of all thoughts and actions, transparent, observant, knowledgeable of the theories that inform the study, open to critique and input from peers and my supervisors to ensure I was conducting the research study in an ethical manner.

As my primary method of gathering data was through interviewing the participants, I understand that I had to be a good listener and allow time for the participant to think about his answer. As young children do not always give a straight answer if they are unsure of the question, I had to be flexible in the interviews as the conversations often took a divergent course. I believe my experience in the field of academic support has given me the tools with which to observe and investigate the difficulties these young students are experiencing. I had tried many different strategies and tried to apply many different concepts gleaned from my own informal reading into the subjects of effective learning and application of spelling. I believe this search for solutions has strengthened both my listening skills and my skills of observation.

Trust is another big issue when interviewing young children. I had chosen this particular group of boys as I had worked with them before, and already had a good, trusting relationship with them. I am convinced this helped make the research less threatening for the boys, which, I would argue, made the findings more authentic and reliable.

The sources of data

This study had 2 main sources of data – interviews and documentation.

Interviews

I conducted 8 different interviews: 4 interviews involved groups of boys and 4 were conducted as one-on-one interviews with 4 different individual boys. The interviews took place either in my office or in a room in the library. All the boys were familiar with this setting as they have all had lessons in these rooms over the year. It has been my experience that young boys often prefer to talk in a group rather than in a one-on-one situation with me, as they find comfort in the fact they are not the only ones experiencing problems. Often, one boy will say something such as 'I find spelling really hard', and others will agree and go on to expand on their feelings. Being in a group may also help the boy feel more relaxed and more confident to talk about the things he is finding hard. I was fortunate to have a background knowledge of the boys, as I was able to group the boys such that the boys who did not get on well together were not placed in the same group. I believe this helped the boys' responses to the questions be as authentic as possible in the absence of personality clashes. Some boys preferred the one-on-one interview as they were a little reserved to chat openly with their peers. In the one-on-one situation, I thought it may take a little longer to draw the boy out of his shyness as he may not want to admit to having problems with spelling at all, but these boys were comfortable enough with me that shyness was not a problem.

Although I will have a set of questions to ask each participant, I felt I needed to conduct this interview in a semi-structured format as interviews with young children can often digress from formal questioning. The interviews took the form of a conversation, so as not to sound too much like an interrogation. As McMillan and Schumacher (2010) point out, the strategy used in this type of data collection depends on the context and the purpose of the study (p 355). As I wanted to uncover potentially difficult emotional connections to learning, I needed to be empathetic and respectful, and this is best done in an informal, conversational way with younger children. I needed to structure the questions so that they encouraged "... elaboration of subtle and valid data" (McMillan and Schumacher, 2010, p 360), and do not simply elicit a "yes" or "no" answer. The questions for the interview were designed to put the participant at ease to avoid any feelings of being interrogated, and to elicit as much information as possible without being intrusive. The aim was to develop a deeper contextual understanding of the boy. I understood that I could not think of every question to begin with, but being mindful of this

situation made me aware of when to pursue a question further, when to digress a little or when to stop a line of questioning. Making the participant comfortable involves making it clear he can stop the recording or the questioning any time he feels the need to. A deep understanding of each child and his context would enable me to write a deeper, thicker description of the phenomenon that is motivation.

The interview questions were also aimed at uncovering the motivation / demotivation behind the difficulty with applying what they know and were informed by the different influencers of motivation, as outlined by Shell *et al* (2010). These influences include motivators such as goal value, contingencies and expectancies, self-efficacy, emotions and interest in the task. The participants needed to feel reassured, so I needed to convey to them acceptance of all their answers. This cannot be achieved with young children in a formal style of interview.

All these interviews will be recorded to ensure the reliability of the data collected. I made sure to use 2 different kinds of devices, as 1 of the devices could fail. I had wanted to take notes during the interviews, but the pace of the responses was to quick, so I relied on the devices to capture the words. I the made my notes and wrote down my observations at the end of each interview. All 18 boys agreed to their responses being recorded. It was a technique I used often to assess their reading fluency progress during our school lessons together, and the boys were already comfortable with the activity. The first part of each interview was used to explain why and how I was conducting the research, what it was that I was curious to find out, and to reassure the boys that all their information and identities would be treated in strictest confidence (McMillan and Schumacher, 2010, p 358).

I had to be very aware of the length of the interview, as some young children find it difficult to keep up a focused conversation for very long. This awareness was needed more in the one-on-one interviews. In the group situation, I had to keep close watch on how the conversations progressed, as the groups of boys got side tracked very easily, especially as they are friendly with each other. But on the whole, the boys in both the group and the one-on-one setting were eager to participate, and happy to answer all the questions.

By using interviews with which to collect data, I had to be aware that I might not get the whole story from the participant, so I could only work with what I was given. Each boy brought his own knowledge and use of language to give voice to his thoughts. There were times when I

needed to ask for clarification as to his response. I had to remember I was interpreting a social discourse (Geertz, 1973, p 20). This meant I had to construct the interviews and the questions I used carefully, so that I can elicit as truthful and honest and complete a response as possible. There were times in some of the interviews where I had to rephrase a question as the boy misunderstood what I was asking.

Documentation

There were 2 possible sources of documentation in this study. The first source was the educational psychologist's reports, should these be available. Some of the parents of boys who had had these reports conducted granted me permission to access, and to use, these reports. The second source of documentation was the evidence of each participant's spelling and writing schoolwork, which were not available due to online learning taking place due to the COVID pandemic.

The official clinical reports gave me an indication of any underlying issues that might make spelling difficult and that could point to reasons why the boy has to work so hard at learning or applying his spelling. The documents did not, however, give an indication of what motivates a boy to keep trying, or how he has perhaps given up on being successful in spelling. The evidence of work I recorded during observations was more useful in showing what the disconnect between learned and applied spelling looks like. But again, the reports would not be useful unless corroborated with the interviews and observations. These documents, both official and personal, were extremely useful to me when analysing the data, as they could be affected by any unconscious bias I might have towards the participant or the situation (Merriam and Associates, 2002, p 13).

A Summary of Data Collection Methods

The table below summarises the data collection methods I used.

METHOD	DATA GAINED	INSTRUMENTS TO BE USED
Interviews Interview One-on-one OR group of four participants	. Feelings and thoughts about learning / school in general . Feelings and thoughts about spelling: • Its importance • Learning spelling • Using spelling . Personal beliefs about abilities to spell . Expectancies around success with spelling . Evidence of self-efficacy . Evidence of resilience . Specific reasons for, or causes of, the spelling errors	Recording device • Cell phone • iPad
Documentation Educational psychological reports	. Evidence of physiological problems that could affect spelling: • Slow processing speed • Problems with working memory • Slow auditory processing speed	

Figure 12 - Table summarising the data collection methods for this study

Validity, trustworthiness and reliability

"Claims of validity rest on data collection and analysis techniques" (McMillan and Schumacher, 2010, p 330). By using a combination of interviews and documentation, I believe I was able to gain the best insight into the problem of the disconnect between learned and applied spelling with the participants in this study. Although evidence of work, such as a piece of creative writing or answers to a comprehension done in class, would have given me an insight as to the kinds of spelling errors the boys were making, the boys did reveal these errors during the interviews. For example, difficulties remembering the different sound-symbol combinations of words and remembering the rules that govern spelling were articulated by Lloyd and FN (refer to Chapter 9). These samples of work, however, were not available to me. In addition to this, as the primary instrument for data collection in this study, I understood the need for reflexivity and self-reflection. I also understood the need to seek feedback from my peers as to the type and validity of the questions I ask in the interviews. I sought confirmation from our school psychologist and teachers with whom I worked. My own practice and training were paramount to the validity and trustworthiness of the data I collected. Trustworthiness in

a qualitative study comes from ensuring the following four criteria are adhered to (Shenton, 2004, p 64):

1. Shenton (2004) argues that **credibility** lies in both the choice of data collection methods and within the researcher herself. I believe the methods I chose best suited what I needed to investigate. My experience within the field of academic support, together with the research I had already conducted in my personal capacity before this study began, served me well when it came to analysing and interpreting the findings. By using interviews and documentation, and by corroborating the findings from each of these collection methods, I trust that my interpretations of the data collected was trustworthy.

2. **Transferability**, as Shenton (2004) sees it, is a little more difficult to determine as the data I collected was of a very personal and context-specific nature. However, I do believe that the parts of the study pertaining to the *role of motivation in learning* could be generalised and used for future studies.

3. Shenton (2004) claims that **dependability** will be upheld if all details of the study are made available for scrutiny, and that the recording of the processes of collecting data is detailed and in-depth. It is the nature of qualitative research that the study may not reveal the same results should it be repeated at a later stage with the same participants, and the data that the study is interpreting is context- and time-specific. The participants' construct of their reality of the phenomenon being studied may change as it is very personal. Shenton (2004) argues that if the study is dependable, a future researcher will be able to use what this study has done and repeat it in another context - not necessarily for the same results, but for a similar study (p 71). Records and transcripts of the letters of permission and consent, interview questions and records of observations of this study, are available in the appendices for reference or reading by any other of my peers or researchers. The signed consent forms are not available in the appendices as a precaution to protect the real names of the participants.

4. Shenton (2004) states that for the study to adhere to **confirmability**, "... steps must be taken to help ensure as far as possible that the work's findings are the results of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher" (p 72). This meant all my thinking, reasoning, analysing and

interpretations needed to be correctly reported, and in detail. I believe I have achieved that.

Even if the data I collect was valid and trustworthy, reliability is a little more difficult to ensure as this kind of study is difficult to replicate. The data collected pertains to the participants at this time of their lives, in this context, and in association with the emotions and feelings they have constructed around spelling up until this point in their lives. It could change in the future. I needed to take the big concepts of motivation, attention, working memory and prior knowledge and apply them to a small group of participants. To then go from applying what I find from this small group to a larger generalisation is more difficult. This is where the conceptual framework comes in. If this framework is sound, this is the part of the study that can be used in future situations (Geertz, 1973, p 27).

The question in this study, therefore, was whether "...the results are consistent with the data collected" - because only then can the study be "...consistent and dependable" (Merriam and Associates, 2002, p 27). Furthermore, because I wanted to understand a specific phenomenon in depth, I used a small sample of participants with particular difficulties in a specific area. As such, it will be very difficult to make a generalisation about a large number of participants.

Furthermore, by using a small sample of participants and at this particular age (8- and 9-year old boys), I hoped to gain a deeper insight and understanding of how the motivators of learning influence the ability to learn - specifically, how to learn to apply spelling effectively. I believe that, by gaining this understanding, I will be able to find more effective interventions for students who struggle with spelling. I also believe that if more effective interventions can be offered to students at this early stage of development, the students will be able to learn positive strategies for overcoming spelling difficulties, as well as being able to "unlearn" some negative beliefs about their abilities in this aspect of learning.

Data coding and analysis

"Qualitative analysis is a relatively systematic process of coding, categorising and interpreting data to provide explanations of a single phenomenon of interest" (McMillan and Schumacher, 2010, p 367). In this study, the phenomenon of interest is motivation. But this description of the kind of study I was engaged in was not deep enough. Geertz (1973, p 10) describes it more

fully when he says that a study of something that is so personal to an individual (such as motivation), that is so situated in the present and at a particular point in time is '…a multiplicity of complex conceptual structures, many of them superimposed upon or knotted into one another, which are at once strange, irregular and inexplicit…' Motivation is complex. It is intricately linked to the concepts of memory, attention and building of knowledge – all the concepts involved in the learning process. Working memory, attention, prior knowledge and motivation depend upon each other, they influence each other and, together, they dictate behaviour. It is like a case of the chicken and the egg – it is very difficult to decide, for intervention purposes, with which concept to start, as their relationships to each other are complicated.

I started by looking for "...small pieces of data that can stand alone" - identifying segments of data (McMillan and Schumacher, 2010, p370). These could be a sentence or a phrase that the boys said. For example, Will reported, when asked what words he found hard to remember and spell, were the words he could not easily break down into chunks he knew how to spell. He said: 'so, I can't really break down [words] that well. I'm not really good at breaking down'.

I began with looking for evidence of emotions in the boys' comments. I then moved on to looking for comments that reflected the boys' attitudes and values surrounding spelling. I looked for evidence that could help me understand the boys' perceptions of how their spelling is taught and learned, the strategies they might use and expectations of success in spelling and writing tasks. I looked for evidence that would indicate to me the boys' senses of self-image, self-esteem and self-efficacy with regards to spelling and writing. I looked for evidence of the different sources of negative influences on the boys' attitudes towards learning and applying spelling. Geertz (1973, p 9) calls this '…sorting out structures of signification'.

Each of the segments of data referred to in the previous paragraph was then coded. Codes give meaning to the segments and brings the segments together under a specific label. A sample of the codes I used is as follows:

- Effort. This code was further broken down into:
    - Effort – hard
    - Effort – easy
    - Effort – will get marks
    - Effort – will pay off

    - Effort – need more
    - Effort – will put more in
- Emotion. This code was further teased out into:
    - Emotion – anger
    - Emotion – general anxiety
    - Emotion – anxiety over marks
    - Emotion – anxiety in the test
    - Emotion – excitement for the task
    - Emotion – pride
    - Emotion – relief
- Knowledge. This can be further divided into:
    - Knowledge – lack of conservation
    - Knowledge – lack of basics
    - Knowledge – of self
    - Knowledge – of language conventions

These are only a few samples. In all, I had over 300 categories of code that helped me make sense of the data.

I then grouped the codes into categories that reflected a main idea. The categories that came out of this part of the analysis were:

- Effort
- Knowledge
- Motivation
- Practice
- Spelling
- Working memory

I then cross-coded the data as the data often fell into more than one category. For example, using only the comment from Will mentioned above (‘so, I can’t really break down [words] that well. I’m not really good at breaking down’), the meaning of his words could fall under the labels of:

- Emotion – lack of confidence

- Knowledge – lack of conservation of words
- Knowledge – lack of prior knowledge of sound-symbol relationships
- Motivation – contingencies
- Motivation - expectations

What is important in a qualitative study such as this one, is to find the *meaning* behind the behaviours and responses (Geertz, 1973, p 10). It was important to understand the *meaning* of the role of motivation, and not to simply find examples of motivation in the participants' responses. Meaning can be found in the details. Therefore, it was important to gather data that would help develop this deeper understanding of the meaning of the role of motivation in applying spelling knowledge. For example, the term 'motivation' can be interpreted on different levels. 'Motivation' could refer to the energy it takes to for the child to begin an activity (Piaget's 'affect' – see figure 5); 'motivation' could refer to the interest aspect when planning an activity or lesson; it could refer to reward or encouragement; it could refer to resilience when faced with a difficult task; or it could refer to the sense of purpose that comes from understanding the meaning of the activity the child has to complete. I needed to understand the *meaning* behind the motivation to act, behind the choice the child makes when choosing to apply his knowledge of spelling to his writing tasks. This could only come through a detailed, deep, contextual understanding of the child's context.

The limitations of this study

All the participants of this study have problems with spelling - either learning it or applying it to writing tasks - and all are boys. As a result, the findings cannot be generalised to include all children of this age group irrespective of gender. Nor can it include children who do not have identifiable problems with spelling, but only exhibit the occasional difficulties with spelling. In addition to this, the participants in this study speak English as their preferred language at home, although some are bilingual or even multilingual. Again, the findings of this study cannot simply be generalised to include children who use English as their second language.

Ethical considerations

Ethical clearance to conduct this study was obtained from the ethics committee of the University of the Witwatersrand. The ethics clearance reference for this study is

2018ECE025M. In addition to this, I obtained permission to conduct the study at the school, with boys who were currently pupils at the school, from the Executive Headmaster and Preparatory School Headmaster of the school at which I would worked.

As participation in this study was voluntary, and as the boys were still very young, I needed to obtain informed consent from both the boys and their parents. The participants and their parents were assured of confidentiality and anonymity. They were also assured that, as the data was being used for the purposes of completing a PhD degree, it would be used for academic purposes only. The completed forms would not be included in the appendices as this could inadvertently reveal the participant's name. Throughout the study, I used pseudonyms for each boy.

The interviews were be conducted at a time and place convenient to the boys. As the boys had very full timetables, enough time needed to be given to the boys and their parents when setting the date and venue for these interviews.

As this study involved the perceptions and beliefs of young children, I intended to be non-judgemental and neutral as far as their responses to the questions were concerned. I was mindful of the delicacy of the human ego, and I believe I conducted the interviews with empathy, understanding and flexibility.

Further ethical considerations of being an insider researcher have been discussed in the section *The Researcher* (p 130)

Conclusion

With this study, I hoped to understand motivation *by the role it plays* in a specific area of learning – that of applied spelling. By building up the knowledge gained from the individual responses to the interviews, questions, observations and available documentation I hoped to grow my understanding of motivation and its role in learning. It was, however, not enough: to simply establish trust and rapport with the participants; to select the group to participate in the study; to takes notes and recordings, and to transcribe these recordings; to study the psycho-educational reports; and to code accurately and deeply. Geertz (1973, p 7) says the qualitative

researcher must apply intellectual effort to develop a ‘thick description’ of what she is doing. I trust I have achieved that.

This study may not have resulted in a conclusion, but I hope it will shed light on and add to the conversation regarding what a child knows and what they choose to apply.

CHAPTER 8: Anxiety - an inner world pandemic

Anxiety was the most prevalent reported emotion experienced by the boys with regards to learning to spell. Over the course of all 8 interviews, there were 95 references to anxiety around spelling and the application thereof.

Anxiety is a strong emotion. The ULM, as do Piaget and Vygotsky, argues that all emotions are linked to the episodic memory – the memory of experiences in life. Although the details of the event may fade, the emotion lingers, and can affect behaviour (Shell *et al,* 2010). Negative emotions, such as anxiety and fear, take up working memory capacity and can leave very little space for the child to access their knowledge on the subject, or to deal with the task they need to complete. This can have a profound effect on how the neural pathways needed to learn the spelling words are laid down and connected to ensure learning has taken place. Anxiety is not a pleasant emotion to experience, so a child will not be willing to engage with a task that makes them feel bad.

The data revealed 5 main sources of this anxiety around spelling. The main source of the most-frequently mentioned anxiety was the change in the spelling programme. Secondly, the discussion became very animated, and emotions were high, when the boys expressed their anxiety around the test format and the way in which the test was conducted. A third source of anxiety was the way in which the boys seemed to understand that they did not have enough time in the week to learn the spelling effectively, so that the words were properly conserved. The data revealed that the fourth source of anxiety was the actual of writing the weekly spelling test. Finally, the boys seemed to feel pressure for their parents and teachers to be able to spell correctly, although the boys knew they could not live up to those expectations.

The first source of anxiety: Changes in the spelling programme

To understand where the anxiety around the changes in the spelling programmes originates, it is necessary to understand how these respective programmes are taught and learned. I will first describe the Grade 3 and Grade 4 spelling programmes respectively. I will then give a brief analysis of the differences between the two spelling programmes. Finally, I will describe the responses of the participants to the changes of the programme between Grade 3 and Grade 4.

A description of the Grade 3 spelling programme

In Grade 3, the school uses an amended *Jolly Phonics* spelling and grammar programme. This spelling programme is used in Grades 0 to 2 in the Pre-Prep and is also amended in these grades to best suit the boys. The Jolly Phonics programme is carried on into Grade 3, the final year of Foundation Phase.

The *Jolly Phonics* programme takes a concrete approach to teaching spelling in that the activities engage the senses *and* the body. There are letter symbols and picture prompts for the eyes; letter sounds and songs for the ears; and physical actions for the body to perform. The picture prompt is included in the weekly spelling list to help reinforce the action and sound of the week.

Following on from Grade 2, the focus in Grade 3 continues to be on the individual sounds, the combination of these sounds, building words and combining these words. In Grade 3, grammar is intentionally practised more often each week. The words and tasks to be completed are linked to the grammar skills being taught, which include the more difficult concepts such as understanding the role the word takes in a sentence (i.e., parts of speech). In Grade 3, the main parts of speech covered are common and proper nouns, adjectives, verbs, adverbs, words with more than one meaning (homonyms) and words that sound the same but have different spelling and meanings (homophones). For example, when doing the long 'o' sound, the word 'bowl' could mean 'I bowl a ball' (used as a verb) or 'The fruit is in a bowl' (used as a common noun). The terms 'homophone' and 'homonym' are not formally introduced in Grade 3 – simply the concept of 'many different meanings' and 'different spellings changes the meaning of the word'. The spelling tasks that are given in order to practise the spelling words consist of differing combinations of skills practise. Some examples are: finding the word that fits a description; a small crossword puzzle; a word search puzzle; and fill-in-the-missing-word in a few sentences. At the end of the spelling tasks, the boys parse three sentences - breaking them down into their component parts - and thus link the spelling words to the part they play in a sentence. This serves as an introduction to grammar. The weekly spelling words are used in the grammar tasks of that week to provide more practise with the weekly words.

The original JP programme lists 20 words to be learned each week, all containing the same sound. Being UK-based, the lists often contained words that South African boys would not know or use. For example, our boys would not know, nor use, the word 'hedgerow' (for the long 'o' sound - /ow/). So, this word is not included in that week's spelling list. Nevertheless,

a word such as ‘chamber’ (the long ‘a’ sound), while not used often, is included because the boys have a better chance of coming across it in their reading. The weekly words are linked to the grammar tasks set out by the JP programme. This means that in some units, the words that have been removed from the lists may still appear in these grammar tasks. These words are then discussed and investigated at the time, but are not included in the words to be learned or tested.

In my role as the Academic Support teacher for Grades 3 and 4, I felt that the combination of unfamiliar words and the number of words to be learned each week was not helping the boys to learn spelling effectively. In consultation with the Grade 3 teachers, I decided to leave out the words our boys would not use, effectively reducing the number of words the boys needed to learn each week. The amended weekly lists now consist of between twelve and fifteen words, each word containing the same sound, along with four sight words (words with irregular spelling). The grammar activities and the spelling practise activities continue to be used, although we do still amend the lists further if we find the boys are struggling to use and relate to the words.

Figure 11 below illustrates an example of what the Grade 3 amended weekly spelling word lists look like.

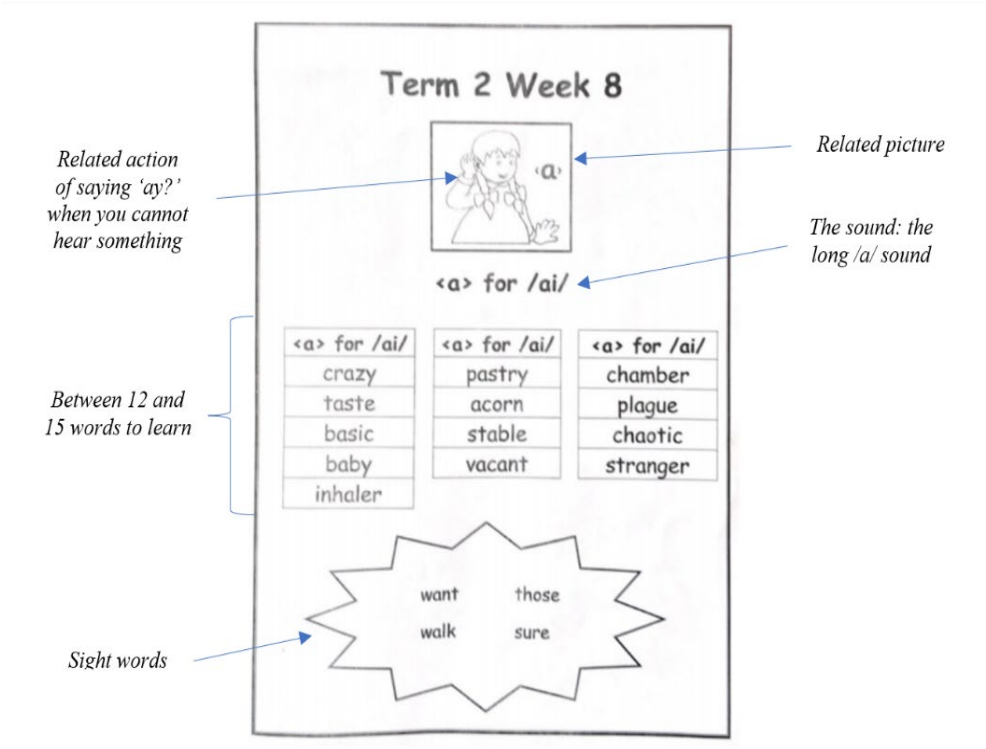


Figure 13 - An example of a list of Grade 3 spelling words in the amended Jolly Phonics Spelling

During a telephonic conversation with the Grade 3 teacher who coordinates the curriculum for this grade, she explained to me where and how spelling fits into the school day:

In Grade 3, there are three forty-five-minute lessons per week dedicated to the spelling words of that week. The first lesson includes an introduction to the sound of the week, and a short text that is read to the boys. This text contains many words with the week's sound. The boys need to listen for the sound and the words, then write the words they hear with that sound on a white board. For example, the long 'o' sound ('oa', o_e, ow). The text may include sentences such as: 'The g**oa**t foll**ow**ed the rainb**ow** and went h**ome**' (my example). After the reading, the teacher then explores these words further by grouping words with the same long 'o' sound together on the board – 'goat' under 'oa'; 'home' under 'o_e'; 'rainbow' and 'followed' under 'ow'. This activity serves as an introduction to the spelling word list of the week. The lesson goes on to break the words into syllables, explain the meanings (or multiple meanings) of the words and for the boys to create their own sentences with those words.

During the second forty-five-minute lesson of the week, the boys complete a worksheet with various activities (some of which are mentioned above) with which they can practise their spelling words. This worksheet is part of the JP spelling programme. The third lesson of the week involves the boys working on a worksheet designed by the Grade 3 teachers. In some lessons, the class play spelling games such as Finding the Hidden Words in a spelling word. For example, when learning words ending with 'le', the word 'THIMBLE' will be used to find hidden words (him, bet, Tim, bite). Dictionary work is included in other English lessons during the week, where the boys must look up the meanings of words in a dictionary or put their weekly words into alphabetical order. Another game involves the boys working in groups, each with their own white board. The group is given a word to spell. The boys in the group need to write one letter on each board, then go to the front of the class and arrange themselves, holding their white boards up, so that the word is spelled correctly.

As part of their homework practice, the boys are required to write their own sentences, each containing at least two of the spelling words. The boys are encouraged to write sentences of a minimum of eight or nine words in length (one word for each year of their age).

The games and practice activities are still relatively concrete in nature, the boys having to physically manipulate the sound / letter combinations. The boys learn to break down the words into spellable syllables (known as decoding) and then to build the word up by listening for,

then writing down, the sounds. The boys are being introduced to grammar through the parsing activities, the focus being on verbs, adverbs, common nouns, and adjectives only.

A description of the Grade 4 spelling programme

In Grade 4, the spelling programme changes to *Adventures in Spelling* (AIS). This is a South African based programme, set out in a textbook the boys are required to complete by the end of the year. The programme comprises weekly units, of which the boys need to complete a unit per week, between Monday to Thursday. Each unit takes a double page in the textbook and is made up of fifteen words to learn, five sight words or commonly used words, and various activities that practise the spelling of the week. Some units focus on spelling rules such as 'y' turns to 'ie' when 's' is added (try becomes tries). Some units focus on a vowel blend such as 'ea' for the long 'e' sound (read). Yet other units focus on words that have silent letters (listen, crumb), or end in 'le' / 'el' (little; able / camel; caramel). Towards the end of the book, some units focus on prefixes and suffixes. The words to be learned each week all relate to their respective focuses.

The activities in each unit comprise differing combinations of the following: completing various kinds of sentences (fill in the missing word, create a sentence using two of the spelling words, write your own definition of the word); spelling tips (such as syllabification, reminders of previous words and prefixes / suffixes); writing the words in alphabetical order; crosswords; spelling of numbers (this is revision and not usually connected to the words of the week); and lastly, an activity using the five sight / commonly used words. To extend the boys' vocabulary, and which is something that is not a part of the spelling unit, the teacher encourages the boys to find five of their own words that relate to the focus of the week.

Figure 14 below is an example of a week's spelling activities.

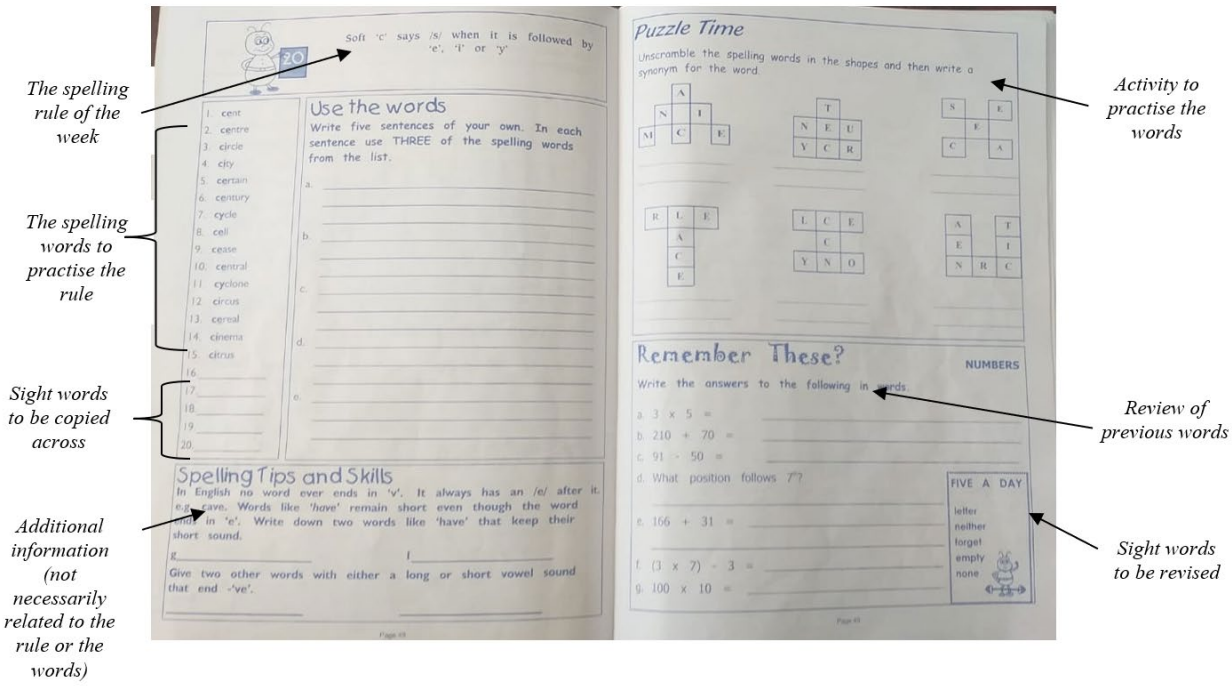


Figure 14 - An example of a list of Grade 4 spelling unit in the 'Adventures in Spelling'

The Grade 4 teacher who coordinates the curriculum for this grade explained to me in a telephonic conversation, how and where spelling fits into the boys' day:

In Grade 4, there is one forty-minute lesson per week dedicated to spelling. The words and activities for the week are previewed and the words are discussed in detail. The teacher goes over the words' meanings, or multiple meanings, and any confusion around meaning is cleared up. During language and comprehension lessons further into the week, the spelling words are included in the discussion, but the discussion is not limited to the present week's words. Words from previous weeks may be included if applicable. The teacher includes grammar terms such as verbs, adjectives, antonyms, synonyms, homonyms and homophones into the English lessons as and when the opportunities arise. This reference to grammar terms is not part of the AIS programme - rather is intended to make connections with words from previous spelling units, and connections with the task at hand.

The boys are expected to learn their spelling words each day for homework. They can choose which words and how many they learn each day, as long as all the words are learned by Thursday, when the spelling tasks are marked together in class. The boys complete the activities either for homework or in class between Monday and Thursday. The teacher checks

that all corrections are correct, and the books are taken home by the boys so that they can continue to revise the words for the test on Friday.

A brief analysis of the two spelling programmes

The *Jolly Phonics* programme is a simpler programme to follow and use in that it uses the senses to teach the letters, their sounds and symbols, and combinations of sounds and symbols. It does, however, contain words the boys would not necessarily use or know. With the *Adventures in Spelling* programme, although the spelling words are South African based, the concepts around spelling and language are more challenging for the boys in this study to learn and apply. The tasks to be completed in each unit often do not give opportunities to meaningfully practice the words. Some tasks feel very disconnected to the words. Some even add their own pressure. For example, children with reading difficulties struggle with activities such as the unscrambling of letters to find a word. The more the boys struggle, the more their anxiety grows. It seemed that the boys I interviewed no longer felt comfortable with the way the spelling programme was presented. For example, it seemed they knew they did not know or remember terms such as 'antonym', 'homonym' or any of the names of the other parts of speech, and this awareness of their lack of knowledge led to deeper feelings of frustration and anxiety.

In a telephonic conversation with a Grade 4 teacher, she said the Grade 4 teachers are fully aware of the differences between the two programmes and anticipate difficulties at the start of the year. The boys receive a lot of support and guidance in this change-over period in the form of extra time to complete activities and tests, and assistance from the intern teachers and teachers in the form of extra help in class. She believed, however, that most of the boys get used to the new AIS programme quite quickly. It appears this is an assumption most teachers have been making, myself included.

It needs to be noted at this point that the interviews for the study were conducted in June and July – six to seven months after the start of the school year. By this time, the boys should have become accustomed to the AIS programme and test formats if the teachers' assumptions are correct. It did not seem to be the case. The young boys in this study were still very anxious about both the spelling programme and the spelling tests.

There is, however, one aspect that both spelling programmes share, which is that the spelling words are taught and learned in isolation. By this, I mean that the words are taught according to a set, predetermined programme and are not dictated by, nor related to, the language and subject matter teaching curriculum. For example, in Grade 3, the long 'o' sound will include words containing that sound in its various combinations (goat, moat, bow, remote *et cetera*), but these words do not appear in the vocabulary of any other subject being taught at that time. As a result, the boys only learn those words during their spelling lessons and for the Friday test – there seems to be little opportunity to practise the words in different contexts. The same applies to the Grade 4 spelling programme. The rule of the week and the associated spelling words are only practised within the confines of the AIS tasks, regardless of the vocabulary and topics being covered in class. Both the Grade 3 teachers and the Grade 4 teachers are aware of this and told me, in conversation, that they do try to point out the words and rules as they appear in other situations in class My understanding of this situation is that pointing out the words as they appear in classwork is incidental and not explicit. There does not seem to be enough practice to effectively conserve the words in memory (this will be examined in more detail in the Analysis chapter).

In Grade 3, the boys play games with their spelling, and do tasks where the words are physically broken into their syllables, or the boys need to move their bodies to form a word (described above). In a test situation, the thought process is simpler – hear the word, remember the word, write the word. In Grade 4, the activities associated with spelling practice do not seem to be meaningful opportunities to practise spelling for these boys. The test situation requires the boys to have prior knowledge of vocabulary, an understanding of concepts such as homonyms and homophones – the thinking process is no longer a simple one. The boys in this study have sensed this shift but cannot name it – they can only report that the spelling is much harder in Grade 4.

The evidence in this study suggests that the main source of anxiety for the boys is this subtle shift in emphases between the two spelling programmes - *Jolly Phonics* and *Adventures in Spelling*. This shift is a move away from a concrete sound-grapheme (sound-symbol) approach to teaching and learning spelling in Grade 3, to a more conceptual application of spelling rules, definitions, and knowledge of the deeper constructs of the English language in Grade 4. It appears that the focus of the spelling programme in Grade 4 is no longer on teaching spelling as such, but on teaching grammar. These are two very different subjects.

I am very aware that there cannot be a one-size-fits-all spelling programme. There will always be pros and cons for every programme, and each programme will suit some children but not others. But it seems to be the subtleties within those programmes that are overlooked, whichever way the programmes are amended to suit the students.

The boys' responses to the change in spelling programmes

The anxiety experienced by the boys in this study apparently stems from the subtle shift in emphasis between the two spelling programmes. Where JP is a more concrete approach to teaching spelling, AIS seems to focus more on language learning and less on the actual teaching of spelling *per se*. The boys became very animated when discussing this change in spelling programme. Beckham expressed the general feeling of the participants around the spelling programme in Grade 4 when he observed that '... in Grade 3 I usually found it [spelling] easy. Yeah, like the questions were very easy' but, in Grade 4, 'Spelling now… it has changed. It's not as easy as it used to be'. He now finds that learning and writing his spelling is harder – 'the stuff that used to just come to me and I could do it properly, and now it takes a little bit longer'. The effort to learn has become greater. Oliver also felt the pressure of the change as 'I kind of find the words difficult, like, you have to know and understand things'. It was no longer just a case of learning and remembering the spelling words as it had been in Grade 3 - but the spelling programme in Grade 4 expected the boys to know meanings, definitions, antonyms and synonyms.

When asked how this new programme taught spelling, Moo observed that 'It doesn't really'. The boys in Moo's group could not see the relevance of the weekly spelling rule: when asked if the weekly words were linked to the rule, all four boys said no. Oliver could not see the need to be given definitions to learn, when the definitions were not asked in the test – 'So, sometimes it doesn't help, cos sometimes in a test there's no definition, so it doesn't really help'. While definitions of words will define how to spell the correct version of the word (e.g., red versus read), Oliver found it difficult to remember which definitions fitted with the spelling word for that week. Moo added to this sentiment of lack of relevance by saying 'And then it says, like, suffix these words, and it doesn't even link to what we're doing. It only links to our assessment'. Their practice did not seem to be purposeful to these boys, as they struggled to find a meaningful link between the spelling words, applying the rules and how they chose to use these words in their own writing.

Johny felt the pressure of having to deal with more difficult words. For him, the biggest change has been that 'these days they give us hard words'. Johny is an English second language user and finds he needs to put a great deal of effort into learning his spelling in Grade 4. 'When you have too much homework to do, … you just forget them [the weekly spelling words] completely by Friday [spelling test day]'. Johny finds it hard to learn and reproduce his spelling in a test, so he does not prioritise it. Spiderman, also an English second language user, observed that 'something that has changed English for me is that… shoooooo… you have to write very long words and very long sentences'. The boys in this group agreed with Spiderman. The conversation got very animated when asked if spelling had changed from Grade 3 to Grade 4. All the boys answered at once, their collective body language emphasising their frustration and indignation that the words were now '… a lot, like, harder' (Jack). Although Tony agreed wholeheartedly with his peers, he nevertheless felt obliged to point out that 'so basically, … [spelling is] a bit harder because now we [are]… a grade up'. This understanding, however, did not make the spelling any easier – it simply added to the anxiety around spelling. What Tony was pointing out was he felt the pressure of what he *should* know and be able to do but senses he does not. This awareness of his own perceived shortcomings generates even more anxiety around spelling.

Mist echoed these sentiments about the difficulty of spelling in Grade 4 changing and getting harder. He observed that at the '…beginning of Grade 3 I struggled [with spelling], but in Grade 2 I was fine'. He went on to clarify, 'Ja, in Grade 2 it was a tiny bit, like, hard, but I could still manage'. When asked about the possible changes from Grade 3 to Grade 4, he said 'Yes, it's changed a lot, I think'. For him, the biggest changes were conceptual – having to link his knowledge to the information in front of him. 'Like, picture identification – that's quite difficult. Cos, they give you words… that explain …what the word is, and you have to try and get [identify the word on the list and remember how to spell] the word'. Not only did he now have to learn new words, but he had to link them to a spelling rule, to the meaning, to antonyms and synonyms. The way in which he has to learn how to spell words and the way in which he has to demonstrate his learning (the test format) is now more complicated in Grade 4, and not nearly as simple as the way in which words in Grade 3 were learned.

The second source of anxiety: Changes in the test format

The source of the anxiety around the changes in the test format seemed to stem primarily from the unpredictability of what form the test would take each week. Knowing what form a test will take, and what is expected of you, affords you a sense of comfort – it is one less thing to worry about. What emerged from the data was that the boys no longer seemed to have this small comfort – they did not know what to expect from the test each week.

A description of the Grade 3 spelling test format and procedures

In Grade 3, the Friday test takes the form of ten individual words to write (call-out) followed by three or four dictated sentences containing the words of the week, and some words from previous weeks. The teacher goes slowly and at the boys' pace. The individual words being tested are read out once, then used in a sentence to give a context to their meanings, and then word is repeated once more. The dictation sentences are read twice in their entirety before the boys are allowed to write. At the start of the third reading of the sentences, the boys are allowed to start writing it down. The sentence is broken up into groups of three- or four-word chunks. These chunks are repeated twice each, so that the boys are able to hear and remember what words they should be writing. Finally, once the whole sentence is completed in this way, it is re-read in its entirety so the boys can make sure they have written each word. The boys are encouraged to touch each word as it is read out to check that they have not left any word out. It is the same every week. It is simple and predictable.

A description of the Grade 4 spelling test format and procedures

In Grade 4, that pattern and predictability changes. In the same telephonic conversation, the Grade 4 teacher (see 8.1) explained that the weekly spelling test now includes different combinations of picture identification and call-out words (individual words with no associated picture). In addition, a clue or definition may be given, and the correct word must be spelt. Sometimes there is a whole section comprising only of clues and definitions. Other test activities may include providing an antonym or synonym for a word; between one and four dictation sentences where marks are also given for punctuation (mainly capital letters and full stops); a section where the boys are required to choose the correctly spelled word from a choice of two.

Picture identification forms the main body of the spelling test and comprises six to eight pictures. For example, the picture of a Wi-Fi signal may be given, and the boys need to remember that the word ‘signal’ was one of the weekly words and must then spell it. The pictures are not always obvious. For example, the picture may be of a man, but the word ‘gentleman’ was one of the weekly words, and so ‘gentleman’ must be selected and correctly spelled. Should ‘man’ be written down, it will be incorrect.

The way in which dictated sentences are read out takes the same format as in Grade 3. The dictated sentences are read twice in their entirety before the boys begin to write. When the boys begin to write the sentences down, the sentence is broken down into smaller chunks of three or four words, each chunk is repeated twice. Finally, the whole sentence is read in total once more for the boys to check they have written each word. For the call-out words, the word is called out, then used in a sentence to give the context of the meaning, then repeated once more.

The teacher went on to say that the Grade 4 spelling test lasts between 20-25 minutes. The pictures for the picture identification are displayed electronically on the white board. All clues, definitions and sentences are read out by the teacher. The test goes at the teacher’s pace, and she watches the class to monitor how the class is progressing. She will go back to previous questions if the need arises. The tests change each week as different combinations of question activities are used, so the boys do not know what kinds of questions will be asked.

The general consensus amongst the boys was that it is easier to learn for a test in Grade 3 because the boys knew what to learn and how it would be tested – predictability is especially important for 8- and 9-year olds. At the start of the Grade 4 year, this predictability is equally important. Although the Grade 4 teachers are aware of difficulties the boys may face with the change in test formats, I believe we have all underestimated the depth of anxiety it causes. The participants in this study are already vulnerable spellers, and to have this enormous change happen at the start of the year, while wanting to do well for their new teacher, must affect their confidence in their abilities to spell and apply their spelling. This is reflected in their comments in section 8.1. It was the boys’ responses to the questions about the possible changes in their spelling programme and the way in which their spelling words were tested, that first made me aware of the underlying anxiety surrounding these changes.

The boys' responses to changes in the test format

The change in the spelling programme brought with it changes to the spelling test format. There was a lot of anxiety expressed around these changes. When asked if there was a difference between the spelling tests in Grade 3 and Grade 4, Jack said, 'Yes! They are a lot, like, harder!'. Thomas agreed, 'I felt they were a lot easier than the spelling tests from this year'. Many of the other boys also experienced anxiety about the change in the test format in Grade 4. Not only are the spelling tests assessing their learned spelling, but they are also assessing prior knowledge, vocabulary, and a deeper understanding of the concepts of English and English grammar. The boys who do not speak English as a first language at home (5) found this new emphasis on prior knowledge particularly difficult. All the boys interviewed felt that the pressure to make the conceptual links between the words learned and how they were tested was hard – both English first language users and English second language users. 'It's not as easy as it used to be' (Beckham). The source of their anxiety seems to be the unpredictability of what will be asked in the test. This was not something I had considered. '… so, they [the teachers] would swap them [the test activities] around. Picture ID…' (Spiderman) and 'definitions… call-out…' (Moo). Panther got very agitated when talking about the tests. He said he gets '…frustrated easily and I'll say, I don't know what to do here, I don't want to do this'. Panther, who is an English second language user, went on to say he found the picture identification part of the spelling test the most difficult. He observed, '…it's picture identification [that is hardest], because sometimes I'm, like, "what's this word again?" and…I write the wrong answer. And I get angry and frustrated'. Picture identification assesses vocabulary and an understanding of concepts such as synonyms and antonyms before the boy can even start thinking about how the word is spelled.

The anxiety generated around the changes in the spelling programme and the test format was not something I had anticipated, yet this anxiety was palpable. It was visible in the boys' body language – they sat on the edge of their seats and there was a great deal of hand gesturing and leaning forward. It was also visible in the way they spoke – their voices were raised; they spoke fast; and every boy interviewed wanted to be heard. The boys showed a range of emotions, such as frustration, indignation and sadness, but anxiety was the most prominent.

Although the changes to both the spelling programme and the test format have caused major anxiety in the boys, I am not going to analyse either one in detail, nor am I going to do an in-depth comparison between both the programmes and the test formats. My focus in this study is to better understand the role motivation plays in the boys' abilities to learn and apply spelling,

and what motivates the boys to choose the kinds of words they do to use in their classroom writing tasks. I want to look at the boys' thoughts and feelings around spelling in the context of their school environment – and this includes the spelling programmes used by the school. The brief description above of the *Jolly Phonics Spelling and Grammar* programme and the *Adventures in Spelling* programme, together with the descriptions of the two different test formats, are there to help set the scene of where the boys in this study find themselves, and, surprisingly, the fact that these changes have caused so much anxiety.

The third source of anxiety: Lack of time to learn and practise spelling words

The third source of anxiety for the boys in this study appears to be the lack of time they feel they have available to learn and produce their spelling effectively. The first source of time anxiety was the lack of time in the week to learn the spelling words. Secondly, the boys experienced anxiety regarding getting the knowledge *in* – i.e., conserving the words The third source of anxiety regarding lack of time was linked to the lack of time in the tests to get their thinking *out*.

Lack of time due to work overload

The feeling of being overwhelmed with homework and tasks was something I had anticipated. The boys in this study have very busy lives. Many of the boys have a full day at school, and then have afternoon activities at school as well as outside of school – either for sport, for music or religious studies. What was new, however, was the strength of the anxiety and frustration surrounding work overload. The boys appeared particularly anxious about the lack of time to learn their words in the week and the lack of time in spelling tests to think or complete the test. Again, the body language was expressive. When the boys spoke about the changes in the spelling programmes and the test formats, they were animated. When talking about work overload, most of them sat back in their chairs, and it looked as if someone had taken the wind out of their sails. FN, however, become very outspoken on this topic. He felt the pressure of lack of time keenly. His responses are recorded in the following sections. Beckham simply stated, 'There's a lot of homework actually'. Because the value of spelling is less than the value given to other subjects (mentioned in 8.1.3), less available time will be allocated to learning spelling and more available time allocated to the other, more value-laden subjects.

Lack of time to learn and conserve spelling words effectively

The boys spoke a great deal about the lack of time in their week to complete homework and tasks. This is closely linked to the anxiety expressed around the changes in the spelling programme and the spelling test format. The less time available to learn their spelling, the more anxious they get for the Friday spelling tests – anxiety over not having enough time to learn is added to the anxiety of the new programme and test formats. Mist, Spiderman and Johny agreed that the volume of work – and not only in spelling – increased in Grade 4, along with higher expectations from teachers and parents. To find the time to practise spelling for the Friday test is sometimes difficult to do. Steve finds he can '…only leave it for the Friday morning'. Steve is involved with gymnastics and needs to practice every day – which adds to the pressure of time to fit schoolwork into his week. He says 'They [his parents] test me [on the way to school on a Friday] and then I have the words running through my brain'. I think of this kind of practice as 'just in time' learning – Steve learns his words *just in time* for the spelling test, but the words are then easily forgotten. He feels 'if I [get] tested and we leave it to not the Friday morning – so we test me on Thursday – I might forget about the words'. For Steve, there is little time to practise for his tests effectively so that he might retain and remember the words. Like Steve, Beckham has extramural activities that take up a great deal of his time. Beckham needs to attend religious classes every afternoon, Mondays to Thursdays. So, his time to complete homework and learn for tests is significantly limited. 'I don't give my time [to learning spelling] because tonight … I've got religious classes and I finish late'.

Lloyd is another young boy with very little time to spare in the week. 'We get home, we start the homework. But, like, I've got so much homework. I've got practising spelling, piano, Smart Tech, homework. And then we have to go and bath, eat dinner, read and go to bed'.

I felt a profound sadness that these young boys (only 9 or 10 years old) were feeling this amount of pressure to perform. I think Beckham sums it up when he stated 'this past term I haven't watched any TV. I haven't played PlayStation. I haven't played iPad. I haven't watched TV. There's a lot of homework actually'. Beckham looked so sad as he said this. His body slumped into his chair, and his head dropped to his chest. Johny, too, felt the pressure of lots of homework: 'you have too much homework to do, so you just forget them [spelling words] completely on Friday. Tony added 'It's just hard. It's too much'. Jack found '…you have to stress for the assessment and stress for your homework and stress for your English homework. And you also have to stress for your Math'.

Picking up on Jack's stress over assessments, a concern was raised by many of the boys around the start of formal assessments and the lack of time to learn their spelling effectively. In our school, from Grade 1 to 3, all tests take the form of small class tests as a section of work is completed. Marks are allocated to these tests, but only the teachers keep a running score for each subject to inform their own teaching practice. The time set for the tests is flexible, affording all boys the chance to finish the test.

From Grade 4, the boys are able to begin working towards their Academic Colours and Honours awards, which are awarded in Grades 6 and 7. Grade 4, then, is the year when the boys begin formal assessments. Blocks of work in the core subjects of English, Maths, Afrikaans / isiZulu, History, Geography and Science are assessed using summative tests. Marks become all-important and the focus of every test. The pressure from parents to get high marks is now added to the increased volume of work and higher expectations from the school. Panther observed that 'some parents make you feel worried about your test, if they say, what do you think you're gonna get?'. Panther interprets this question as pressure to do well so as not to disappoint his parents. The anxiety generated around these assessments is huge.

The academic assessments are written on Wednesday mornings followed by the spelling test on Friday mornings. 'Now that there's been assessments, I haven't really been studying for them [spelling tests] cos I've been studying for the assessments and then the day… only the day before… I'll remember I have a spelling test' (Jack). Jack goes on to say that 'I don't really study [for the spelling test] until, like, Wednesday' – once the assessment is out of the way. Tony also admits to only studying for his spelling tests 'The day before…'. He goes on to explain 'I always do all my homework. Now that it's the upcoming assessment for History, I only worry about my [spelling] tests on the day before [the test]. Then I really study because all the work that I needed to do was handed in, so I only have time that I'd use for my spelling test because I got no other work to do – just to learn [my spelling] and read my book'. So only once *everything* else is done, does Tony look at his spelling. Again, the 'just in time' learning becomes the *modus operandi* of learning spelling. While interviewing the boys, I had the mental image of little ducks learning to swim, but only just managing to keep their heads above the water. No wonder spelling is not fun to learn when it seems to be one more thing to have to do, and one more thing to have to succeed at.

FN felt 'they [the teachers] shouldn't give us homework in the week with our assessments'. He got really animated about this issue of work overload – he sat forward in his chair, his hands

were waving all over the place and he expressed so much frustration that he found it difficult to get his words out. His issue with homework and learning for assessments and spelling tests was 'I don't get why they give us homework when we have [an assessment]. … so we can get more time to practise for our assessment. Not doing our other homework that's not so useful in our assessment. It's like our Maths homework – it's not going to be useful in our assessment - like an English assessment. It's not going to be useful!'. FN almost jumped out of his seat as he finished. The rest of his group literally shouted their agreement. Panther, too, feels the pressure of having too much homework. He admitted to forgetting about learning for either the assessment or the spelling test and says '[I feel] frustrated, anxious and you feel like you don't want to go to school tomorrow'.

Spelling, however, is a very small portion of the total mark for English. As a result, the boys seemed to focus more on learning for an assessment than they do on learning their spelling. Will has already worked it out: 'cos these [spelling] marks don't make a big difference at the end of the year for our marks. …our assessments do that'. I got the feeling from Will that he had already given up on improving his spelling skills. He was very reliant on his teacher or other adults to correct his spelling in written tasks, and only occasionally would turn to the dictionary or thesaurus for help. Even when marks are given to a piece of writing, Will felt he could '… always go to her [the teacher] for the spelling'. When writing a paragraph where spelling does not count, Will felt '… I can, just, like, write free. Like, whatever I want. And what I think…[using words he wants to use without worrying about correct spelling] …and then she will just correct it for me'. Moo felt he did not have any skills that would define a good speller and when learning his spelling, very little effort goes into it: 'I practise, but I don't concentrate'.

The lack of time to learn spelling, whether it is because of a very busy schedule, too much homework or because there is an assessment that week, results in poor conservation of the spelling words. Moo told me 'So, I forget the words as soon as it's break'. The spelling test for his class is at the end of the day, two hours after the end of break. Moo remembers his words (learned just in time) until break, then they are gone from his memory. He cannot keep them in his mind any longer. Moo is aware of this, and it seems to add to his anxiety over writing the test.

Many of the other boys admitted to not remembering the words from one week to the next, and from term to term, but I think Tony hit the nail on the head when he stated that not having

enough time to learn and practise purposefully does not help him conserve the words: '[it should] not [be] "now we're done with this week's spelling test. Gone forever". We don't use these words ever again. These words are gone from our memory!'. He understands he does not have time to get the words into his memory, and he understands that, as a result, he does not do a good enough job in conserving the words. He is aware that this situation, for him, is not right.

When asked how they could improve the way in which spelling is taught, Thomas suggested having more time to learn the words. Thomas has been diagnosed with dyslexia (a processing speed difficulty – DSM 4) and finds that the pace of work, in general, is fast. 'I would make it [the time to learn the new list of words], like, two weeks before, cos then they [boys who struggle with spelling] stress for the first week, and then they, like, ok, I know these words – it's gonna be fine'. Thomas clearly acknowledges the anxiety around having to learn new words, but he feels that, with more time to learn the words, his anxiety would be alleviated.

A result of the lack of time in spelling tests

Part of feeling overwhelmed with schoolwork, is the knowledge that they are not prepared enough for their spelling tests. When knowledge is not effectively conserved in long term memory, it takes a little longer to locate (remember the word) and then to apply this knowledge. In Grade 3, the boys had enough time to complete the test – there was no real time limit as the teacher called out the words and the sentences at the pace of the class. If, however, a boy needed a little more time to write the words down, extra time was given to him. '… actually, she [the teacher] gave us enough time. She gave us a lot of time' (Beckham).

In Grade 4, however, there is a time limit on a few of the sections of the spelling test. For example, the pictures for the picture identification are projected onto the whiteboard. Each picture is displayed for a certain amount of time. If the boy has not registered what the picture is, and what he needs to do with that information (spell a synonym / antonym / homonym / homophone), he will not be able to come back to it and try again.

The discussion around time given in spelling tests brought on a new wave of loud voices and anxious faces. Spiderman got quite emotional at this stage. He is Xhosa-speaking at home, and his parents are often not able to give him the support he needs. He felt the teacher went too fast in the tests. He implored: 'why can't you [the teacher] just wait for us to finish? Then you can

carry on. Cos she just gives us only one minute. She's like, one minute's okay. On to the next one. But we are still writing the [last] sentence'. He feels he is not heard or supported by his mother when he tells her of this problem: 'And I keep on getting shouted at by my mom. And I'm saying to my mom… no, because she [the teacher] was reading… she was, like, going fast. She [his mother] says I must catch up'. Spiderman almost whispered the last sentence. He looked so dejected.

Moo echoed Spiderman's feelings and added he felt annoyed 'because you can't finish your sentence and then you will lose lots of marks'. Beckham, who has poor eyesight and a diagnosed processing speed difficulty, got very agitated when talking about the time in spelling tests. His spoke faster and faster, trying to get his thoughts out. His experience of spelling tests in Grade 4 is very different to his experience the previous year. In Grade 3, '[my teacher] used to give me a lot of time to do it [the test]'. However, in Grade 4, 'time is the one [thing that] there is not a lot of'. He felt his teacher rushed through the tests - 'she was rushing through all the words, and it was wait, wait, wait, wait, wait!' Beckham, at this point, was bouncing up and down on his seat. In defence of the teacher, Moo pointed out that the teacher is allowed repeat the word twice. However, she does not repeat it a third time, which is something Spiderman wishes would happen, as he needs time to think.

In separate interviews, Panther, Johny, Spiderman and Shaq (all of whom are second language users) expressed sadness that the teacher does not slow down. 'It makes me feel like she doesn't want to teach or, eish, she's just in a bad mood' (Spiderman). Panther needs time to think about remembering or accessing the word for the picture identification question, and then the word to use if the question asks for a synonym or antonym. He told me '… I get angry… and frustrated' because he feels he needs more time to access his knowledge. For these boys, connecting the words and the conceptual language links is effortful. In addition to this, being English second language users, they may not have the same vocabulary as their peers.

Oliver felt the effects of anxiety when he said 'So, in a test, you've got a few more seconds. But you've spelt the word before, and you know it. But when I'm under pressure I forget how to spell the word'.

Between not having enough time to prepare and not being given enough time in the test to access what knowledge they do have, the boys seemed to experience varying levels of anxiety. It was a surprise to find the boys were aware of, and anxious about, not having enough time to learn their weekly words (getting knowledge in) which they knew would lead to anxiety over

not being prepared enough for the spelling test (getting knowledge out). This showed that the boys had a keen awareness of what they needed in order to succeed, but that they were not getting the opportunities to do so (metacognition).

Less time allocated to practise to get the new words into their memories, results in lower marks in the spelling test. As the other subjects demand most of the time and effort in the week, and as they carry more marks for the academic year, the boys do not seem to prioritise spelling practice. Many of the participants only started practising their spelling the night before the test. As a result, spelling does not hold the same amount of value to the boys as does Maths or reading or Integrated Technology.

The fourth source of anxiety: Writing the weekly spelling test

Following on, and closely linked to the lack of time to learn and remember their spelling words, I wanted to know more about how the boys felt while writing the tests. This was important to me, as I understood that anxiety in test situations has a detrimental effect on working memory's ability to retrieve information such as the correct spelling of a word. Emotions such as nervousness, anxiety, stress, fear, and pressure to perform came to the fore.

Nervousness and anxiety around the test seems to stem from the actual writing of a test, the thoughts and anticipation around marks, and how their parents and teachers would respond to a low mark.

Lack of prior knowledge of the spelling words

Beckham revealed that he 'has butterflies' in his stomach for most of the duration of the test. His anxiety stems mainly from the picture identification part of the test. Beckham struggles to understand what he sees and to retrieve that word from memory. He also struggles to understand what he needs to do - 'and sometimes it's hard to guess what it is. This one was hard. It looked like "grass", but it was "sew" – the needle was green'. George also felt the butterflies in his stomach while writing his spelling tests. His worry was that he could not tell if a word was wrong or right. George feels 'like I'm just going to lose this test, and I'm going to get nought'. For George, the source of his anxiety is his confusion around retrieving the word from his memory: 'I'm trying to find my… trying to remember my spelling word'. He said he feels the nervousness in his head – an indication that he is not able to think clearly. Johny echoed George's sentiments. He, too, felt nervous in a test. Lloyd was able to expand on

George's and Johny's feelings a little more. He, too, felt nervous in the test. He said he usually 'feels okay at the beginning' of the test, but when it came to the harder words, he feels the word is 'somewhere in the back of your head, but instead… no… this word can't be it, and you write another word that is wrong. You get so nervous that you, like, is this right? Is this right? Those are the hard words. I thought... I'm gonna die!'. Lloyd collapsed dramatically on his desk.

Panther, too, feels anxious about the picture identification part of the spelling test. First, he finds he cannot identify the picture, and secondly, he then cannot remember how to spell that word. He feels '…sometimes I'm, like "what's this word again?" and I write the wrong answer. And I get angry and frustrated'.

Steve finds the sentences the most stressful part of the spelling test. The boys need to choose one of two words – one is correctly spelled, the other close but incorrect – to complete the sentence. For example: *The boy (waited; wated) for his mother to fetch him.* He panics that he will choose the wrong word and get the sentence wrong. It appears Steve's source of fear and anxiety stems from second-guessing himself as he has not yet consolidated the word in his memory.

On the other hand, neither Oliver nor Moo get anxious about writing the spelling test. Oliver feels he practises hard with his parents, and any word that is wrongly spelled during practise is written three times over again. He admitted to only starting to practise the afternoon before the spelling test (just-in-time learning). A little further into the interview, however, Oliver revealed that he does get nervous in a test, but only when the test is almost over, and he still needs to finish spelling a few words. He said the pressure to complete the test on time makes him forget how to spell the words. Moo finds the 'fill in the missing word' section of the tests difficult. He already has the belief that he is not 'that good at spelling' but his reason is that 'I keep on forgetting the words… other words just come into my head, and I just write them down'. It seems that Moo has difficulty with the higher order thinking and knowledge associated with spelling – that of understanding the sense of the sentence so that he can decide on the correct spelling of the word needed to complete the sentence. He does not, however, worry about writing the spelling tests as he has already worked out that the marks collected from these tests contribute very little to his overall year mark for English. He appeared to not care about the spelling tests very much.

Will had mixed emotions about writing the spelling tests. He said 'sometimes I feel confident, sometimes I totally feel like I don't want to do this because I've barely learnt the words'. He

does, however, feel similarly to both Oliver and Moo in that he is not particularly worried about writing the spelling tests - 'I didn't really worry that much about it [the test]. We do, like, hundreds of them…'. Like Moo, Will has worked out that not all the marks of the spelling tests are taken into account for the year mark.

Spiderman gets so overwhelmed with nerves about writing the spelling test that he 'just prays [he's] gonna get full marks'. Spiderman says the sentence writing (the diction part of the test) is most difficult for him, and he gets so overwhelmed that it makes him '…feel nervous. It makes me feel tired. It makes me feel 'what am I doing?' Jack, too, feels overwhelmed as he sometimes feels he has not prepared well enough, but he does not give up. He said he relies on the stress / fear hormone to help him remember the words – 'and then the adrenaline pushes me to remembering them [the words]'. The fact that Jack feels the presence of adrenaline indicates that he is in a state of fright, flight or fight. Shaq, an English second language user, said that the most difficult part for him in a test, the part that makes him feel most nervous, is having to remember the definitions of words.

Thomas has a different source of anxiety while writing the spelling tests. He has difficulty with getting his thoughts on paper, 'I don't like having to write the word down – I'd rather say it out'. He would prefer to have an oral test rather than a written test. At this point in time, this is not an option for him due to the lack of availability of teachers and venues to afford Thomas this opportunity.

The spelling test and the resulting marks

Nearly all the boys reported feeling anxious about their weekly spelling test marks. Bob, George, Johny, Tony and Mist expressed worry and concern that they would get nought out of ten for the test. When asked if he worried about the mark he might get in the upcoming spelling test, Bob said 'it makes me feel nervous to see if I get a good mark or not'. George said that at the start of the test, he feels 'nervous if I get it wrong or if I get it right. I feel like I'm just going to lose this test, and I'm going to get nought.' Mist reports 'I'm worried that I get zero out of ten or something like that'. But when asked if that was a genuine possibility, Mist answered very emphatically 'Never. I don't think it will ever [happen]'. Mist worries about something he believes deep down will not happen. Thomas (who has a processing speed issue) understands he needs more than the five days given to learn his words. At the start of the week, when the spelling lists are given out, Thomas worries that the words are too difficult for him

to consolidate. He would like two weeks to learn his words, as '[I] would stress for the first week, and then… ok, [I] know these words – it's gonna be fine'.

Tony stresses about his spelling test marks as he wants to do well and wants to impress his mother. The pressure of the test situation sometimes caused him to forget to write all the words down. This results in a poorer mark than he had hoped for. Shaq, too, is worried about getting bad marks in his spelling tests. The source of his anxiety is that he struggles with the grammar side of the test. He sometimes confuses the common and proper nouns, and forgets to spell the proper nouns with a capital letter.

Of all the boys interviewed, Oliver and Moo were the only two who were not too concerned about getting bad marks for their spelling tests. Oliver felt that he practised hard enough (although it was 'just-in-time' learning) to get good marks for each weekly test. He did, however, add later in the interview that he often did not remember the spelling words once the test was done. Moo has worked out that spelling test marks do not count for much in his overall year mark.

The fifth source of anxiety: The pressure from parents and teachers to spell accurately

This section will report the boys' thinking and feelings around the pressure and resulting anxiety they feel from their parents regarding the spelling tests and applying their spelling to creative and classroom writing.

The boys in this study are 8- and 9-years old. According to Piaget, this is the age where children seek to please the significant adults in their lives. Part of pleasing these adults is getting good marks in their academic subjects, such as spelling tests and classroom writing. Vygotsky argues that children of this age place a great deal of importance on the relationships with the significant adults in their lives. These are the adults who teach them (teachers) and help them with homework (parents and tutors). Vygotsky maintains that relationships are important at this age, as are the strategies used to teach and learn spelling within the zone of proximal development. Extra pressure from teachers and parents, perceived or real, will affect how effectively children learn and apply their spelling, and how much or how little the boys enjoy the experience of learning and applying their spelling.

The pressure from parents to succeed with regards to spelling tests

Although all the boys reported receiving help and support from one or both of their parents, not all the boys felt that their parents were placing added pressure on them to learn their spelling. Beckham, however, felt his mother was very strict about him doing his homework properly and neatly – including practising his spelling words. He observes that his mother would 'erase all of Isah's [Beckham's brother] work', and knew that would happen to him if he did not do his work to her standards - 'she even checks my work all the time'. Panther, Spiderman, Shaq, Steve, Mist, George and Jack all felt their parents were strict about learning their spelling and expected good marks from the weekly spelling tests. I am unsure, at this time, whether these boys felt pressure to perform because they did not want to learn something they did not like or have an interest in – for whatever reason, be it that they found learning the spelling words difficult, or that they did not see any value in spelling accurately – or if it was a case of the parents doing their 'parental duty' in making sure homework and spelling was done properly (to be explored further in the Analysis chapter).

Many boys in the study reported working for goals – such as pizza, gifts or other such tangible items – which their parents set for them. This adds more pressure on the boys as they face the possibility of not reaching that goal and then losing that desired item. I understand there is merit in working for rewards, but the goals need to be realistic and genuinely reachable. Most of the boys in this study struggle with learning to spell and applying that spelling, so being given a goal that is out of their reach adds yet more pressure (to be explored further in the Analysis chapter).

There is also a difference between an extrinsic goal (such as those set by parents) and an intrinsic goal (one that is set by the student, for the student). Of the boys in this study, only Steve, Jack and Tony seem to have understood that wanting to learn must come from within, and not only have goals set by the adults in their lives. Steve observed that the effort must come from him: 'sometimes you must do it [work hard] out of the kindness of your heart, or the effort of your heart. Not for reward'. When Tony gets a bad mark for his spelling tests, he said 'it makes me want to push myself into getting a good mark'. Jack saw his efforts slightly differently, although the end results were the same: 'if you feel proud of yourself, you'll try to push yourself'.

Intrinsic and extrinsic goal setting will be discussed in more detail in the Analysis chapter.

Much of the anxiety around the pressure to perform in spelling tests stems from parents' expectations of, and reactions to, the marks their sons achieve in the spelling tests. Of the eighteen boys interviewed, fourteen boys understood that their families valued spelling, and felt the pressure to succeed in their spelling tests. These boys all experienced anxiety around the spelling tests – some more so than others. Of the remaining four, two boys felt no pressure, one boy felt his family did not really care much about spelling, and one boy was undecided as to his family's thoughts about the importance of spelling and so they did not really feel pressure to get good marks.

Of the boys who felt parental pressure and anxiety over the spelling test marks, Panther, GG, George, Shaq and Spiderman expressed their worries most vocally. Their voices rose, they leaned forward to make their points, and their facial expressions of sadness and frustration made me feel very sad for them.

Panther feels the pressure to succeed keenly. He feels his parents make him anxious just by asking him what marks he expects to get for a test. He feels overwhelmed if he must try and guess his mark – so much so, that he feels 'I don't want to do this [have the discussion]'. Panther already knows he struggles with spelling, and this remark indicates he wants to give up before he even starts.

GG's parents set goals of 70% for his spelling tests with the promise of a reward at the end of the year should he achieve them. Although GG appeared to be comfortable with this goal, I got the feeling in the interview that GG's answers were coming from a place of bravado rather than a place of reality, as he admitted later in the interview that he really did struggle with spelling. George has a similar source of anxiety. His parents give him goals of 70% each week if he wants to earn a reward. George is very competitive, and tries hard to reach 70%. He does, however, have diagnosed difficulties with his processing speed, so often does not reach the 70% mark. Steve's parents promise him pizza if he gets full marks, or at least 18 out of 20 or more. So far, this seems to be working for Steve – 'I don't know how many [tests] I didn't get over 18... but I think I got quite a lot over 18. So, ja, happy days!'. He does, however, admit to getting anxious about achieving the marks his parents expect of him. He agreed with Panther about feeling the pressure of anticipating marks before the test, and said 'then you'll start to panic!'.

Shaq feels a great deal of pressure from his mother. He reported that she often wakes him up early to practise his spelling, and when he does get a good mark, he '…feels happy – because

she's mostly angry at me all the time'- she 'wants me to do better'. Spiderman feels he disappoints his mother if he gets 14 out of 20, or less, for his spelling tests. He acknowledges he gets poor marks for spelling, and gets upset when his mother says: 'why couldn't you try your best?' Spiderman feels he *is* trying his best. He is an English second language user, whose parents cannot really help him with his homework or spelling words as they struggle with English themselves. The family seldom speaks English at home as they are Xhosa-speaking. Spiderman longs to be understood, and to have his parents recognise how hard he is trying. He says: 'They [his parents] don't appreciate the mark that I get. They don't even appreciate what I'm doing'. Spiderman looked so sad as he said this. His body sagged in his chair, and his hands flopped into his lap, palms up – a gesture of helplessness. I could feel his unhappiness.

In contrast to Spiderman, Thomas did not feel the pressure to succeed as he feels his family understand his difficulties. Thomas feels his parents understand that spelling is a challenge for him, and so do not pressurise him to achieve high marks in his spelling tests. He does not, however, use this as an excuse - Thomas has a very good work ethic in all his academic subjects.

Both Bob and Will feel their parents value spelling and the ability to spell accurately, but do not seem to feel any pressure to get high marks in their spelling tests. Both boys feel their parents help and support them in their own respective ways.

FN simply does not like having to learn his spelling. He feels that learning to spell is a waste of time, as all schoolwork should be digitalised. He would then have Spellcheck and Grammarly to help him. He believes his mother does not really care much about the ability to spell, and so does not put pressure on him to learn effectively. FN often does not learn all his words, and will not remind his mother of this if she has not noticed it. He says: 'my mom doesn't really make me [learn the extra sight words]. She just made me do the three columns [of weekly spelling words]'. When asked why he did not remind his mother, FN said he did not want any extra homework.

The pressure to succeed with regards to classroom writing

All the boys in this study wanted their parents to be proud of them and their efforts in the classroom. This need to please was most evident when it came to discussing classroom writing with regards to applying their spelling. 'I want my parents to be proud of me [for putting in

extra effort] (Lloyd)'; 'I want to impress my mom [with what] I've done' (Tony); 'She's [his mother] proud of me cos I'm using complicated words that we haven't learnt yet. So, then she feels proud me, and I feel proud because she's proud of me' (Jack). Jack wanted to get recognition from his teacher for his efforts, as well, and would try harder with his writing: 'I'd use words that I knew the meaning of, but I don't know how to spell them - so that she'll be impressed. And I try to write a lot of big words. And then she'll be proud of me, and I'll get more marks because it's [the piece of writing] longer and it has more information'.

Mist reported that 'when I'm trying to impress my dad and mom' he would use bigger, more difficult words in his writing, even though he might get the spelling wrong. Mist went on to say that he wanted 'good marks and my mom to be proud of me, and my dad'. Like Jack, his teacher's approval is important to him. Mist will put in effort to produce a good piece of writing: '…then I know I'm going to be proud of myself cos the teacher's going to say well done to me'. Mist had a big smile on his face as he was talking about his teacher's approval - he likes it when his teacher acknowledges him.

Not all the boys, however, felt brave enough to use bigger, more difficult words in their writing – especially if marks were involved. With the exception of Lloyd, Tony, Jack and Mist, the rest of boys admitted to intentionally choosing simpler words that they could spell when writing sentences or paragraphs. Marks were very important to them – more so than being proud of the product they produce.

All the boys expressed worry or concern over having to write a paragraph or report in class if marks were going to be taken off for incorrect spelling. In all the interviews, the body language of the boys was similar – all of them slumped in their chairs, some looked genuinely horrified at the idea, all expressed concern on various levels and no one seemed keen to engage with such a piece of writing. Mist responded that he would be 'a bit shocked!' if he had to do such a task as he does not consider himself to be a good speller. Bob felt he would be 'nervous and scared' in case he got so many words wrong that he failed the task. Johny simply said 'Oooffff!' in response to my question, and added that he would be 'a little bit nervous'.

George, too, did not feel happy about marks being taken off for incorrect spelling. He said: 'I would feel nervous, and I wouldn't feel too good, cos what if the teacher said you're not allowed to use your dictionaries?' Thomas said: 'I would feel I must use very basic words' to get as few words wrong as possible. He added that he would feel 'very, very stressed' at the thought of losing marks for incorrect spelling. Tony echoed Thomas's sentiments: 'I must use

the words that I think are very basic and simple and that I know how to spell'. Both Moo and Oliver felt the pressure to get good marks for the piece of writing, and said they would be nervous to tackle the task: 'I would get a lot of words wrong because I would be under pressure' (Oliver).

Shaq summed it up for all the boys concerned about the marks for a piece of writing in which marks were deducted for incorrect spelling. He said it 'would be so nerve-wracking'. Spiderman added to this sentiment by saying he felt angry that the teacher would make them write this paragraph, as, after all, even teachers do not know how to spell every word!

The general consensus amongst the boys was that having to write a paragraph, or something similar, where marks were taken off for incorrect spelling, would not be fun to do. Most of the boys admitted they would make a conscious decision to use simpler words, and not words they would normally use when speaking. As a result, their written words would not reflect how they actually think, nor would the chosen words reflect their vocabulary. The thought of getting a poor mark was linked to the need to please their parents and teachers, as the boys did not want to disappoint, or get shouted at (Shaq), by these adults. The pressure of marks influenced their choice of words.

It was a different story with a writing task where no marks were taken off for incorrect spelling. When asked if they would enjoy writing a paragraph where spelling did *not* count, every one of the boys' faces brightened and they sat up straighter, eager to engage with the discussion. The comment that struck me most, came from Will, who said 'I can just write free. Like, whatever I want'. The sense of relief was palpable. Beckham also felt that he would not be afraid to try and use the words he wanted to use: 'I'm really happy that spelling doesn't count because then I wouldn't feel scared'. George echoed Beckham's sentiments: 'if spelling didn't count, I'd be so confident I would be done in 20 minutes'. Lloyd had a positive attitude towards his task, as he said 'I'd be more determined' to do well to please his parents. Lloyd went on to add he would 'at least try the word and take more time [over the task]'. Steve felt he would be 'a little bit more relaxed' about writing the paragraph. Thomas seemed visibly relieved with the thought of writing a paragraph where no marks were taken off for incorrect spelling: 'I would not stress as much and I would do a whole lot more complicated words, and I would do even words that I don't even know how to spell, and then I'd get help after. And then I'd get better marks'.

FN was a little more dramatic. He said: ‘Every time my teacher says that spelling does not count, I see fireworks going off in my mind!’. Spiderman felt the same: ‘I’d feel happy. Very, very happy – to the moon!’. Shaq had similar feelings. After having admitted he found the thought of writing a paragraph where marks would be deducted for spelling errors ‘nerve-wracking’, he almost jumped out of his seat when I suggested that the teacher would ignore spelling errors. He actually shouted: ‘Yes! Yes!’. Oliver admitted he would ‘be so excited. I wouldn’t be nervous’. Moo’s face lit up with a huge smile when he responded to the question about writing a paragraph where spelling was not counted. He said: ‘I would feel so happy!’. Moo knew he could put all his efforts into writing an interesting paragraph, without having the pressure of having to spell words correctly. He ‘wouldn’t work so hard on the spelling, and rather on the meanings of [the words] I wrote’. My understanding of Moo’s comment was that he would use the bigger words as he knows the bigger words have richer meanings and would choose them over the shorter words that, alth8ough he could spell them, do not have such rich meanings.

Conclusion

This group of 8- and 9-year-old boys feel a strong sense of the need to please the significant adults in their lives. In the classroom, this translates mainly to the marks they get for activities such as spelling tests and paragraph writing. The anxiety generated by pressure from parents to perform according to an extrinsic expectation (often unrealistic), affects how the boys learn their spelling, and how they apply spelling to their written classwork. Anxiety around writing a paragraph is definitely reduced when there are no deductions for spelling errors. The boys feel as though they can focus on producing a more meaningful product rather than having to give a great deal of time and effort to recalling the spelling of words. It seems as though the boys see ‘spelling’ as merely a mark, and not as a life skill.

Anxiety appeared in unexpected places – such as the worry and fear around the changes in the spelling programme and the format of the spelling tests. It seems that anxiety acts in a similar way to a biological virus: anxiety affects each child differently; it spreads to all areas of the child’s inner world, even areas we, as adults, could not have foreseen; it affects the child’s belief system and sense of self-worth; and it affects the way in which the child thinks and acts. When anxiety spreads to invade the child’s whole being and the way in which they view and

value something like learning and applying their spelling, then, just as a biological virus invades a population, anxiety becomes an inner-world pandemic.

It became clear to me that the spelling programmes the school used were not suited to the needs of the boys in this study.

CHAPTER 9: ‘English is an alien language!’ (Steve)

This chapter highlights further difficulties the boys revealed regarding learning and conserving spelling in order to be able to apply their spelling accurately in written tasks.

Spelling in English is complicated. The initial step to learning how to spell a word is to learn how the sounds of the different letters fit together to make an overall word. As understanding of the English language progresses, an appreciation and understanding that words may have the same sound but different meanings and spelling (as in the example of the riddle above) is developed. English is a difficult language in which to learn to spell. The original Anglo-Saxon language absorbed many words from historical conquerors such as the Romans and the French. As a result, there are a great many irregularities in spelling, making it particularly difficult to learn how to spell each of the sounds. Shaq was the only boy to acknowledge that he knew other languages had influenced how English words are spelt: ‘It’s got Latin inside it – why Latin?’. His facial expression registered horror. Moo was completely surprised by this statement of Shaq’s. He had been sitting quietly for a while, but his head lifted quickly when he heard this: ‘Latin?’.

The English alphabet has 26 letters, 44 different sounds – most of which are the vowel sounds – and 250 ways of spelling those sounds[6]. It is no wonder these boys have trouble remembering how to spell in English. Beckham had trouble remembering which spelling belonged to which word: ‘I know what they mean but then I don’t know how to spell them’. Steve found the ‘the silent letters’ hard to remember. Will observed: ‘there’s a lot of tricky words in English’. Will went on to give an example of a word he found hard to remember: ‘like ‘juice’. I don’t know that much [about] ‘juice’’.

Chapter 5 (The Literature Review of how Spelling is Learned and Applied) explained that the desired outcome of learning to spell is for conservation of the word (correctly remembering the word, its spelling, its meaning/s and its many different connections to other vocabulary) to occur. All 18 of the boys in this study struggled to apply their spelling knowledge to written tasks. This disconnect between the words they have learned and the words they choose to use in written tasks was reflected in their classwork.

[6] I heard this statement at a reading conference, but I am unable to trace the source.

Conservation of a word is the ability to learn how to spell it, save it to long memory and then to retrieve it, in its correct form, to use in a sentence. Linked to this, is the deeper understanding of a word – its meaning (or different meanings), its use in a sentence (which will dictate which of two words with the same sound is the correct word) and how it can be used in puns or other figurative language. For example, the answer to the spoken riddle 'What is black and white and red / read all over?' is 'a newspaper'. The key to understanding the answer, and finding humour in it, lies in understanding that 'red/read' have the same sound, but a different meaning and spelling. The conservation of spelling words in long term memory is heavily influenced by the amount of effort required to learn the words. This effort to learn and conserve words has many and varied sources.

Spelling words in isolation versus spelling words in a sentence

What alerted me to the fact that the boys were struggling to save their words into long term memory is that they spoke of the difference in levels of difficulty between spelling words in isolation in a test environment (the teacher calls out one word at a time and the boys write it down), and spelling words in a dictated sentence. George thought spelling a word on its own was easier: 'it's easier to quickly go through it [the word]. The sentences, they're longer, so you can forget words easier'. GG found the dictated sentences hard as he could not remember the words from the first term: 'cos it [the sentence] just suddenly pops up a word from last term, and you're in term three, and you suddenly can't remember how to spell it'. Steve is sometimes more worried about the other words in the sentence, so his ability to recall his weekly spelling words takes second place in his attention: 'sometimes there are big words [in the sentence], not the spelling words, that you have to think of. So sometimes you might forget the spelling words'. Thomas echoed Steve's thoughts: 'they'd given us these words to spell, and then you get one of the other words that you didn't practise [that week]'.

Spiderman finds everything about learning English hard – but in particular, learning how to spell accurately: '[spelling] in English? Difficult'. When asked what part of spelling was the most difficult, Spiderman replied that the dictated sentences were the hardest for him: 'The part when you have to write down a bunch of words [sentences]'. Spiderman's comment indicates he is struggling with a cognitive overload. He has too much to think about while he tries to complete his task, and expends a great deal of energy trying to do so. He went on to say: 'It makes me feel nervous. It makes me feel tired. It makes me feel 'what am I doing?''. Spiderman

really felt the pressure of not having the words easily accessible to his thinking. The cognitive overload Spiderman experiences seems to stem from having to think about too much at once when having to access how each word is spelled. Among other things, he has to: hold the sentence in mind; understand the general 'feel' of the sentence; understand the meanings of the words so that he chooses the correct spelling of the word; write down the correct spelling of each word, in the correct order; remember all the punctuation that applies to the sentence. Over and above all these things to keep in mind, Spiderman has to have the English words in his vocabulary on which to draw. This is not always the case, especially if he is distracted. He admitted to code switching while writing spelling tests, going from thinking in English to thinking in Xhosa (his home language): 'In one of my spelling tests, I remember now, there was a word I didn't hear properly, so then I just wrote a Xhosa word. And so she said, 'get out', right. Then I'm thinking about something else. Now I'm writing 'puma' because 'puma' means 'get out' in my language. So, I just wrote 'puma' and then she said do you mean the brand?' The drain on Spiderman's cognitive functioning is enormous. Coupled with the anxiety he feels around spelling tests or creative writing, it is no wonder he feels exhausted.

Steve admitted that 'I think the sentences stress me out the most'. He pointed out that spelling a single word is easier as 'you have to remember one word instead of remembering more words'. Will said: 'I think the callouts [spelling words in isolation] were easier. 'Cos I always got 10 out of 10 for the callouts'. The words, however, were not properly saved in long term memory, as Will went on to say: 'And I didn't get that much for the sentences'.

All 18 boys said that spelling words in isolation was easier than spelling them correctly in a dictated sentence.

Of the 94 quotes that were linked to conservation of knowledge, 51 quotes referred directly to the boys' inability to conserve and retrieve their weekly words in long term memory so that the boys could use them again, either in their dictation test, or in their classroom writing. Apart from any diagnosed biological or physiological impairments to learning, such as a slow processing speed, the boys revealed different reasons that contributed to their struggle to retain their words. For example, Johny felt overwhelmed with homework and so spelling was not a priority for him: 'You have too much homework to do, so you just forget them [the spelling words] completely on Friday [day of the test]'. Other boys expressed their thoughts about not being able to recall words before and after the test. Steve could not recall the correct form of

the word he had to spell when confronted with two possible spellings of the word 'I gotta choose one [of two words]. And when I choose the one, it might be wrong'. Steve went on to say: 'You would forget them [last week's words] cos you're trying to focus on a bunch of words that you'd studied [this week]'. Tony realised that 'now we're done with this week's spelling test. Gone forever. We don't use these words ever again. These words are gone from our memory!'. Tony looked very sad while he said this. He is a diligent student and wanted to 'learn those words to use them in our life' and not simply forget them each week. Jack was frustrated with not being able to remember his words from previous weeks: 'you would forget them 'cos you're trying to focus on a bunch of words that you'd studied [this week]'.

The boys' lack of interest in spelling

Two aspects of interest emerged. First, was the interest, or lack thereof, in learning how to spell with the aim of personally improving their own skills, and so becoming more proficient and accurate spellers. The boys revealed various personal reasons for finding spelling hard to learn and conserve, including how their own belief and value systems, as well as those of their families and their school, affected the boys' attitudes to spelling. Secondly, the interest, or lack of interest, shown by the boys towards the design of the spelling practice activities indicated that these activities did not help the boys remember, and so to conserve, their spelling words.

Personal interest in spelling

As with learning any new skill, there needs to be an initial appreciation of the value of the skill being learned. If we cannot see how the skill will help us, we will not be partial to putting in the effort required to master it. Not one of the boys in this study seemed to be interested in learning to spell accurately – they showed no enthusiasm to learn this skill. Instead, spelling was simply something that had to be done.

Spelling in English is difficult

The boys revealed various reasons for this disinterest in learning to spell. The primary reason for the lack of interest was that the boys found spelling just too difficult. 'It's not as easy as it used to be. The stuff [spelling words] that used to just come to me, and I could do it properly, now takes a little bit longer' (Beckham). GG struggled with 'the long ones [words]. I think Maths is easy compared to spelling'. Johny felt 'these days they give us hard words'. When

Thomas looked over the new weekly words for the first time, he feared that he would not 'get good results – these words are very hard'. George thought that spelling was 'a bit complicated for me', and both he and Lloyd found the applications of rules to be the most difficult part of applying their spelling, even though Lloyd sometimes used the rules (that he remembered) to work out a word's spelling. Steve summed it up for all the boys: 'Sometimes spelling does actually suck'.

When discussing the difficulties of learning to spell in English, Spiderman, who speaks isiXhosa at home, observed that 'English is hard. And not everyone knows how to speak English. So, it's hard spelling the big words'. Steve pointed out that 'English is an alien language!'. Although there was much laughter at this comment, I believe it has an element of truth in it. With its many adopted words from the languages of the conquerors, the English language has many different ways in which to spell the same sound (for example, the long <a> sound can be spelled 'ay'; 'a_e'; 'ey'; 'ai'), and many spelling rules have exceptions (for example, '*i before e except after c'*). Just as a student is learning to spell words with the 'ay' spelling (play; stay; hay; day; stray), a new spelling of the sound is introduced (rain; stain; train; explain). For students who struggle to learn spelling and to use the words in creative or classroom writing, English can, indeed, feel like an alien language.

Moo felt he did not want to put effort into an activity that he felt he was not good at, especially as there was so much else he had to focus on. He also had already worked out that spelling marks counted very little in the overall year mark, so his interest in learning to spell accurately was very low: ''cos these [spelling] marks don't make a big difference at the end of the year for our marks'.

The difficulty with spelling in English and its effect on the boys' beliefs and value systems around spelling

Some of the boys could see the value of being able to spell accurately. Being able to spell would get them better marks in tests and classroom writing, and would help them communicate better. Jack echoed many of the boys' thinking when he said that spelling was 'quite important, because it is like 90% of the things we do. Even in Maths, you have to spell'. Tony added, 'English, History – all of that. If you can't spell, people don't understand what you say'. Will expanded on these thoughts and said that it was important to know 'how to spell things because

you need general knowledge. You need to know how to spell things'. George felt spelling was important to him as it helps him to understand what he reads, and also helps him to write correctly. He said knowing how to spell makes it 'easier to read stuff and to write'. GG explained his thoughts on the importance of spelling: 'I think it's important because you gonna have to learn it [spelling] in assessments that you have to write'. For GG, having to learn spelling was mainly about marks. Beckham understood that spelling is 'important because it can help us learn more before we get to older grades'. However, in spite of these observations, many of the boys did not reflect these values when it came to their own personal practice.

Most of the boys saw the value of being able to spell accurately as a skill that would serve them well in the future. They understood the importance of accurate spelling, yet seemed to struggle to apply this understanding to their own practice. Their personal interest in improving their own spelling abilities did not seem to apply right now, in Grade 4. For example, Beckham saw a role for knowing how to spell in his future: 'let's say for example, that we don't learn properly, and then our kid asks for a word and we give him a wrong spelling and then *he* gets blamed for it'. Beckham added that being able to spell and understand the roles of homophones (words that have the same sounds but different spellings and meanings) is important to future communications with others. Will, too, looked to his future self: 'when I go out of school and I have kids, it will be important to actually teach them [spelling] with their homework'.

Bob felt accurate spelling would help get him a job later in life, especially if he had to present information: 'Because it [being able to spell accurately] will help you a lot in life. Like, it will help you in a job. Like for a presentation'. George also felt that being able to spell accurately would help get him a job: 'I think it [spelling] is important because when you get to high school, you need to spell out some long words. And once you're an adult – even if you are an adult and want to be a game ranger – you still have to write down stuff'. Oliver said he thought of spelling now, in Grade 4, as 'the building blocks for when you grow up. So, if you get a contract for a job – sometimes you need to know some words and if you sometimes spell the words wrong you might not get the job'. Moo echoed Oliver's sentiments about spelling being the foundation for the future. He said: 'And when you are making a newspaper and when you need to write down big words, and then you don't know how to spell them. So, it's quite important to start knowing your words now'. Even when Mist was specifically asked if spelling was important for right now, in Grade 4, he answered that spelling was important because '…you can fill in

forms. Like when you are asked to [fill in] passport forms and stuff like that'. He did not seem to think spelling was important for him at this time of his life.

Panther was worried about how other people would view him if he could not spell properly. He observed that 'if you spell a word wrong for the interview, or the email, and it gets posted on social media, or anything, there will be rumours about it – [your] spelling'. It made him feel 'quite scared'. Both Panther and Spiderman were worried about those rumours and what might be said about them if they could not spell. Panther felt people might say 'damn, you're stupid!' or 'you're an idiot!' – words 'that make you feel sad, sometimes, when you think about it'. It sounded as if he has already experienced those words. Spiderman feared something similar. He felt people may say 'Oh wow! This guy doesn't know how to spell. He must have failed some of his English assessments or wasn't very good at spelling'.

Perceived beliefs and value systems of families around spelling

Being young, and at the age where they still want to please, the boys in this study are still influenced by their parents, their siblings and their teachers. When questioned about their families' values around spelling, all 18 boys said they felt their parents valued spelling highly. George stated: 'Spelling is important in my family because we [George and his sister] normally study really hard. We take it seriously'. Johny said his mom takes learning to spell very seriously, and she makes him practise those words he gets wrong: 'We use spelling a lot in our family, especially my mom. If I ask her help for homework, and I said the answer and I said it wrong, she will ask me to spell it out'. Part of developing a personal set of values is learning these value systems from the significant people in our lives.

Steve gave reasons why his parents placed value in being able to spell accurately: 'my parents take my spelling tests and all my English and Afrikaans work very serious because they want me to be the best I can be. And they want me to pass all my grades. So, ja, we do take spelling very seriously'. He finds this emphasis on the value of spelling 'makes me feel kind of annoyed' because even when his parents return home from being away, and it is the weekend, they make him practise the spelling words then. Oliver's parents also had a good reason for valuing accurate spelling: 'My mother thinks it's extremely important 'cos when you read, you gotta know the words and you gotta understand what they mean'. Panther said: 'my parents take my spelling seriously – for me to get better at it'. Thomas felt his parents valued accurate

spelling, and they showed it because 'they help me a lot'. Mist, who has a diagnosed processing speed impairment, understood that his parents valued accurate spelling, but because 'my dad's good and my mom's good at spelling', they did not always understand how hard it was for him to learn and conserve his spelling: 'my mom, yes. My dad doesn't understand'. Spiderman also feels he does not have support at home, but for a different reason. Spiderman is Xhosa-speaking at home, and neither of his parents are able to help with English learning and spelling. He says: 'My mom feels it [spelling] is important, but she keeps on saying that English is hard because we don't usually speak English at home. She thinks it's important, but then at times we get into an argument 'cos we don't know what to do'.

Tony said: 'my parents, my brother and both my sisters think spelling is very important. As I said earlier on, that if you can't spell, you can't speak proper English'. Bob, too, looked up to his older sister as she often helped him with practising his spelling. He reported that she did not like spelling, but knew she had to work hard at it. Both Bob and his sister sometimes practised their spelling on the trampoline – testing each other as they jumped. Bob said: 'whenever I got something wrong, she would jump on me'. They made it a game. Panther acknowledged that his parents wanted him to become a better speller (see previous paragraph), and 'also my sisters'. He has seen how his parents place value on his sisters' spelling, and he knows that the same value will be placed on his spelling.

FN seemed unsure of what his parents really thought about spelling. Although his mother helped him learn his words each week, she did not always go through the whole list of words with him: 'I didn't really learn [all the words]. Me and my mom didn't really learn them [the sight words]'. FN admitted to not reminding his mother about these words because 'I don't want more homework!'. Sight words are words that have irregular spelling, and cannot easily be sounded out – for example, 'said', 'though', 'thought', 'the'. These words need to be learned rote fashion, and are difficult to remember as they have no pattern to follow.

Perceived beliefs and value systems of the school and the teachers around spelling

When asked how they thought the school and their teachers valued the skill of accurate spelling, all 18 boys agreed that the school and their teachers placed great importance on spelling. What all 18 boys seemed to feel, from the overall sentiment around the school's value of spelling, was that the school appeared to value learning to spell accurately for what correct spelling *gets*

you (i.e. marks) and not for what correct spelling *empowers* you to *do*. In their responses to the question, the boys used the terms 'school' and 'teachers' interchangeably – the teacher was included in the term 'school'. For ease of writing and reading, I have kept it that way. Panther was thoughtful as he answered the question, and he looked a little sad as he said: 'I think the school takes spelling seriously', and went on to explain that the school wanted 'you to get better marks, to get better grades, to go and get better at English, also at spelling. For you to get smarter'. Panther is a second language English user, and, having taught him in Grade 3, I know he struggles with reading, writing and thinking in English. I also know he puts huge store by the marks he gets, and seems not to appreciate that he is a good thinker. For him, high marks makes you 'smart'. Steve agreed with Panther. He said the school 'shows lots of affection for spelling, because they have lots and lots of booklets through the grades for spelling'. Thomas, too, thought the school felt spelling was important as he understood the school wanted to prepare him for the future: 'I think the school thinks spelling is very important because you can't really talk if you don't know how to spell, and you can't get many jobs'. Jack added his thoughts to the discussion and pointed out that 'the school thinks it [spelling] is very important' because the school wanted the students to 'try get higher [improved] grammar and higher [increased] vocabulary. And just try to get better'. Tony agreed with this thought and said, 'the teachers and all the interns want us to succeed and improve more'. Tony added an interesting comment which I am not sure how to interpret. He said: 'We pay the school lots of money just for our education, from our mum and dad. I think we must do extremely well in our school'. On the one hand, he could be feeling the pressure from his parents to do well at all his schoolwork, and he *must* do well, because they pay high school fees. On the other hand, he could be saying that because the school charges such high fees, the standard of education is higher, and so are the expectations of the students from the school. Higher expectations could mean the school values *all* aspects of learning – including spelling. Will observed 'I think since they have spelling tests' the school valued accurate spelling. He added: 'And I think this school wants you to learn how to spell everything. You get good students out of it. And it's good education, I guess'. I feel that this comment from Will reflects Tony's thoughts about the school's values around learning, and its high expectations of its students, and that the school does produce good students.

When I asked the four boys in Group 4 what they thought the school felt about spelling, all four boys sat back in their seats and sighed. Oliver let out a loud 'Yoh!' as he sat back. There was a moment of reflection before all four boys started talking at once. Moo felt 'This

[question] is even deeper [than being asked how *they* felt about spelling – a question that was asked earlier in the interview]'. Spiderman added that he thought this question was 'Way deep in the ocean!'. I interpreted this as the boys not having thought of it before, and it appeared to be a thought-provoking question – hence the small silence, and then everyone talking at once. Oliver began the discussion by saying: 'I think [the school feels] it's important because it's a school. You have to learn'. He added: 'they [the school] show it [is important] by giving you tests and assessments on English'. Spiderman, who is Xhosa-speaking, understood that the school is an English speaking environment: 'The school really wants you to know and learn English, because no matter what's going on, you have to learn English. You cannot just learn your own language'. Spiderman thought the school showed how serious they were about spelling by putting pressure on the students to learn properly: 'You have to know how to spell a word, you know. Because the school wants you to learn. The school wants you to know an English word. You cannot just say um… I don't know this. Or they not gonna give you help and say, ok. They might give you a little bit of a clue, but they're not gonna give you help exactly. You must learn this, so come on. Come on. Come on, you're older now. You must learn this. You're in Grade 4'. Spiderman spoke faster and faster at this point, and almost shouted the last words. He looked so upset that I thought he might cry. He was extremely emotional, and I could feel his frustration. I remember thinking how awful it must be to be so young and to have this enormous pressure on your shoulders. Shaq, who is Zulu-speaking, agreed with Spiderman's observation: 'The school thinks it [spelling] is important because they mostly teach in English and you learn more words, more or less, in History, English and Science'. I think that what Shaq meant was that he learned new words not only during English lessons, but also in the other subjects (such as the subject-specific vocabulary), and he had to know how to spell those words, too. Shaq went on to say that the school shows him spelling is important because 'The teachers are so strict! If you don't do your work, yoh! They [the teachers] will give you too many strikes! That's the message!'. Strikes are part of the reward and punishment system at the school. If a boy gets 3 strikes, he receives a Saturday detention. Spiderman also feared getting a strike: 'what has changed for me [since Grade 3] is about saying it [the school] is strict. If you don't do your spelling, especially spelling, you're gonna get a strike'. Moo also thought the school valued spelling highly. Each year, the school entered a group of boys into the Kid's Lit Quiz – an international competition that asks questions on any book ever written for children. This school's team had made it to the international finals, representing South Africa, for 4 years in a row. This obviously impressed Moo, who feels that if you cannot spell, you cannot read well. He said the boys who are in the team 'go to Singapore

for the Kids' Lit Quiz so they [the school] feel it's very important to read and find out about lots of different words'. He felt the school showed that they valued spelling (and reading) by rewarding those boys who did well.

Fear and the fear of failure can cause a great deal of anxiety in young children. It has been my experience that fear, fear of failure and anxiety experienced from pressure to perform all affect how much attention a child will give to a task, such as learning to spell. Fear of failure is complex. It may motivate some students to work harder in order *not* to fail. On the other hand, however, it may be such an overwhelming emotion that it causes the student to panic and not even try. Fear affects the amount of attention that is given to the learning task, reduces the student's working memory capacity (that part of the memory system that connects prior knowledge to new information, and helps conserves the information), and results in a poor learning experience. In the case of spelling, attention, or lack thereof, will affect the child's ability to learn, conserve and retrieve the correct form of the word. For Shaq and Spiderman, fear of earning a strike or a Saturday detention was a big deal. For Steve, it was a little different. He said: 'I think the school shows that they take spelling seriously, because they want you to pass your assessments and your tests'. He felt this pressure from the school to get good marks in the spelling tests very keenly. He felt that if he failed his spelling tests, the school would hold him back and would make him repeat a year of school: 'if you're in Grade 3 and you want to get to Grade 4, and you if haven't gotten over the mark that you need to get to pass to the next grade, you'll have to stay back'. The boys in this study appear to be experiencing great anxiety and fear around spelling.

Each of the boys, no matter how they understood the purpose of being able to spell accurately, did not seem to see, nor value, learning to spell as an activity in its own right – something to master for his own personal improvement or satisfaction - but rather as an activity that was linked very closely to performance, marks and pressure from different sources (see Chapter 8). None of these boys had experienced consistent success in their spelling tests or in their classroom writing, where spelling knowledge needs to be applied. As a result, not many boys had positive past experiences on which to draw when the learning got tough. Lloyd expressed his difficulties with learning to spell by saying 'I get so frustrated I just sleep'. Chapter 8 revealed that regular, anticipated failure, perceived or real, has led to the boys developing emotions such as feeling overwhelmed (Lloyd, Spiderman), anxiety over tests and marks (section 8.4) or pressure to succeed (sections 8.5). Chapter 8 section 8.4 also highlighted

emotions such as fear of failure (Bob, George, Johny, Thomas, Jack, Tony, FN, Mist and GG), helplessness (Spiderman, Moo, and Will) and a lack of confidence in their own abilities (Will, Mist and Spiderman).

The boys seemed to need to put a great of effort into learning their spelling words. They found spelling in English tricky and complicated due to the language's many ways of spelling one sound. This need for so much effort affected the way in which the boys placed value in learning to spell correctly. Yet, on the other hand, they understood that their parents, teachers and the school placed great value on being able to spell correctly. The pressure to please these significant players in their lives meant the boys had to work extra hard to achieve something they felt they could not achieve. So, whether the difficulties these boys experienced in learning and applying spelling affected their value systems around spelling, or whether their value systems caused the difficulties with spelling, is hard to say. I believe it to be a more mutual and intimate connection than a unidirectional one.

The unfamiliar spelling programme

Personal interest is not only about the value one sees in learning a particular skill. It is also about the personal comfort zone, or familiarity, with the task. In my experience, knowing what is coming, how to do the task and how to react to the task is important to maintain interest in a topic or activity. I have noticed that, when I ask the boys to do a task that is new to them, such as breaking the new spelling words into phonemic chunks they can spell, they have many questions about it: How long do we have?; I cannot do this; I don't know what to do; is it for marks? We spend more time getting ready for it and addressing the anxiety around their ability to actually do this task, than settling down to complete it. As we continue to practise the task each week, as it becomes more and more familiar, the boys are soon able to come into class, settle down and start immediately on the activity without any noticeable signs of anxiety. As explored in Chapter 8, section 8.1, the greatest source of anxiety around learning to spell, and having to apply that knowledge, seemed to stem from the changes in the spelling programme and the way in which the spelling tests were conducted. Any initial interest to engage with spelling would have started in Grade 1 and developed over the next three years – Grades 1 to 3. The spelling programme in Grades 1 to 3 was familiar to the boys and therefore predictable. The lessons were predictable, and the tests took the same format in each of the grades – 10 spelling words followed by 3 or 4 dictated sentences. There is a measure of comfort knowing

that all a boy has to do is remember how to spell his words. There was no anxiety over *how* the lesson or test were going to be completed. That format, and therefore the predictability, changed in Grade 4 – the grade in which these boys are currently. It changed in two ways: not only was the programme different, but also the method in which the boys' knowledge was tested. The boys in this study did not find any relevance and meaning in the programme (see Chapter 8, section 8.1), even after having used the programme for almost 7 months.

Getting used to a new method of learning to spell has not been easy for any of these boys. The boys were experiencing anxiety over the changes in the spelling programmes, together with the fact that the tests are no longer familiar or predictable. The boys had been taken out of their comfort zones they had developed in Grade 3. Although the boys had been using the new format for close to 7 months, they had, as yet, to find comfort and predictability in the spelling programme and test format in Grade 4. In addition to feeling confused, overwhelmed and anxious about failing, they felt they had to work extra hard to accomplish an activity they perceived as difficult. These negative emotions do very little to motivate a young 8- or 9-year old boy to maintain his interest in learning his spelling each week.

Personal appeal in the spelling tasks

In the Grade 4 spelling programme, the boys are required to do activities to practise their spelling in class and for homework. What emerged from the data was that the boys found these activities neither interesting nor useful. When Moo was asked if the programme helped to teach him how to learn his spelling, he said: 'It doesn't really'.

As described in Chapter 8, in Grade 3, the weekly words all contained the same sound - for example, the long 'e' sound that is spelt ' ea' (read, bead, leaf). It was easier to see the connection between the sound and the spelling of the words to be learned. Many words rhymed, so sometimes only the first part of a word had to be learned. For example, using the words given above, the 'r' could be replaced by a 'b' to change the word from 'read' to 'bead'. The programme allowed the boys to look for familiar patterns in the words.

The spelling programme used in Grade 4 (*Adventures in Spelling)* was described in more detail in Chapter 8, section 8.1. In this chapter, I will refer only to the aspects of the programme that are designed to capture the interest of the boys. In my experience, I have noticed how crucial

it is for the learner to be able to pay focused attention on a task so that learning can take place. Part of capturing a child's attention depends on the novelty and relevance of the task.

Instead of learning words that share a common sound as they did in Grade 3, the words for each week in Grade 4 are centred around a spelling or grammar rule, and the weekly words are chosen to fit that rule (see figure 8.1). The activities designed to practise the spelling draw on prior knowledge (vocabulary) and the deeper meanings of language, such as knowing opposites, similes, homonyms and homophones. Some activities each week do not even relate to the rule or the spelling words (see figure 8.1).

Some boys have not made the connection between the words to be learned and the rule for the week. When asked if the fifteen weekly words related to the rule, Moo, Oliver, Spiderman and Shaq all said no. These fifteen words for the week *did,* in fact, relate to the spelling rule but the *activities* did not always apply to the words or the rule. So where, in Grade 3 the words had similar sounds, the words in the Grade 4 spelling programme shared a common rule. If the boy could not remember the rule (as Lloyd and George found difficult – see page 5), the words would be even harder to learn. Oliver pointed out that one of the activities the boys were given to practise their words was a crossword which gave a definition of a word, and the boys had to write the word into the crossword. Oliver felt this activity did not help him to learn and remember his spelling: '[there is] a crossword where you have to answer questions – it asks you and you have to guess what that word is. Sometimes it doesn't help, cos sometimes in a test there's no definition so it doesn't really help'. It felt like Oliver was trying to find predictability in the test. I feel Oliver's use of the word 'guess' is significant, as it indicates he does not have instant access to his vocabulary, his understanding of the meaning of the words or the spelling of the words. This means he has not effectively conserved the words, their meanings or their spelling. Moo agreed with Oliver. He said: 'And then it [the spelling activity] says 'suffix these words', and it doesn't even link to what we're doing. It only links to our assessment'.

One of the many aspects to learning something new is to have an element of fun or interest or novelty about the activity to initially hook the student's attention. It needs to be noted here, that novelty can be complex. Initially, an activity or strategy can be novel, such as the first time a crossword is used, but, if given too often, the appeal and the novelty can wear off. It is quite a balancing act for teachers and spelling programme developers to achieve.

There were 12 references to the fact that the boys did not find spelling fun. By 'fun', the boys were not referring to an activity that would have them getting out of their seats and laughing or shouting, but rather activities such as playing games that would help them learn and remember the spelling of the weekly words. Beckham found spelling in Grade 4 was 'just not as fun as it used to be'. He continued: 'We play games [in Grade 4], but not as fun as we used to play'. The 'game' Beckham was referring to was a short section at the end of one of his weekly sections in the AIS book that gave the boys clues in order to complete a sentence containing some of their weekly words. He looked very sad at not having the 'fun' spelling games that he played the previous year. In Grade 3, Beckham played many games with his spelling words – for example, Fishing (a memory game the aim of which is to match pairs of words), Lotto (where groups of four cards with the same word needed to be collected, and the players could 'steal' piles from each other to do so), Snap (matching words with the same sounds in them) and Bingo, to name a few. Beckham went on to say: 'In Grade 2, I liked spelling a lot because my teacher was kind about it. She made fun stuff with it'. Now, in Grade 4, he finds spelling difficult and not much fun at all.

Tony, too, would like to find fun in learning to spell: 'When I spell easy words, I know "Ja, that's easy. Ja, I like it". And it's fun. It's easy for me'. However, Tony, too, found learning to spell in Grade 4 difficult. He felt 'we learn those words to use them in our life', but he understood that he did not properly conserve the words, as he noted that 'now we're done with this week's spelling test. Gone forever. We don't use these words ever again. These words are gone from our memory!' For the more difficult words, Tony said: 'when I get to hard words, that's what irritates me. That makes me want to go look in the dictionary'. For Tony, this meant he had to put in extra effort – having to leave the task and use the dictionary affected his time to complete the task, as well as breaking his thinking while doing the task. He did not find this fun (or easy). What Tony highlights is that he finds it fun if he feels he *can* do the task, when he feels he *will* succeed. He did, however, have a positive twist to this as he said: 'When I look in the dictionary, I also learn a lot of words while I'm looking for one word'.

The amount of effort the boys have to put into learning and applying their spelling does not make spelling fun, either. The novelty of the spelling activities did not holding the boys' interest, and therefore made learning the spelling rules and words that much more difficult. There are 75 references that refer to just how difficult spelling is for them – either learning it or applying it. Panther said: 'I think I spell great because I practise every single day', yet he is

still anxious about his marks: 'Sometimes I'm worried about what I'm going to get for my spelling test'. Panther struggles to access his knowledge so that he can apply his spelling effectively: 'Sometimes I'm, like 'what's this word again?' and I write the wrong answer. And I get angry and frustrated'. Jack says he stresses for the '…first ten minutes' when he receives the weekly words for the first time, 'because I'm reading through the words and [I feel] there's too many, and I'm not going to be able to spell them, and they're too hard'. Even before he starts, he understands he will have to work hard to learn and remember the words. Beckham feels the same. He said: 'I actually feel scared that I've got to practise a lot'. Starting a task with high levels of anxiety, and the pressure of having to put in a great deal of effort, would not hold anyone's attention or interest – especially 8- and 9-year old boys. From the start, spelling is not fun.

It does not seem to be much fun practising at home, either. George, GG, Will and Beckham were the only boys to mention using technology to help make learning to spell fun, or at least enjoyable. George explained that the app on his iPad, called *This Week's Words,* allowed him to set up his own banks of words (the weekly spelling words), and then used these banks to play the games. He said: 'I use an app that helps me. If I spell it wrong, then it says "wrong"'. However, George went on to say that 'the app was not always helpful'. The game moved quickly, and he did not always have time to complete the spelling of the word: 'I sometimes get frustrated, but normally it has helped me. It's like a goal-setter'. GG said he used an app on his phone (he could not remember the name of it), but admitted to no longer using it. Beckham said he had an app that he used, but could not remember the name of it either. Will said his app was called *A+,* but he, too, did not use it often. From what I understood, it took time to load the words into the database of the app, which the boys often did not have time to do. Will said his mother helped him do that, but only sometimes.

The other boys practised their words in isolation (writing one word at a time). This is rote learning, as mentioned in Chapter 4 (p 73). Their parents called out the word and the boys wrote it down. They write the word, check it and rewrite it if it was wrong – sometimes many times. Thomas, who prefers to spell out his words orally ('I don't like having to write the word down – I'd rather say it out') finds writing and rewriting words on paper boring. 'Boring' could mean 'not interesting; tedious' (Google dictionary). 'Boring', in an educational setting, could also mean the student does not see the value in what he is doing, and so does not want to engage with the task. For example, Tony shouted: 'Oh, it's so boring, why will I need to know this?' when talking about writing the words down as practise. FN, who finds the physical act of

writing difficult, would much rather all schoolwork be digital (including spelling). He suggested that 'instead of using books, you should use iPads, like tablets, so you don't use paper'. FN agreed with Thomas in that he preferred to spell his words out orally: 'you can say it out [loud], without writing. It [writing] may hurt your hand'. Having worked with FN the previous year with his spelling, I knew he found the physical act of writing an extremely difficult activity, and would try to avoid it if he could. FN felt he could still learn and be tested on his spelling by using a device. He could then avoid the actual writing of the word and could 'at least type it.'

The element of fun

The previous two sections revealed what the boys thought about their spelling activities and tests in the light of their personal interests (their value systems of spelling and how the skill of being an accurate speller contributed to their personal development as a student) and the appeal, or novelty, of the spelling activities. A third aspect contributing to how the boys learned and conserved their spelling words that emerged from the data was that of bringing an element of fun to their spelling tasks and activities. To be able to store and retrieve spelling words accurately, the attention of the student needs to be held. The activities need to be relevant to the students' interests, pitched at the correct level of understanding and ability, and have an element of fun. This will ensure that working memory can be engaged effectively, and that the neural pathways in the brain can be reinforced to form a long-lasting memory of that word.

When the boys were asked to think about how they would prefer to learn spelling, most of the boys answered that they would like to make spelling fun. Steve said he would find it fun to unjumbled words, and so find it easier to learn his spelling: 'I would ask the teachers to change spelling by mumbling [jumbling] up the spelling words'. He continued: 'And the mumbled-up words are at the end of the sentence. And then you have to take each word and put it in the right position [in the sentence] and spell the right word'. When asked for clarification, Steve said it was a game – one that challenged him to apply his knowledge of how the word is spelled, unjumble the words and then place these words in the correct place in the given sentence. Panther echoed Steve's idea, but felt he would prefer simpler words: 'I would put them mumbled [jumbled] like 'bat' into like 'a_t_b', or 'cat' or the spelling words. And I would make them quite easy - for our class to get better at the learning'. Panther is an English second

language user, and would not have the same access to knowledge of words and language that Steve, whose home language is English, does. Hence Panther's wish, to 'make them [the spelling words] quite easy'. Both Steve and Panther would require different levels of difficulty to capture their attention for the task.

Steve went on to add another way in which he would like to learn spelling. He enjoyed matching the spelling word with its definition: 'So, in Grade 4 now - and I think they do it in Grade 3 - you have to write the word's definitions… Like 'strawberry - a red fruit'. And you had to draw a line [from the word 'strawberry'] to the right one [definition]. Like ot would say: a) strawberry… and then you had to match it to the right definition [number 1,2,3…etc]'.

Thomas agreed with Steve and Panther: 'I think, also, to make spelling fun'. Thomas, who finds it difficult to unjumble words, went on to describe the activities he uses at home to make spelling more fun. He prefers a more hands-on approach to practising spelling: 'What we do at home is we put shaving cream on a table and then we draw in the shaving cream'. Thomas had a huge smile on his face as he remarked: 'It's really fun!'. FN said he did the same kind of thing, but 'we do that in the shower'. Jack had another suggestion on how to make learning to spell more fun: 'I'd make a game. If you got it [the word] right, you'd get something, like a sweet. And then the more you get right, the more sweets you'll get'. He explained his rationale behind using rewards to encourage the boys to learn their spelling: 'Cos then they'll study it [spelling] harder so they'll get more sweets'. FN took it one step further and linked rewards to marks: 'I'd say if you get 75% or over, you'll get a sweet'.

In response to the question *If you were the teacher, how could you make learning to spell easier?* there were 46 comments that showed the boys had thought about how they struggle and what they, or their teachers, could do about it. Beckham remembered that he liked spelling in Grade 2 because 'my teacher was kind about it. She made fun stuff with it'. Now, in class in Grade 4, he admits to thinking about how he could teach spelling better than his teacher: 'I would make fun stuff like sometimes when my teacher's teaching - this is weird of me – I imagine what I could do better'. Beckham went on to say: 'I would make it [spelling] fun. And then I'd go check everyone's work and I wouldn't make the work so hard. I would do what you [the researcher] are doing now. I would ask the kids 'what's easy for them?', because I don't want to push them. 'Cos if I push them too much, then they're not gonna *get* the work, and then they are just going to get a lot of homework [if they do not finish their spelling in class]'.

Bob felt it would be best to start with the easy words and work up to the harder words. With the harder words, he suggested a particular strategy: 'You could start off with the basics, like learning all your vowels and alphabet. And then you can move on to small words like 'at' and so on. But when you got to the big words you put them [the words] in front of them [the students] and see if they could spell it. Like, look at it, look away and spell it'.

GG, George and Johny felt the teacher could be of more help, especially during a classroom exercise. GG said the teacher needs to be more observant: 'Well, you [the teacher] could just look at them [the students] and picturise what is going on in their head. And then, if they're struggling and thinking too much, and looking up to think, then you know that they need some help'. George agreed with GG that the teacher must be more observant: '[the teacher would ask] is everyone done?' and then some boys say 'no' and then you can say 'keep your hands up and I will come to you'. And then you can just help them through'.

Johny felt the teacher could take on more of a 'coaching' (Johny's word) role: 'I think you [the researcher] can teach them two times a week, and maybe during the spelling test you can walk around. If you see that someone got the wrong answer, maybe you can tell them an easier way and help them, but don't give them the answer'. The 'two times a week' referred to the spelling support lessons the boys received with me in their Grade 3 year. These lessons happened once a week, which is why Johny felt that twice a week would be more helpful. One of the strategies to remember the spelling words was to 'link their thinking'. In other words, think of another word with the same sound that the boys *know* how to spell, and see if a letter could be changed. For example: change the 'r' in 'croak' to an 'l', and the boys could spell 'cloak'. Lloyd agreed with Johny about the specialised help being useful: 'if they're struggling maybe, like I was last year, I think I would send them to you [the researcher] [for extra help]. Because that helped me a lot last year'.

Tony responded immediately to this question. He said: 'I would make it more fun for them'. He went on to explain that he would 'teach them fun ways how to learn it [spelling]' such as teaching them a strategy, for example using mnemonics, to help the student remember the difficult spelling. He said: 'for 'said' - 'South Africa Is Dry'; 'because' – 'Betty Eats Cake And Uncle Sells Eggs'. His reason for using this kind of fun strategy was 'it makes it easier for us to *know* [remember] the words'.

Making learning to spell more fun for Oliver, was to extend the students. He said: 'You [the teacher] can put your own words [on the list] and then they [the students] can give you another

word based on that [spelling sound]'. He feels this kind of extension could help the students link their vocabulary and existing knowledge: '[the extension can] help you with your spelling, like, go further than just those words [on the list]'.

Spiderman would make spelling more fun by using his whole body: 'you would use exercising. Like jumping'. He explained further: 'Like *Mia and the Bee*'. This was a movie about a young girl who enters a spelling bee competition. One of the strategies she used was to jump, or skip rope, and as she jumped she would spell the word out. Spiderman said he kicked a soccer ball to achieve the same effect. He went on to say that he would be a popular teacher as he would not make the students write words on paper: 'They [the students] might say I'm the best teacher in the world, because I'm not going to give them paper. I'm not going to give them paper to write on. We either do board games or we go on the computer. Because board games can help you, you know'.

George enjoyed using the spelling words in context. In Grade 3, he was in a spelling support group, and one of the activities was for the group to create a story using the spelling words. He said: 'making up your story was so helpful because then you could the learn words. Maybe you run out of time [in the support lesson] and then you can't write them down [to practise]. You can remember what you said last week [in the story]. So that helped a lot'.

Both Shaq and Moo felt the teacher could give opportunities for more practise. Shaq said: 'they [only] give us assessments of those words'. On enquiring further, Shaq said he wanted to practise, but in a different way: 'That would really help'. Moo felt more practise would be useful, along with a strategy. He said 'Do lots of worksheets for them. Sound the words out'.

Will was the only boy who had not really given thought to how he could improve his spelling or how to make learning his spelling words easier for himself: 'I haven't really thought about that. Mmmm…not really…not anything I've thought about'.

The boys seemed to need to make a hard task more fun. It was even suggested that to motivate the boys in their spelling tests, the teacher could offer rewards such as sweets (FN), chocolate (Tony) and stars (Lloyd). They seemed to intuitively understand that in order for them to keep focused on learning their spelling words and to help conserve the words, they needed to find the activities relevant, personally interesting, different and pitched at the right level for their own particular needs. The activities also needed to have a fun element to them. This need to have fun to make a difficult task more bearable brought to mind the words from a song in the

Mary Poppins movie – *'a spoonful of sugar makes the medicine go down, in the most delightful way'.*

Time and opportunities to practise spelling words

In Chapter 8, I wrote about how the data indicated that time, the lack of time to learn their spelling words and the lack of time to complete their spelling tests, caused great anxiety in the boys I interviewed. In this chapter, time is important for a different reason. What emerged from the interviews was that the boys felt they did not have enough time to learn their spelling words, nor did they have meaningful opportunities to use and practise these words. These two elements added to the anxiety felt by the boys around spelling.

More time in the week was needed

As mentioned in Chapter 8, many of the boys felt the pressure of not having enough time to practise and learn their weekly spelling words. This caused a great deal of anxiety in all the boys. As it stood at the time of the interviews, the boys were given the spelling words and activities on Monday morning. They had until Thursday morning to complete all activities as well as practise the words at home. On Thursday, all activities were marked in class, the teacher checked everything, and the books were returned to the boys in time to take them home and do final revision for the test the following day. During the school week, there was one 45-minute lesson on a Monday morning dedicated to spelling. In this lesson, the words were discussed in detail – how the words relate to the spelling rule, any spelling anomalies (such as any silent letters, blends such as 'sch' in 'school'), and the meanings, or possible multiple meanings, of each word. The week's spelling activities were explained, and the boys then completed these activities for homework, or in class if the opportunity arose. In the language and comprehension lessons, the weekly words were included in the discussions. Previous week's words were also included in the discussion if they appeared in the text/s being worked on. In the language lessons, the words would be included in the lessons on grammar – how they related to the terms such as verbs, adjectives, antonyms, synonyms, homonyms and homophones as and when the opportunities arose.

I decided to take a closer look at how much time was available for dedicated opportunities with which to learn the spelling words. In a telephone conversation with the Grade 4 teacher (see Chapter 8, section 8.1), she mentioned that in the Monday's 45-minute spelling lesson, the time was used for explanation and clarification. There would not have been much time to

individually practise writing the words. In the language and comprehension lessons, the emphasis was not on spelling but rather, understandably, on developing knowledge of the deeper structures of the language. There were not many dedicated opportunities to practise the spelling words. In the afternoons and for homework, there seemed to be very little time available to the boys to spend on practising spelling. The general understanding at the school is that Grade 4 boys should not spend more than an hour doing homework each day. However, this is seldom the reality for any of the boys. The teachers who teach Maths, Afrikaans or isiZulu, English (including spelling) and Integrated Studies all add a little bit of work to the boys' homework tasks. It all adds up. At best, the boys will have about 5 to 10 minutes a day in which to not only complete the spelling activities, but also to practise writing and learning the spelling words – *if* they do their spelling each day. Many of the boys in this study admitted to only learning their words the day before the test. Thinking realistically about the amount of time the boys would have to dedicate to learning to spell, I would estimate the boys would have about 50 minutes a week to learn and commit to long term memory 20 words every week. This estimation includes: 5 minutes a day for 4 days as homework, and possibly 10 minutes in each of the spelling, language and comprehension lessons. Even so, the spelling practise in the language and comprehension lessons would be oral, not written. Of the time available, both in the classroom during the week and at home, I am not sure how much of it would be spent in actual attentive learning and not simply 'getting it done'.

All the boys admitted that they felt the workload, in general, had increased from Grade 3 to Grade 4. This increase in the volume of work affected the way in which many of the boys approached their spelling, and therefore affected the boys' abilities to conserve their spelling words. Leaving the learning of the weekly spelling words until the last moment was a common theme amongst the boys. Beckham mentioned that 'I'm doing my homework really late now' because of all his extramural commitments. He added, sadly, 'There's a lot of homework actually' and learning his spelling was not a top priority in his week. Lloyd felt the same: 'We get home, we start the homework. But I've got so much homework. I've got to practise spelling, piano, Smart Tech homework. And then we have to go and bath, eat dinner, read and go to bed'. Johny said he had so much other homework, that his spelling was left until last: 'you have too much homework to do, so you just forget them [the spelling words] completely on Friday'. Another boy who left his spelling until the last moment was Jack. He admitted 'I haven't really been studying for them [the spelling tests] because I've been studying for the assessments. Only the day before [the test] I'll remember I have a spelling test'. Tony, too, was so focused

on learning for his assessments that he 'only worried about my [spelling] tests on the day before'. FN observed: 'They shouldn't give us homework in the week with our assessments. Not doing our other homework [like spelling] that's not so useful in our assessment'.

This kind of practice does not enable effective learning of words. It merely allows the boys to 'learn just in time' – to learn their spelling words in time for the Friday test and so *only* for the test. The boys seem to be learning their spelling words by rote (see Chapter 3, paragraph 3). These words are then 'gone from our memory!' (Tony). Oliver experienced a similar situation. He said: 'words that she [the teacher] would say would come to me immediately, and sometimes the words in the sentence wouldn't come to me. And the callout – sometimes I can't really hear the words, or I just forget how to spell them'. Moo found it very difficult to remember and recall the words he had learned the day before. The spelling test was on a Friday at 12h00. By then he was tired, and could not remember what he had learned so that he could to apply it to the test: 'So, I forget the words as soon as it's break [before the test]. Because it's the second last lesson of the day. And it's on Friday, so I fall asleep'. Perhaps it was not only the time of day that was tiring for Moo. He had spent the previous 4 days trying to learn his spelling words, knowing he will probably not remember the words. The test is the second last activity of the week. The prolonged anxiety and stress causes an emotional overload, resulting in poor performance.

Jack indicated he would like more time to practise his words when he suggested that the spelling should be done over 2 weeks. He thought it would be better to use the two weeks to practise and then have the test at the end of the second week. He said: 'You wouldn't do it [the test] for the one week. Do it the next week and then see if the marks got higher'. Thomas felt the same way, but for a different reason. Thomas has been diagnosed with a processing speed impairment, which makes it hard for him to recognise the sound-symbol connection quickly, and so struggles to read and to spell. He is aware of this, and does use strategies to help him learn to spell the words. He also understands that he *needs* more time for learning to happen. This is over and above the volume of work, homework and his extramural activities. Thomas suggested having two weeks to learn the set of words. He said: 'I would make it [the time for practise] two weeks before [the test], because then they [the boys who struggle to learn the spelling] would stress for the first week, and then they would say, ok, I know these words – it's gonna be fine'. Beckham felt he needed more time to learn his words as he was finding the volume of work too much. He said he needed more time because 'it takes a longer time for me

to work out what to do'. Here, Beckham is referring to the activities in the AIS book that he needs to complete each week. Although some sections are constant (a spelling rule with 15 words to practise that rule), other sections can be unrelated and therefore misleading. For example, in one week's activities, there was a section that reflected back on how to spell the Maths numbers that had nothing to do with the spelling rule. Beckham finds this unrelatedness confusing, and therefore finds he needs more time to figure out what to do.

Time enough to practise is critical for learning any skill. It seems the boys in this study did not feel they had enough time to learn their set words. No sooner had they learned, and been tested on, a set of words, then they had to learn a brand new set of words 2 days later (the test is on a Friday, the boys get their new list on a Monday). Watching the body language of the boys while talking about time, practice and remembering words, I felt very sad, and more than a little angry, for these young boys. They bodies and facial expressions indicated anxiety, frustration and helplessness. They are still young, and yet spelling – such a fundamental part of the written language – is already something they seem to feel they cannot succeed at. It is seldom fun, and they feel pressurised to learn and to learn quickly.

The lack of opportunities to practise spelling words

As with any developing skill, once the basics have been explained, there need to be many opportunities in which to practise meaningfully. By 'meaningfully' I mean to consciously practise in a manner that will that develop and enhance the skill, so that it becomes second nature. The more automated a skill becomes, the less effort will be expended in having to recall it, and the more working memory capacity will become available for other kinds of thinking, such as coordinating thinking and getting thoughts on paper. In the case of learning to spell, there needs to be enough time given to practise the words on their own – hearing them, seeing them, writing them - as well as using them in context through writing and other relevant activities. At school, with limited time available to practise spelling, the boys were not afforded many opportunities in which to consciously practise. As mentioned in the previous section, the lessons during school seemed to be more about explanation and clarification, and about completing the activities, rather than to dedicated practice for writing and remembering the words. The busyness of the school day did not seem to allow time enough for opportunity to practise the words meaningfully. When there were opportunities, practise was diluted with activities that included other aspects of learning the language – such as grammar. I acknowledge that some spelling learning takes place, and for those boys who find spelling easy,

perhaps this was enough time to learn the words. But for the boys in this study, whether they were first- or second-language English users, it is not enough time.

In the afternoons, for homework, because time was tight for most of the boys, I wanted to find out what kind of practice the boys did, how often they practised and which methods they used. All the boys believed they practised or studied hard for their spelling tests. But it seemed to be just that – learning for a test. Their aim seemed to be to get good marks for the weekly test, rather than wanting to learn the words so that they can remember them and use them at a later date.

Johny felt he worked hard at his spelling. He knew he needed to put in the effort as 'I only remember them if I go through them every day'. Johny's efforts, however, do not result in his committing to memory what he has learned. As mentioned in the previous section, Johny forgets his words by the test on Friday. When asked if he had to work hard for tests, Bob said: 'Yes, for my spelling tests. Normally, I would study a lot. And I would test myself sometimes. My mom makes me practise in the mornings [on the way to school], and at night'. When I enquired as to how he practised, Bob replied 'My mom just calls out the words to me and then I write them down. Sometimes, she will put the words on the piece of paper and jumble up the letters, then I have to spell it out. It's harder than the normal way [calling out the word].' Bob said he 'sometimes' practised using the spelling words in dictated sentences.

GG, Panther and FN believe they practised hard. All three practised in a similar manner – that of writing the words down on paper. GG said: 'I copy the words down three times, and then I say them three times each and then write them down on paper'. Panther says he, too, practises every day: 'I practise very hard. Every day when I come from school, my mother's like 'let's practise for your spelling test''. He practises by unscrambling the words: 'Sometimes my mum will scramble the words, I need to put those words together. Also, they [other family members] would call out the words and definitions, like they do it in Grade 4'. Panther likes to practise in the same way in which the tests are run. This could be his way of finding comfort in familiarity – one way of reducing anxiety in a test situation (see *Personal Interest* above). He seems to practise for the *test*, and not for retention and understanding. Panther believes he is doing something right as he feels 'I spell great because I practise every single day, and I get a good mark on my Friday test'. His applied spelling in written classwork and creative writing, however, tells a different story (see Chapter 10).

Steve thought he practised very hard, but by using a different method to the boys in the paragraph above: 'I study hard, but I do it in a different way. I only leave it [to be tested by his family] for the Friday morning. I do test myself in the week and look at them [the words]. Sometimes my mom takes me to school – but mostly my dad – and my sister comes as well. They test me and then I have the words running through my brain. Because, if I get tested on Thursday, I might forget about the words. So, we do it on Friday morning while we are driving to school, so it's gets in my head more… so I can keep on just replaying it in my mind'. Like Panther, Steve seems to be learning his spelling only for the test. He is, however, overloading his working memory by trying to keep all those words in mind, while having to cope with other classroom demands until the time of the test.

For FN, it is a huge effort: 'I practise really hard. If I don't get it right, my mom will make me write it again. And then, if I get that wrong, she'll make me write it again until I eventually get it right'. It is double the effort for FN. Not only does he have to put in effort to learn his words, but he also has to expend a great deal of energy *writing* the words, as he finds the physical act of writing difficult. Thomas, who also has a physical impairment in that he has a slow processing speed, practises every day, but especially 'the day before [the test] I have to do a lot – I have to do it three times'. Like FN, Thomas does not like to write, and prefers to practise his spelling orally. This, however, does not help Thomas to remember how to *write* the word.

Two boys who did not often practise writing their words are Will and George. Both boys made use of spelling apps on their devices. The apps allow the user to create their own bank of words, and then 'tests' the user through various activities. Some games have a time element to them, while others simply test the spelling. Will said: 'she [mom] puts in the [weekly spelling] words and then you press 'test' - it is just basically like a little spelling test'. When asked if he practised writing his words as well, Will said: 'No, I never really practise like that'. George explained how he uses the app: 'I use an app that helps me. If I spell it wrong, then it says 'wrong'. If I get it wrong twice, then it [the app] just loads them [the spelling words] back down a level. I need to get to the top to finish. And sometimes, if I don't make it, it'll just go back to the bottom'. When asked if he practises actually writing his words on paper, George responded 'It is kind of writing - you have to type in on the keyboard'. This does not, however, help George practise his hand-eye coordination with remembering how to write the words. Lloyd pointed out, quite aptly: 'I disagree with George because I think typing on a keyboard is

harder because it's on the iPad, flat, and you have to go and look for the letters. But when you have a pencil, you can do it quicker and write it better'.

Lloyd, of all the boys in the study, seemed to have the most effective practise methods. He and his mother varied the activities, and seemed to find many more opportunities to practise than the other boys did. Lloyd also wrote the words down 3 times, but then took it further: 'So, first I write every single word on paper, three times. And after that, my mom asks questions and sometimes it's in the car where I have to spell it out. And sometimes it's at home, where I have to write it down. My mom calls out the meanings and I have to say the word [oral practice]. I have to spell it [written practice] and say the meaning'. In his practising, Lloyd is consistently linking the word to how it looks, how it sounds, how it is written and its meaning – especially if the word has a homophone (same sound, but a different spelling and meaning, such as 'red/read').

Lack of time to practise spelling in the school day allows for few opportunities for the boys to consciously, or meaningfully, practise their spelling. The boys have to find opportunities to practise at home, but this, too, is difficult as there is still so much else they need to do. Some boys only practise writing the words. Some use technology to help them, and so do not even get to write. Some incorporate aspects of language such as meanings, antonyms, synonyms and homophones into their practise. Wherever and however the boys find the time and opportunities to practise, it does not appear to be enough for the boys to retain and accurately retrieve their knowledge of spelling.

More time is needed for the second language English users[7] to learn their weekly words

Lack of time and not enough opportunities to practise will affect second language English users more than those boys who use English as their first language. These boys are Spiderman, Johny, Panther, GG and Shaq. Johny, Panther, GG and Shaq all said they use English at home, although it is not the only language used. Spiderman and his family speak isiXhosa, and seldom use English. The first four boys' parents could, and do, help their sons with learning English, but Spiderman's parents could not. His father was at work when Spiderman did his homework. His mother was not able to help in the way Spiderman needed, although she was there to

[7] There is a large body of research that deals specifically with second language acquisition. It does, however, fall beyond the scope of this study.

supervise his homework. He said: ‘It’s hard for me because in my family, we only speak one English word or two words or some. But I’m used to a family where nobody speaks English – they will just speak Xhosa. Just Xhosa. Now it’s confusing having to learn English on this side [Spiderman lifts one hand, palm up], having to learn Xhosa on this side [lifts the other hand, palm up]’. I got the feeling that Spiderman was finding the balance hard to strike.

I like to think of learning to speak, understand the nuances of, and writing in a second language as being similar to a right-handed person having to learn to write with their left hand. Perhaps their right hand had been injured, and was out of action. Initially, the person has to understand that this new way of writing is necessary, and will ultimately benefit them. In other words, if they could find the value in learning the new skill, they would be able to complete necessary writing tasks. What was once familiar – the ability to write without having to think about the mechanisms of writing - is now instantly foreign. It will require a conscious effort to learn to write with the ‘wrong’ hand. What the brain, arm, hand and fingers could do automatically before, now has to be learned from scratch. The brain needs to rewire its thinking processes in order to make new neural connections to allow the left hand to function as a writing tool. Without going into the deeper, scientific details involved in changing the writing action, skills such as how to grip the pencil, how to angle the wrist or arm to allow smooth passage over the page, how to adjust the page or book to enable a comfortable body position and how to form the letters and words need to be relearned. The right hand has had years of practise forming the letters (for these boys, it has been at least 4 years), so this skill comes, for the most part, automatically. The brain now has to consciously think about how to get the left hand to produce letters, words and punctuation – all while holding on to the thought and ideas it wants to express. It creates a huge physical and cognitive load – in some cases, an overload. The writing process becomes slow. It is initially messy. Spacing and organisation of the writing are a little off. Learning this new skill needs time and opportunity to improve.

And so it is with these 5 young boys, having to learn to speak, spell and write words in a second language. New English vocabulary has to be learned for words that they are already familiar with. They need to relearn the combinations of letters that make up the sounds in English. To do this, they need time to allow their brains to make new neural pathways to remember the ‘foreign’ words. They need time to learn and practise the words, and they need opportunities to practise the words meaningfully.

All 5 boys felt the pressure of the increase in the volume of work in Grade 4. They felt they did not have enough time to learn their weekly words properly. The learning pace seemed to be too fast for them. As mentioned earlier, Johny pointed out that he had so much homework, he could not learn his words well enough to retrieve them in the Friday test. And Spiderman felt he needed more time to think and write in the test situation. He said: 'But the sentences – she keeps on rushing every time. Ok, so you got half of the sentence then you just write out random words and then you just lose marks. Continuously'.

Of the 5 boys, Spiderman, Panther and Shaq showed the greatest emotions around learning and retrieving their spelling words. These 3 boys spoke animatedly and with passion about the pressure and anxiety they felt. Their parents appeared to push and pressurise their sons more so than the parents of the other boys in the study. Or perhaps it was that these 3 boys felt the pressure to perform and keep up more keenly. GG and Johny appeared more relaxed about their spelling and how their parents reacted to it.

Interventions

When I speak of interventions, I am talking about the measures the school takes on behalf of the student to support the student's academic progress. In Grade 3, there were two different forms of intervention available to boys who struggled to learn and apply their spelling. The first intervention was to identify the boys who had trouble learning and retrieving their spelling knowledge. These boys would be sent to me, the academic support teacher, to have extra practice in learning and writing words, or to address fundamental knowledge that was missing (such as an awareness of the phonemes that make up words) or to learn strategies with which to learn spelling. This happened once a week, for 45 minutes, in a small group during the spelling lesson timetabled as part of the school day. The boys were taken out of the class lesson, and did their spelling words with me, in my classroom. In addition to this, I would make suggestions to the teacher as to which strategies the boys use to help them in class, and also to the parents to help their son at home. If these interventions were not sufficient – if the gaps in the boy's knowledge were too wide, or the time needed to remediate the issues could not be met by the academic support teacher – the teacher would suggest sending the boy to a private Speech and Language therapist. In some cases, both interventions were used in conjunction with each other.

In Grade 4, however, there is no time available in the school day for the boys to attend dedicated spelling support lessons as there had been in Grade 3. The teachers rely on the spelling programme, fitting the spelling words into other language lessons, and on the advice and strategies suggested by the academic support team. Again, the teacher could suggest sending the boy to a private Speech and Language therapist for support.

Will, GG, Lloyd and George felt quite strongly that boys who struggle with spelling in Grade 4 should be able to have the support lessons they had last year, in Grade 3 with me, with an academic support teacher. All 4 boys felt it had helped them a lot. Even though now, in Grade 4, they seem to have forgotten some of the strategies taught!

Although it is neither an intervention nor a strategy, *all* boys receive a spelling concession in Grade 4, but only in test or assessment situations. This means that no more than 5% will be deducted from the overall mark for spelling errors. Marks are deducted for incorrect academic language spelling (for example, if the correct spelling needs to be known for geographic terminology), and also for transcription errors (if the words used as part of the answer are already in the question or text). All other incorrect spelling, as long as it is decipherable, is accepted. Teachers are also lenient when it comes to classwork, and will correct any errors on the boys' part. Sometimes, the boy will be required to do spelling corrections, where he has to write out the correct spelling for the word 3 times. Although this policy addresses the marks situation, and attempts not discriminate against boys with spelling issues, it does not help these boys to learn, retain and retrieve their spelling words.

Strategies to use for learning to spell and for conserving the words in memory

Make practice fun

It was very interesting talking to the boys about strategies they use with which to learn spelling. When asked how they would like to learn to spell, all the boys responded by saying they would learn better by making spelling fun. Whether it be games, the use of technology or working for rewards, the boys felt spelling, and the teaching of spelling, would be easier if there was an element of fun to it. Yet only Thomas, FN and Spiderman gave specific examples of techniques they used to bring fun into their spelling practice. Thomas said: 'What we do at home is we put shaving cream on a table and then we draw [write] in the shaving cream. It's really fun'. FN

responded to Thomas by saying: 'we do that in the shower'. Spiderman told me he uses physical activity such as kicking a soccer ball while learning his spelling. He says one letter for each kick. Jack, Tony, FN and Thomas referred back to their Grade 3 year where their respective teachers encouraged the boys to get high spelling marks in their tests by offering them rewards – either sweets, chocolate or stars to put on a chart. But no-one mentioned any reward system in Grade 4.

George, Will and GG mentioned they used technology to bring fun into learning their spelling. But GG went on to say he does not use it anymore, and George admitted 'I sometimes get frustrated, but normally it has helped me. It's like a goal-setter'. Both George and Will said they seldom wrote their words down on paper to practise, preferring to use the app and therefore type the words using the keyboard. This, however, does not help them to remember how to link up the letters while writing to make up the word. It seems the boys know what they would *like* to do, and that having fun could help them with their spelling, yet they admit to not doing it.

Break the words down and look for clues

Of the 18 boys in the study, 7 boys said they used the strategy of breaking the spelling words down into smaller phonemic segments that they knew they *could* spell. For example, the word 'tramp' could be broken down into 'tr' + 'am' + 'p'. Johny, very proudly, said 'I break them up. I sound them out'. Jack said he stresses over having to spell long words ('they're too hard'), but his strategy is 'you just gotta break them up. Like, find ways to make them shorter and make them easier to remember. And then you know them'. Bob knows that, in theory, that is what he should do, but in fact he only uses the break-down strategy 'sometimes'. He prefers to learn the word by rote repetition – writing it on a piece of paper over and over – 'if you got it wrong, then you would flip the piece of paper over, and you'll write it again'. Jack went on to say he looks for clues in the words: 'I just try to find the key word [root word]' and felt confident he could work out the rest of the word. Oliver, too, looks for clues. During the test, he listens to how the teacher *says* the word: 'you get an idea [of how to spell the word] when she's saying it. How she says it. So, you go back into your mind, you look at other words and you see if there's an 'e' at the end and you know that you have to spell that word'.

Mnemonics

GG, Lloyd, George and Jack all mentioned that they use mnemonics to remember difficult words. For example, GG said he used the phrase 'Betty Eats Cake And Uncle Sells Eggs' to

remember how to spell ‘because’. George uses the mnemonic ‘Waddle Oh U Lazy Ducks’ to remember how to spell ‘would’. These were mnemonics taught to the boys in Grade 2 and 3. While it is a good strategy to use, these boys had not made up their own mnemonics for new words they found difficult – it was not a strategy they used to learn new words. Jack mentioned he would try to make ‘a riddle that’ll help me remember it [the spelling word]’, but I am sure he meant a mnemonic. He did not, however, give me an example of what worked for him.

Practise as if it were a test

Using this strategy of practising spelling at home in the same way as it is done during a test in class helps bring predictability, and therefore helps develop a comfort zone (see Chapter 9, page 11). It helps reduce anxiety around the test situation. As anxiety affects the capacity of working memory, reducing anxiety means working memory has more ‘space’ to hold other information – such as instructions, terminology and thinking space - needed to effectively retrieve spelling knowledge. This is what Panther and Shaq both seem to want to achieve. They said they practised their spelling words in a similar format to the test. This has served Panther well, as he feels confident in the test situation because he knows what is coming. He said: ‘my mum scrambled [the words] and I need to put those words together. Also, they [his family] would call out the words and definitions, like they do it in Grade 4’. Shaq told me ‘my mom always sets up a worksheet when I come back home, and then I have to do it. So, then they [the teachers who set the test] might put the same picture that I get’. Johny said he occasionally used this particular strategy, but only for some parts of the test – he practised his weekly words using antonyms and meanings: ‘I practise my spelling on a piece of paper, and then my mom says the words out. Or she might say the meaning, or the opposite’. Bob thought practising in the same way in which the test is laid out was a good strategy but admitted, when asked, that he seldom uses this strategy.

The use of a dictionary or a thesaurus

This was not a popular strategy! Although Will, Shaq and Oliver said it could be a good strategy to use when you do not know how to spell a word while doing classroom writing, none of them actually did. Will said the teacher would give them the word should they need to know how to spell it. He shrugged his shoulders as he said this, and his facial expression seemed to say ‘so why bother with a dictionary?’. Both Shaq and Oliver advised others to use a dictionary, but did not do so themselves. Tony said he had to use the dictionary at home if he wanted to know how to spell a word as his parents felt it would be better for him to find it himself.

Other strategies mentioned

Both Johny and Lloyd used the strategy of finding opportunities to practise their spelling words, and not just relying on the limited time available to them. Johny's mother helped him learn other words as well, and not just the weekly spelling words. He told me 'when we are on the road, sometimes she [mom] sees a sign, she might say that word and she might tell me to spell it out'.

FN writes the sound of the week at the top of his test page to help him remember how to spell the word. This was a skill we practised the previous year when he was in Grade 3 and came to me for spelling support. This only helps in a test situation, though. It does not help him to work out a word he wants to spell when doing written tasks in class.

Both Beckham and Will felt it would be a good strategy to ask for help. Beckham, however, would not ask for help himself – he was very emphatic about that. When I enquired as to the reason he would not ask for help, he replied 'I just can't. I don't know why'.

Will, on the other hand, relies too much on help from the teacher. He seldom uses the word break-down strategy because he believes 'I can't really break down that well. I'm not very good at breaking down'. He also admits to not consistently practising his spelling words during the week: 'Sometimes I feel confident [in a test], sometimes I totally feel like I don't want to do this because I've barely learnt the words'. Will admits to not using a dictionary, and even when he writes a piece of creative writing for marks he says that he could 'always go to her [the teacher] for the spelling'. When writing a paragraph where no marks are deducted for spelling errors, Will feels he can just write the words and 'and then she [the teacher] will just correct it for me'. Throughout the interview with Will, I got the sense he did not care much for learning to spell accurately. I felt he went through the motions each week, without putting in much effort into to learn and retain his words. At one point, Will said he felt people were born with the ability to spell – it just came naturally to them. He observed that 'some people are generally good at spelling. They are born with a passion to spell'. Will believes he is not a good speller – that he was not born with this passion. He went on to say that these good spellers do practise, but he has yet to make the connection between practising to improve and his own lack of strategies and practise to improve his spelling. He feels he is not a natural born speller, and nothing can change that. He has what Carol Dweck calls a fixed mindset when it comes to his spelling skills. As a result, he does not put a great deal of effort into learning and conserving

his words through the use of strategies and practise. He relies heavily on the teacher to correct his errors.

Lloyd and Johny prefer to *write* out the words as they say them, while Thomas prefers to say them *orally*.

Lloyd believes that 'the rules can also be part of the strategies', but went on to admit he did not always remember the rules when he needed to know how to spell a word.

Beckham believes that, when all else fails, guess! Whether it is in a test situation or when writing in the classroom. From having taught Beckham in his Grade 3 year, I know he is a phonetic speller – he spells the word as he hears it – so I am sure his writing is decipherable to those teachers who mark his work. If he made errors, he would then have to write out the spelling corrections 3 times. I am not sure this is the most effective way for Beckham to conserve his words, but it is a kind of strategy on his part.

Overview

When I looked at the overall picture regarding the conservation of spelling words, it became clear that most of the boys had settled on 1 or 2 strategies to help them – whether it be breaking down the words into smaller phonemic chunks, using mnemonics, making use of technology, trying to make the task of learning words a little more fun, or even taking an educated guess at spelling a word. What I did notice, was that most of the boys practised the words in isolation – just the word on its own – even if they used other ways in which to know what word they had to spell (such as using antonyms, synonyms, homophones or homonyms). No-one mentioned consistently practising writing those words in a sentence where the load on working memory is greater. Steve, Panther, Will and Moo have settled on their preferred strategies in Grade 4, but none of them remembered learning these strategies from our lessons together in Grade 3. At least Steve had the good grace to look sheepish when he said this (I was his spelling support teacher the year before)!

Most of the boys said they practised their weekly words hard during the week, and some boys reported that they get good marks for their spelling tests *if* tested in the words alone. As soon as it came to applying those words in a sentence (such as a dictated sentence) or using the words in their classroom writing, most of the boys found they could not remember the words.

Their efforts and the time they spent practising was not helping them to retain their words. These boys seemed to be learning their words simply to get good marks in their weekly spelling test. They did not appear to want to learn their spelling to further their own knowledge, or to improve their own skill.

Conclusion

The boys in this study are emerging readers and writers. Spelling is a skill that needs to be explicitly taught. As with any new or developing skill – be it learning to swim, tying a shoelace or learning to spell – you need to be able to conserve what you learn so that it becomes a habit or an automatic action. To achieve this, you need an initial interest or passion. You need to believe that the skill is something that will add value to your way of life. You need time to practise, opportunities to practise and a coach to help you perfect your skill. You need your instructor, or teacher, to give you helpful hints, tips and strategies on how to overcome possible difficulties. You need to be able to understand what you are doing wrong, how you can do it differently and how you can develop it into a habit, or automatic knowledge. You need to learn the skill in such a way as to accommodate your level and pace of learning – a progressive programme of instruction and meaningful and purposeful practice. Finally, you need to *want* to put in the effort to improve.

The data has revealed that the boys in this study do not want to put effort into learning their spelling. The data showed that the spelling programmes the school makes use of did not provide progressive instruction, nor did they afford the boys opportunities of meaningful practice. In fact, many of the boys did not seem to be able to see the relevance of some of the activities in the programmes. The data also revealed that the boys seldom made use of effective strategies with which to help them learn their spelling words. This meant the boys did not seem to be able to lay down, activate and strengthen the neural pathways (Shell *et al,*2010) in such a way as to make their spelling knowledge easily accessible, or even automatic. As result, these boys had little to no interest in developing their spelling skills. This was evident in their lack of application of accurate spelling to their written work.

It is difficult to put effort into something in which you do not see the value, or to put effort into something you have come to believe you cannot master.

CHAPTER 10 – 'I can just write free' (Will)

Before embarking on this research journey, I had many conversations with teachers about the discrepancy between learned and applied spelling of some of the young children in their classes. So often, the teachers would tell me that the boys had wonderful verbal skills and vocabularies when speaking or doing a speech, but when it came to writing – whether it be a creative paragraph or answering comprehension questions - the boys' choices of words were more simplistic and did not reflect what they were capable of. I had also chatted informally to the boys about this phenomenon of their spoken word being so much stronger than their choices of written words. Their replies indicated that that their over-riding emotion about writing tasks where marks are taken off for incorrect spelling, was that of a fear of failure. If they used easy-to-spell words, they would not lose marks. In these conversations, the children had also revealed that they often did not remember how to spell words from one week to the next, which caused them great anxiety. I was curious to know what emotionally-driven thinking on the part of the boys could affect this lack of conservation of words, and what emotions drove the choices the boys made when doing writing tasks in class. I understood at the time that some boys had physiological impairments to learning and recalling spelling, such a poor processing speed or poor audio / visual processing speeds. But I was left with a dilemma - some boys who had no diagnosable impairment found learning and applying spelling words difficult, whereas boys who did have impairments found ways to overcome these impairments.

The data presented in Chapters 8 and 9 revealed *how* the boys could not draw on their prior knowledge of words when writing paragraphs in class, and *what* affected the learning and conservation of the words respectively. The data in this chapter speaks more to the emotions behind the word choices the boys made – *why* the choices were made. This data analysed in this chapter reveals that the boys' conscious choice of words when engaging with classroom writing is heavily influenced by anxiety around accurate spelling and a fear of failure.

In Chapter 8, I presented the insight that it was the boys' anxiety which affected their ability to learn their weekly spelling words. This anxiety came not only from a fear of failure in writing tasks, but also from a variety of other sources: changes in the spelling programme from Grade 3 to Grade 4; changes in the test formats from Grade 3 to Grade 4; the lack of time each week to learn their words, whether it be lack of time in class or lack of time in the day for homework; the lack of time in the tests to complete the different sections; the pressure from parents and

teachers to get good marks in the tests and writing tasks; and the boys' personal identities as spellers and writers. This anxiety permeated nearly every aspect of the boys' academic environments – both their behaviour in the classroom and their inner state of being regarding their decision making and behaviour towards spelling.

In Chapter 9, it became evident from the data that there were yet other factors that contributed to the boys' inabilities to conserve their words in long term memory, and to make more adventurous choices of words when writing. The data revealed that the boys felt they did not have enough time to practise their words, and that the boys often did not have meaningful opportunities to use the words in context. The boys felt that the element of fun was missing from the spelling activities, which negatively affected their personal interest to develop their spelling skills. When I asked them about the strategies they could use to learn and remember their spelling words – strategies they had been taught by me and their class teachers the year before – most of the boys admitted to having forgotten about the strategies they had been explicitly taught. The lack of time to practise meaningfully, the lack of the element of fun and personal interest, together with not being able to remember strategies that could help them to learn their words, made the already difficult task of learning and applying the words even more challenging for the boys in this study.

The findings presented in both Chapters 8 and 9 affected the boys' choices of words when engaged in writing tasks.

Prior knowledge

The boys' understanding of the kinds of words they are expected to use in writing tasks

In order to more fully understand the possible reasons why the boys chose the easy-to-spell words over the more advanced words they would normally use when speaking, I phrased my questions in two steps: first, I wanted to find out what the boys understood of what was expected of them in a writing task. Secondly, I wanted to learn whether they put that knowledge into practise when they wrote. So, during the interviews, I asked the boys for their advice for a hypothetical boy their age who had trouble writing paragraphs to the best of his ability. I phrased the question as follows: 'I had a group of boys, just like you. And I was helping them with spelling. The one boy said to me, that if he knew spelling counted, he would only choose small words [when he wrote a paragraph], because then he knew he could spell them. He

wouldn't choose the words that he would normally *say*, because he was scared of spelling them wrong, and then losing marks. So, what kind of advice would you give that boy?'.

There was an over-arching sense of empathy and sympathy for the boy in my question. It seemed to me that these 18 boys in the study had experienced this kind of situation before. The kinds of advice varied, depending on the individual practices of the boys in the study. Of the 18 boys interviewed, all but one boy had some kind of advice to offer. Thomas struggles with all aspects of reading, writing and learning to spell. He puts a great deal of effort into all his learning, but he felt he had nothing useful he could offer the hypothetical boy in the way of advice for improving his writing.

The boys knew what to do and their advice reflected their own practice

When thinking about the kind of advice they could give to help the boy in my question to overcome his difficulties with classroom writing, 14 of the 17 boys who offered advice made suggestions that reflected their own practice. Bob had a good self-image of himself as a speller. He felt he was 'ok with my spelling' and he said he practised hard to learn his weekly words. He used different strategies such as: jumping on the trampoline while he spells his words; looking at the word, covering it, writing it and then checking it; and his mother jumbled up the words for him to spell correctly. Bob drew on his experience to advise the hypothetical boy to 'try some big words and maybe they would get easier if he practised them'.

Johny expressed a great deal of empathy for the boy in the question. He sat straight up in his chair and very solemnly said: 'I would agree with that boy. Because if he used big words, like some he might not understand, or if he got too excited [nervous?], he would use words that he has not spelt [learned]'. Johny's advice was to use 'small words' so as not to lose marks. Yet Johny went on to reveal a sense of hope for improvement, as he said: 'but maybe later on you [the boy in the question] can use the big words so you can practise them'. Although Johny practised hard to learn his weekly words, he is a second language English user, and admitted to finding English spelling difficult to learn. He told me he practised hard because his parents wanted him to succeed. But, in spite of the hard practise, Johny still chose to only use the small words when completing a written task.

During the interview, Lloyd reported that he received a lot of help with learning and practising his weekly words from his mom. He used this experience of parental help to advise the boy to

‘go home, tell his mom. Say “mom, I don’t know these words. Can you teach me or tell me an app where I can learn about bigger words?” Or he could read a dictionary’. Lloyd’s mom helped him in finding different ways in which to practise his words, and this was reflected in Lloyd’s advice to the hypothetical boy. He went on to add: ‘Or, write long words down if you get them wrong. So, get a daily thing [daily habit] of finding words like ‘unstoppable’ and ‘swimming’ and all those things. And then write them three times each day. And if you get them right, every day, you go to the next thing where your mom writes a few longer words. I think that’s a good start’. Lloyd’s advice echoed his own practice.

George has a processing speed impairment and so has to work extra hard to learn and conserve his spelling words. He has a good work ethic and is hopeful he will one day be a good speller. George uses his device and a spelling app to help him practise and remember his words. His advice to the boy who found spelling big words in paragraphs difficult was to: ‘download the words, because if you get it wrong, it will tell you and you can keep on trying. And then, just try your best and see what happens. And if you try your best, you might get it right, you might get wrong. You might even just get a mark for trying really hard, because your teacher knows you don’t like using long words. So, maybe you’ll actually get a really good mark’. George’s hopeful advice was exactly how he handles learning and applying his spelling, and it reflected his positive attitude towards his schoolwork.

Like George, Jack gave some very encouraging advice: ‘try and listen to people that are older than you to see what their vocabulary is like [so you can learn from them]. Because if you feel proud of yourself, you’ll try to push yourself, and then you’ll use bigger words’. He went on to explain that if he (Jack) used bigger words, his teacher would ‘be proud of me because I’m using complicated words we that we haven’t learnt yet. So then she feels proud me, and I feel proud because she’s proud of me’. Jack felt this was valuable advice to give to the hypothetical boy struggling with spelling and writing. He was very encouraging and enthusiastic with his advice, and he sat forward in his seat as he spoke – as if he was eager to get his message across to this boy. Earlier in the interview, Jack had mentioned that he liked to listen to his older brother and parents talk and discuss things as he felt he learned more words and more about words. This, he said, helped him understand his spelling words better.

Steve answered my question with no hesitation at all. His facial expression was one of encouragement - he had a small smile on his face, and he sat upright in his chair, reflecting his

confidence in his answer. His advice was simple: 'Never be afraid to get something wrong. Mistakes only make us stronger, and we learn from our mistakes'. He was sure the boy in the question would ultimately succeed if he just kept trying. Panther, who was in the same group as Steve, agreed. He said: 'he must spell the words that he knows. To practise every day, like me and Steve Rodgers'. When I asked again what kinds of words (relating to the difficulty of spelling of the words) they would advise this boy to use, both Steve and Panther said they would tell him to use 'simple and big' words. Steve added that: 'because if you use only hard words, sometimes a sentence might not make sense. And if you only use simple words, it won't make sense either'. I think what Steve was trying to say, was that sentences needed a mixture of simple and big words to make them interesting. I need to point out that at this stage of the interview, I got the feeling that Panther seemed unsure of how to answer my questions, and simply echoed, or rephrased, Steve's thoughts. Each time I asked him if he wanted to add anything else to Steve's comments, Panther declined to do so. He seemed unable to think of his own ideas to help the boy, or perhaps he did not feel confident enough to offer something different. Having taught Panther the year before, I understood that echoing someone else's thinking was his 'go-to' response when faced with a difficult choice of thought or action. Both these boys put effort into learning their spelling words, although both boys struggle to apply their knowledge when it comes to written work. Their advice to the hypothetical boy reflected their own practice.

Tony felt that the boy in my question should use the words he knew. Tony felt that if the boy knew the word's meaning, how to use it and any other information about the word, he should 'rather use it instead of using the other (more difficult) words'. In other words, stick with what you know. And this is exactly what Tony admitted to doing when completing written tasks.

Moo, Shaq, Spiderman and Oliver took time to think about their answers – no one had a clear idea as to what advice they could offer. They all thought the boy should use only small words, as he would then get no marks taken off for spelling errors. Shaq and Oliver felt the boy could use a dictionary, while Spiderman said the boy could try and break the words down to make spelling the words easier. But Moo pointed out that so many words have the same sound but different spelling, so he felt it was safer to advise the boy to use small words. A little further into the interview, both Shaq and Spiderman changed their minds about their advice. Shaq said the boy could try using bigger words, but Shaq had forgotten that the question was about using bigger words in *writing* tasks, as he said: 'the boy could just use big words if he has a speech

or presentation or something like that'. Shaq's thinking emphasised many teachers' concerns, namely: the often very noticeable difference between a child's written and verbal language. Spiderman said: 'he could use big words, but at times he could also use small words that he can actually say and spell. Because you cannot just go to your mom or look in a dictionary'. From having taught Spiderman the previous year, I knew him to be a hard worker, and he had a positive outlook to his learning. Even though he reported that 'English is hard and not everyone knows how to speak English. So, it's hard spelling the big words', he still puts effort into learning and writing his English tasks.

Mist reported earlier in the interview that he struggled with learning new words and felt he did not have a good vocabulary. He felt he had good spelling skills, but struggled with the physical act of writing – his hand would get tired if he wrote many sentences – and felt he did not have enough vocabulary to use (or spell) the bigger words. He felt that good spellers know and use 'fancy words' and advised this hypothetical boy to 'practise often how to spell big words, fancy words'. This, Mist thought, would impress teachers and parents. Impressing the significant adults in his life was important to Mist and boosted his confidence. He felt the boy might feel the same way, and so be encouraged to try using bigger words.

Will admitted to finding *all* aspects of spelling and writing difficult. He said: 'it [spelling] takes a long time - all the handwriting and all the sentences and the punctuation'. Here, Will is referring to the activities in the *Adventures in Spelling* book the school uses to teach spelling. Will is usually a quiet boy who does not offer his thoughts often, so it was difficult to distinguish between personality traits or apathy in much of our discussion. From his responses to other questions in the interview, such as his admission that he did not practise his words consistently and that he said he would prefer to get help before even trying to spell a word on his own first, I sensed that Will had given up on putting too much effort into learning his spelling words. His comments indicated that he relied heavily on extrinsic help, such as from his teacher, and that he did not show much motivation to try to learn his spelling words for his own development as a speller. His advice to the hypothetical boy reflected his own practice. He said: 'just spell big words, because if you hand the work in, people will check it. And the teachers will check it and then they can help you. They can help you spell words'. In other words, don't worry too much about spelling accurately as other people will correct your errors and will help you find the words you need.

The boys knew what to do yet their advice did not reflected their own practice

For the remaining 3 boys, their advice to help the boy in my question improve his classroom writing skills was contrary to their practice. Beckham immediately related to and empathised with the hypothetical boy. Beckham said: 'I would also be scared. Remember that time when my class teacher was strict? Sometimes I didn't know the words, and I didn't know what they meant. Other times I knew the words, but I didn't know what they meant. I was terrified of using the wrong kinds of words'. The word 'terrified' showed the extent to which Beckham feared the mark he would get for his writing. Although Beckham's emotions and practice towards choosing words to use in written tasks reflected that of the boy in my question, his advice to this boy was: 'I would have said to him: you don't have to be afraid, and if he was sad, I'd say just like you told me: ask for help. Unless it's in a test. If it's in a test, you can take a guess. Try syllables. Spell them out slowly'. Yet, when I enquired if he, Beckham, would ask for help, he emphatically shook his head and said: 'No! I just can't. I don't know why'.

FN felt that the boy in my question should use the words he knows, but should also try to use the bigger words as well. He said: 'try some bigger words and ask your parents to help you'. Yet FN does not follow his own advice. He admitted to using only simple words in writing tasks where marks are taken off for incorrect spelling. Like Beckham, FN's practice of consciously choosing simpler words in his own writing tasks reflected those of the boy in my question. But FN offered hope to the boy by advising him to try difficult words and to get help.

GG understood the boy's problem: 'He chooses smaller words because he's afraid of getting things wrong'. He agreed with George and said: 'I would just give him [the boy] a link to this app where you can edit what you want and then put in the list of that week's spelling words'. Although GG advised the use of a spelling app, he had admitted earlier in the interview that he no longer used the app as a strategy for learning his spelling.

All 18 boys in this study were aware of their conscious choice of words when doing classroom writing tasks. The boys all drew on their own experiences, whether positive or negative, and used this knowledge to pass on advice to help a hypothetical boy experiencing similar difficulties to them. Each one of the participants exhibited empathy for the boy, and offered encouragement and hope. Of the 17 boys who offered advice, 9 boys suggested the boy in the question should use the words he knew how to spell rather than the bigger words he did not

know how to spell. They did, however, offer encouragement in that they advised him to get help (5 suggestions) and to keep on trying (9 suggestions). After all, as Jack pointed out, if this hypothetical boy succeeded, he would feel proud of himself, and would keep on trying. I found this inspirational as these young boys found applying their knowledge of spelling, and the act of writing, very effortful.

Emotions

The boys' emotional responses to two different writing tasks

The general principle in the school regarding assessing the application of spelling is that marks are deducted for transcription errors – words that are already in the question or text that the boys do not copy correctly. The cap for the deduction of marks for any form of incorrect spelling is 5% of the total mark for the activity. Any further spelling errors do not carry a mark deduction. This applies to *all* boys in the grade, irrespective of their spelling abilities. In addition to this, specific subjects have specific academic language that the boys need to learn. For example, in Geography, the boys are expected to know how to spell words such as 'volcano', 'lava', 'magma' or 'Earth'. Marks could be deducted for incorrect spelling of these words. The boys are told before they start to revise for the assessment whether they would be expected to know these words and would therefore be required to spell them correctly in the assessment, or whether no marks would be taken off for these subject-specific words.

In my teaching practice, when I assigned written tasks to the boys, the first question was 'is this for marks?'. When the answer was 'no', there was generally one of two reactions from the boys. Either the boy would be more fully engaged in the task and would appear to have fun exploring what he could do; or the boy would not put a great deal of effort into the task, believing that if it did not carry marks, it was not important enough to put any effort in. I found this really sad. Sad that these young 8- and 9-year old boys were constantly under pressure of marks, and sad that when being presented with the opportunity to do an activity where marks were not a threat, the boys reacted in such polar opposite ways. It was either an attitude of freedom to do what *they* thought would reflect their thinking and their ability to respond to the task, as well as how they wanted to do the task, or one of not caring enough to put effort into the task.

The boys in this study were very aware of the importance given to marks in any form of classroom activity. In Chapter 8, I presented the boys' emotions when preparing for, and writing, spelling tests. These spelling tests, however, are not the only written tasks where application of spelling knowledge is assessed. In all written classroom tasks - such as formal assessments in different subjects, comprehension writing and writing paragraphs for creative writing exercises - there is an element of spelling assessment.

Emotional responses to writing tasks where marks are deducted for spelling errors

In class, the boys are often asked to write a paragraph or two of creative writing about an activity they have recently experienced. For example, at the time of the interviews for this study, the whole school had recently been to the Hector Pieterson Museum in Soweto. I used this visit to create a hypothetical scenario for the boys, where I explained that their teacher had asked them to write a paragraph about their visit. In her instructions about the task, I told the boys that she would tell them that spelling counted – half a mark off for every spelling error. I then asked them how they would feel about writing that piece of work.

The reactions of all 18 boys were almost identical. Their body language was very expressive – most of the boys visibly shrunk back into their chairs. There were many loud gasps of surprise and anxiety. Johny sat back in his chair with a loud "ooofff!'. His face showed unhappiness and he folded his hands in his lap (he often used his hands to express his feelings when talking naturally). Mist's eyes went very wide when I said that spelling would count in the writing task, and he sat straight up in his chair and said he 'would feel shocked!' When I enquired why he would feel shocked, Mist replied that he is not a good speller, although he wants 'to become better', and that he would have to put in 'quite a lot of effort, because I would want to get good marks'.

The overriding emotions of all the boys were those of fearfulness, nervousness and being scared to engage with the task. There were 17 comments from the 18 boys that indicated fear, nervousness or being scared to write the paragraph. Bob said he would be 'nervous and scared' because he feared failing the task: 'maybe you might get below half and then that would be a fail'. Lloyd assumed that he would have to write the piece in class, and reported that he 'would feel nervous, because you don't have many chances' to edit and rewrite the paragraph. He added 'If you had three chances to write it up, I would think ok, that's easy, I'll get full marks'. Lloyd likes to have time to plan and edit his written work.

George also reported feeling nervous to tackle the paragraph: 'I would feel nervous, and I wouldn't feel too good, because what if the teacher said we're not allowed to use our dictionaries'? George also assumed that the paragraph would be written in class, and like Lloyd, felt he would need more time to do the task well.

Spiderman, who is an English second language user, was visibly upset by the thought of having to write a creative piece of writing where marks would be deducted for incorrect spelling. He spoke faster than he usually did, and sat at the edge of his chair as he spoke. His words tripped out of his mouth, and he often could not get them out fast enough. Spiderman expressed a range of emotions – nervousness, frustration and anger. He was nervous because he felt he would get many words wrong. He felt frustrated because 'teachers don't actually know how to spell every single word in the whole world' so why must they expect him to know all his words without being able to ask for help – especially words that are not common, such as the name of the bus they went on? When I asked him why he would feel angry about having marks taken off his work for incorrect spelling, Spiderman replied that 'when someone puts me under pressure, right, and says spelling counts, spelling counts, it makes me feel like I'm not doing well. They don't appreciate the mark that I get. They don't even appreciate what I'm doing, and they just want to see me write'. Throughout the interview, Spiderman often referred to the fact that his parents and teachers did not appreciate just how hard he tries, and just how much effort he puts into his tasks. He understood that he is in an English-speaking school, and that the expectations of the boys are high, but his feeling of not being seen or heard, or that his efforts were going unnoticed, seemed to be a great source of frustration for him. This frustration would negatively affect his motivation to attempt difficult tasks, such as learning and applying his spelling words. Spiderman does, however, have a very positive outlook on learning. He finished his comments about marks being deducted for spelling errors by saying 'I think it would be exciting to see how many right words you've spelt'.

Beckham said he 'would be mad that marks are taken off for that [spelling errors]' because 'I'd be a little bit scared that my parents might shout at me'. He was afraid of what his parents would say if he got a bad mark. He went on to add that he hoped that 'my parents understand what I'm going through, because some of the words are quite hard that I like to use. I know what they mean but then I don't know how to spell them'. Beckham seemed caught between wanting to use the bigger words so that he could impress his parents, and running the risk of

spelling them incorrectly and so losing marks. This is not a calm, happy mental place to be to for a young 9-year old. This dilemma would negatively affect Beckham's motivation to put effort into his writing task. Fear (of being shouted at by his parents, or of failing) and being nervous (about not being able to ask for the correct spelling of words he wants to use) are two emotions that are known to have a negative effect on the willingness (motivation) of a child to engage with a task.

When interviewing the group comprising Thomas, Tony, Jack and FN, I noted that all 4 boys, like Mist, registered horror in their faces as I asked them about their feelings around writing a paragraph where marks would be deducted for spelling errors. All 4 boys' eyes went wide, and their mouths dropped open. There was a momentary pause as the boys thought about their answers. Thomas, who struggles to learn and conserve his words, said he would feel 'very, very stressed' about having to write a paragraph where 'for every mis-spell, you lose half a mark'. He added: 'I would feel I must use very basic words'. I watched the boys' faces closely as I knew their facial expressions could give me subtle clues as to what the boys were feeling. Thomas immediately dropped his eyes and his head down. There was no smile on his face and his voice was very quiet as he answered. Downcast eyes and the absence of a smile are two signs people show when they feel shame. This is a big emotion for a 9-year old to experience.

Both Tony and Jack felt the same way about the words they would choose to use. Tony said: 'I must use the words that I think are very basic and simple and that I know how to spell'. He went on to explain further: 'if I had to use different words, bigger words, I'd definitely get the spelling wrong because I haven't practised them a lot'. This indicates that Tony does not have confidence in his ability to conserve the words he learns. Jack said he would 'feel like that boy that you spoke to. He didn't want to spell very big words. Because if you lose half a mark and you spell ten things wrong, you get 5 marks off. And if it (the paragraph) is out of 6 marks, you're going to lose almost all your marks'. Jack spoke very quickly here, indicating that he was agitated and anxious.

In response to my question, FN said: 'I'd use small words that are quick to write, so I won't run out of time'. FN finds the physical act of writing tiring, and this will affect how he chooses to write a paragraph. He went on to add: 'And then I could write more. And then my teacher would be proud of me, for doing a little bit extra. And also, I'd try and use words that I can sound out' – the simple words.

When he heard the question, Shaq, an English second language user, slumped back in his chair with a very loud, protracted 'Yooohhh!'. He looked very unhappy at the thought of writing a creative paragraph where he would be penalised for incorrect spelling. He said he would feel anxious and nervous: 'it would be so nerve-wracking because there's many things that you have to do, and then she (the teacher) will keep you in at break if you don't finish it. And also, yoh! I can get many things wrong. If I get many things wrong, she says I have to come back and do this' (finish the paragraph). Oliver, too, said he would be nervous to tackle this paragraph: 'I would get a lot of words wrong because I would be under pressure'.

When asked how they would feel about writing a creative paragraph in which marks would be deducted for incorrect spelling, all 18 boys expressed either fear, nervousness, being scared to engage with the task, or a combination of these emotions. These are big emotions which would negatively affect the level of motivation with which the boys would approach this task. When we are faced with something at which we feel we cannot succeed, we tend to use the simplest methods to complete the task in case we fail. We do not want to put ourselves out there and be vulnerable out of fear of bringing attention to what it is we cannot do. In this case, these young boys are fearful of losing marks and failing the task, and this emotion overrides the need to succeed, to learn, to improve, to stretch themselves or be proud of their efforts.

Emotional responses to writing tasks where no marks are deducted for spelling errors

My follow-on question for the boys was to set another hypothetical scenario for them. This time, I told the boys they would have to write another paragraph on the same topic, but this time there would be no marks taken off for incorrect spelling. I asked them how they would feel about writing that particular paragraph. Where the reactions to the scenario in which marks were deducted for spelling errors was mostly fear, anger and frustration, in this scenario the boys' reactions reflected joy, delight and confidence. The boys' faces lit up and they showed their excitement for the task by all talking at once and speaking animatedly. The comment that hit home to me what these young 9-year old boys were experiencing came from Will. He said: 'I can just write free. Whatever I want. And what I think it [the content / his idea] is'. He felt he would not be held back by the fear of failing and could simply write what he was thinking about. When Will said this, his face was calm and there was a small smile on his face.

FN, too, expressed his emotions well. He said: ‘every time my teacher says that spelling does not count, I see fireworks going off in my mind!’ When I asked FN if the fireworks were because of the feeling of excitement, he nodded his head vigorously. Shaq interrupted me with a ‘Yes! Yes!’ before I had even completed the question! He half leapt out of his chair when he heard that no marks would be taken off for incorrect spelling with ‘Yoh! I’d feel *so* happy!’

The two most prominent emotions expressed about writing a paragraph where no marks would be deducted for spelling errors were relief and happiness. Of the 27 comments relating to the emotions regarding writing a paragraph where no marks would be deducted, 7 boys expressed their relief at not having to worry about spelling. Two of these boys said they were relieved because they did not have to worry about the pressure of marks and the pressure of having to perform. The other 5 boys said they were relieved because they could now write what they really wanted to write, instead of feeling they had to choose smaller, less meaningful words simply because they could spell the words. Only Oliver said he would still be reluctant to choose the bigger words. He said: ‘I’d be so excited. I wouldn’t be nervous. I’d probably be spelling the words right, but not using big words, because I’d still get nervous over those’. But he expressed relief that spelling would not count in the final mark. The other 6 boys said they would choose the bigger, more meaningful words – the words they would normally use when speaking.

In the context of the interviews and the specific context of writing a paragraph where spelling would not count, happiness seemed closely linked to relief. Spiderman, who is an English second language user, said: ‘I’d feel happy. Very, very happy - to the moon’. Shaq, whose second language is also English, expanded on that sense of happiness. He said: ‘I would be happy - very happy! Even when the moon goes down, I’d be so happy’. Beckham, who tries very hard to win the approval of his teacher and parents, felt: ‘I’d be really happy that spelling doesn’t count because then I wouldn’t feel scared’. Bob has a very good work ethic and puts a great deal of effort into all his school tasks. He felt the task would ‘be much easier’ and he looked very relieved at the thought.

Other emotions expressed by the participants in this study were excitement, confidence and being proud to show their work to their parents. Of the comments about their feelings around writing a paragraph where spelling did not count, 3 boys mentioned being excited to tackle the task, Steve said he would ‘…feel happy and excited [about not having marks deducted]. I

wouldn't just carelessly spell words. I would still put in effort'. Both George and Johny felt that they would write more confidently if they knew spelling did not count for that paragraph. With regards to making their teachers and parents proud, Jack said: 'I'd use words that I knew the meaning of, but I don't know how to spell them. She [the teacher] will be impressed. And I would try to write a lot of big words. And then she'll be proud of me, and I'll get more marks because it's longer and it has more information'. Mist, too, felt he would be able to make his parents proud of him if he did not have to worry about spelling accurately as he could then put more effort into '…the meanings of [the words] I wrote'.

Interestingly, Spiderman, Oliver and Johny expressed suspicion over why there would be no marks taken off for inaccurate spelling, although all 3 boys said that they would be very happy to do the task, nonetheless. Spiderman was able to explain his suspicion, in that he had had an experience in his past where the teacher said there would be no marks deducted for spelling errors, but then took the marks off anyway. Spiderman was upset and angry over the teacher's actions, and he has not forgotten the experience.

Conclusion

The data reveals that the boys have a high level of metacognition regarding spelling and their ability to apply it accurately. All 18 boys appeared to be well aware of their abilities / inabilities to learn and conserve their spelling with the intention of applying it to their written work. The boys knew they did not have sufficient prior knowledge about spelling to be able to use the words they wanted to use, rather than having to choose the simpler, easier-to-spell words. The emotions around creative writing ranged between high levels of anxiety if marks were taken off for incorrect spelling, and immense relief and joy if no marks were taken off for the same task. The boys' body language when talking about these two hypothetical situations was an indication of just how strongly they felt about spelling, writing and mark allocation. The thought of having to write a paragraph where they felt the focus was on spelling caused the boys to flop back in their chairs, and their hands fell into their laps. It was observed that all 18 boys looked very sad.

It was the opposite when the boys discussed being able to 'write free' (Will). The boys chatted animatedly, they hands expressing their excitement and the boys who interviewed in the groups

all spoke at once. The phrases the boys used voiced excitement and enthusiasm. Phrases such as '…very, very happy. Like to the moon!' (Spiderman); 'Yoh! I'd feel so happy!' (Shaq); and 'I see fireworks going off in my head!' (FN). This joy and relief seemed to be an indication of just how much pressure the boys felt they were under to perform for marks. The boys want to please the significant adults in their lives. They want to use big words and they want to put effort into making their paragraph more interesting and more reflective of their individual abilities. Yet fear of failure holds them back.

CHAPTER 11 – Making sense of the data

To analyse the data collected in this study, I used the model of how classroom learning happens as put forward by Shell *et al* (2010) to guide this study. Shell and co-authors have, 'to the best of their knowledge' (Shell *et al,* 2010, preface, p v), gathered the relevant information and data regarding how classroom learning happens, and have synthesised the salient conceptual ideas from Piaget, Vygotsky, the PASS model and other education and motivation theorists into their model – the Unified Learning Model (ULM).

Using the ULM (Unified Learning Model) as a conceptual frame

The ULM, a neurobiological model of how learning happens, is explained in detail in Chapter 3, but for ease of understanding, I will summarise the key elements of the model here.

The model acknowledges that no new learning takes place without attention (b). This is consistent with Piaget's and Vygotsky's theories of learning. The model identifies three main *concepts* in the learning process: 3 *principles* of learning and 5 *rules* of learning.

The figure on the following page illustrates these main concepts of the learning process and how they are connected, as proposed by Shell *et al* (2010) in their Unified Learning Model.

The 3 concepts:

1. Working memory: the mental space into which all elements needed to complete the task are brought. Working memory has 3 main functions: to recognise the information, retrieve any links (Piaget's schema) connected to that information and to provide the space to manipulate all the elements until, for example, the problem is solved, or a product, has been produced. The product could be as diverse as the correct form of a word or a solution to a problem. Although difficulties with working memory impact hugely on how learning happens, working memory has been well researched in recent years (e.g. Baddeley; Gathercole; Alloway), and is not a focus of this study.

2. Prior knowledge: refers to all knowledge that is linked or attached to that piece of information. The ULM works with 2 different kinds of knowledge – episodic (life experiences) and semantic (school knowledge). Prior knowledge plays a major role in

how new learning happens, but, again, is not a focus in this study either. (Refer to Chapter 3).

3. Motivation (or affect): the regulator of behaviour, or the energy to act (Piaget). Motivation is the driving force behind how the student's efforts are initiated, directed and sustained.

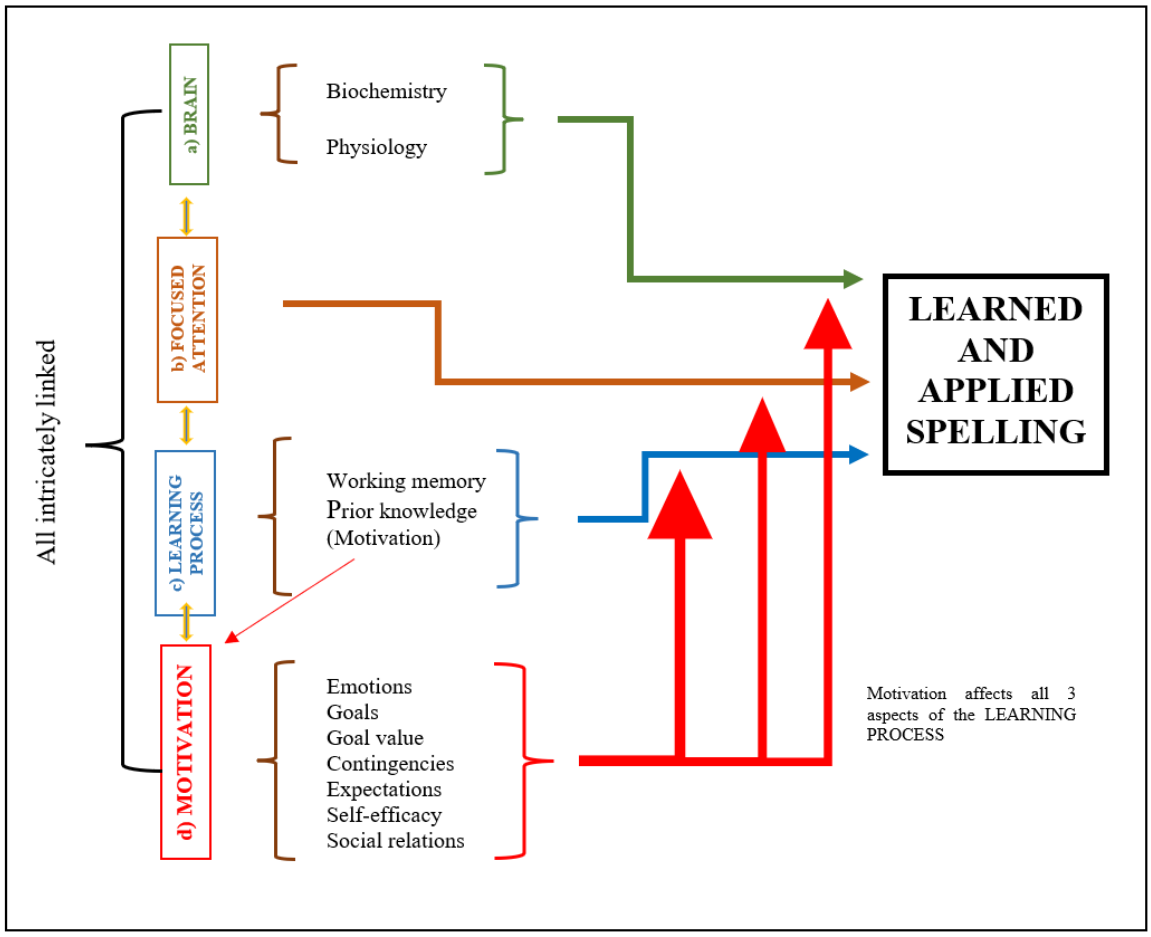


Figure 15 - How motivation influences attention and the learning process

Figure 13 summarises the concepts involved in describing the process of learning to spell and to apply the spelling words. Although motivation forms the third concept of the learning process (c) in the ULM model, I have separated it out in this diagram to highlight its role in the process of learning and applying spelling.

The 3 principles of learning (Chapter 3):

1. Learning is a product of working memory.
2. Working memory's *capacity for allocation* (how much information working memory can hold to complete a task) is affected by prior knowledge.
3. Working memory *allocation* (how much working memory is available for use during the task) is affected by motivation.

The 5 rules of learning:

1. New learning requires attention
2. Learning requires repetition
3. Learning is about connections
4. Some learning is effortless; some requires effort
5. Learning is learning

It must be noted that all 3 concepts of the learning process (c) - working memory, knowledge and motivation - are intricately linked, and that no learning can begin without focused attention to the task. I will refer back to these 3 concepts, 3 principles and 5 rules throughout this chapter.

The data collected in this study falls squarely into the motivation section of the conceptual framework, and constitutes the focal area of this study. I understand that all 4 concepts – attention, working memory, prior knowledge and motivation - are intricately linked and cannot be disconnected from each other. I also understand that biological disorders[8] of the brain such as ADD, and physiological impairments to learning such as a slow processing speed, have a significantly negative effect on a boy's ability to pay attention to his task, and so affect the way in which he can or cannot learn new material. Of the 18 boys in the study, only 4 boys have been diagnosed with ADD, and 3 of these 4 boys are on medication to help their distractibility. Two boys have been diagnosed with dyslexia (DSM 4 terminology, but used in their respective physcho-educational reports), which means they find it difficult to match the sounds of the letters with the symbols the sounds represent, and to recall this information at a speed which would make reading fluent. However, not all the boys have had a clinical diagnosis of either a biological or physiological impairment, so it would be hard to gauge whether their difficulties

[8] Although some boys in this group have been diagnosed with either a biological or a physiological impairment, the effect of these impairments on learning to spell and the ability to apply learned spelling are not within the scope of this study. Where applicable, the impairment is mentioned, and its effect noted.

with spelling are due to a biological or physiological impairment or not. Any diagnosed impairment affecting a boy will be referred to, and its effects on the boy's ability to learn and recall their spelling noted, as and when it pertains to that boy.

I will group the evidence so that it illustrates 4 claims:

Claim 1: The boys revealed high levels of anxiety around spelling, in all of its aspects, for varying reasons, resulting in a reduction of working memory's capacity and allocation to the task. This means that effective learning, on a biological level, was not happening. (Refer to Chapter 8).

Claim 2: Low self-efficacy in spelling resulted in a poor self-image as a speller, which affected the way the boys identified as an academic. (Refer to Chapters 8 and 0)

Claim 3: The conflict between a lack of interest in learning to spell accurately and the learning environments in which the boys find themselves, has an effect on the value system of the boys regarding spelling. (Refer to Chapter 9)

Claim 4: The boys' conscious choice of words when completing writing tasks in class is heavily influenced by their anxiety, low self-efficacy with regards to spelling, poor identities as writers and the low value they place on spelling. (Refer to Chapter 10)

Claim 1: The boys revealed high levels of anxiety around spelling, in all of its aspects, for varying reasons, resulting in a reduction of working memory's capacity and allocation to the task. This meant that effective learning, on a biological level, was not happening.

According to the ULM, motivation can be broken down into 4 different kinds of motivators. These are: the biological drives (such as hunger, thirst); emotions; cognitive motivators (such as self-efficacy and goal setting); and interest.

I acknowledge the negative effects of hunger and thirst on the ability to learn, but these biological drives are met and do not form a negative influence on the ability to learn with this group of boys.

The boys exhibited high levels of emotions throughout the interviews, through their words and their body language. The strongest emotion shown was reported anxiety.

Emotions

Emotions are '…rooted in biological systems associated with pleasure, pain and arousal' (Shell *et al*, 2021, p76). For the boys in this study, this means that any learning experience with regards to spelling will be influenced by how they feel about learning their words, and consequently being able to apply that knowledge to written tasks. Overall, these boys could find very little pleasure in learning their words, for varying reasons, and found spelling a very difficult skill to master. In general, the boys felt that they had to put in a great deal of effort for little reward (such as good marks in a spelling test or a written task).

Anxiety

The predominant reaction from all the boys to questions of learning to spell and having to apply their knowledge of the words was that of anxiety. Other big emotions that emerged were frustration and a sense of unfairness during test situations, an unwillingness to use words that they could not spell in written tasks for fear of failure, and a fear of how parents and teachers would react to that perceived failure. The boys revealed unexpectedly high levels of anxiety around spelling.

From the data collected, it was found that the boys found it hard to learn and conserve their English spelling words, which resulted in anxiety that they were not performing well in this area of classroom learning. According to the ULM, the conservation of information, such as the correct form of a word, requires strong neurological pathways connecting all necessary information. Although the boys could get good marks in their weekly spelling tests, they did not seem to be able to consolidate and retain their weekly spelling words sufficiently well to remember them from week to week, or from term to term. As a result, when doing classroom writing tasks, the boys consciously chose to use words that were easier to spell, but perhaps did not have the richness of complexity and meaning as the words they would normally use in their speech. This meant that the boys did not have a rich bank of words on which to draw when writing. This problem presented itself as a disconnect between learned and applied spelling. This disconnect seemed to have many and varied sources, but all involved a level of anxiety.

a) The first source of anxiety: English spelling is difficult

In written English, cracking the sound-symbol relationship code is difficult. Learning to spell in general is not something children – especially young children such as the 9-year old boys in

this study – can experiment with and, through experimentation, construct their own knowledge. Piaget does not believe that the ability to spell can develop organically, as language does, for example. He argues that spelling is a 'partial ability' that requires an 'exterior contribution' (such as explicit tuition and practise) in order to develop (Furth, 1969, p 210). That explicit tuition is difficult to achieve because the English language, as we know it today, has a history of absorbing words and spellings from the languages of its many historical conquerors, such as the Romans, Danes and Normans. The absorption of words from different languages has resulted in different ways of spelling the same sound, especially where the vowels are concerned. For example, the long 'a' sound can be spelt: 'a_e' as in 'came'; 'ey' as in 'they'; 'ai' as in 'raid'; 'ay' as in 'stay'. This makes English spelling particularly difficult to learn and remember.

Understanding the process of learning to spell through Vygotsky's Zone of Proximal Development (ZPD), where it is understood that learning is scaffolded and the student builds on his knowledge, is also difficult. The *skill* of breaking words down into their phonemic parts can be taught, and the child can learn to apply this skill to most words. Yet, as with Piaget's theory that knowledge is constructed, the conceptual problem in Vygotsky's scaffolding method comes when the same sound is spelled in different ways. The ZPDis intricately linked to the boy's prior knowledge, and if the knowledge of the sound-symbol combinations is not consolidated, there is little chance that the child is able to predict which spelling of the sound is correct. For example, having to choose how to spell the word 'they'. It could be spelled 'they', 'thay', 'thai', thei' or even 'theigh' (as in the word 'sleigh'). These vowel combinations need to be explicitly taught in order for the child to build their knowledge of spelling. There is nothing in their schemes of knowledge, when first introduced to this vowel combination, that will tell them that the vowels 'e' and 'a', when put together in that order, will say the long 'e' sound. There is a general rule that states: 'when two vowels go walking (when they are put together in a word), the first one does the talking (the sound will have the *name* of the first vowel)'. This means that when 'e' and 'a' are put together in a word such as in 'read', the vowel sound is the long 'e' sound – the name of the first letter. There are, however, exceptions to this rule. The past tense of 'to read' is 'read'. The vowel pair now says the short 'e' sound (as in 'red') – the actual *sound* the first letter makes on its own. There are no lexical clues regarding which spelling would apply to each word that sounds the same.

There are, however, graphotactic patterns (or rules governing spelling) which the child can be taught in order to choose between the different spellings of the same sound (Zhang & Treiman, 2020). These patterns are the spelling rules that are taught alongside the spelling words, such as the rule mentioned in the previous paragraph, and they reflect legal combinations of letters in the English language. Unless they are specifically taught, there is very little chance that the child will be able to build on their knowledge of the rule of 'when two vowels go walking…' as there are so many different variations on how to spell the same sounds. The child first has to understand the meaning of the word, which involves prior knowledge of grammar and an understanding of the deeper meanings of the language, what role the word plays in the construction of the sentence (could it be a noun or a verb), and then try to remember which spelling rules apply. Many sounds and their spellings need to be learned by rote. It is difficult to scaffold a child to an understanding of English spelling and the sounds in the words by using the method of the ZPD when there is no pattern to constitute a scaffold.

When a child first learns to spell in English[9], the sound-symbol combinations are straightforward. A particular sound correlates with a particular symbol. The sounds and symbols are introduced systematically, and the child builds up their knowledge base of the sound-symbol relationships. Using these letters, words can then be built up or broken down into their phonemic parts. For example, 'cat' can be broken down into its phonemic sounds 'c', 'a' and 't' – c_a_t. The child can then apply this knowledge to new words, such as 'hat', 'pat', 'bat' and 'mat'. The short 'a' sound stays constant in these words, and the child is able to consolidate their knowledge of words and spelling. Piaget's research demonstrated how for children, knowledge schema (networks of information) are created when new information is dealt with by holding it up against their pre-existing schema of knowledge (Furth, 1969). For example, each new word containing the short 'a' sound confirms the sound-symbol relationship, which helps the child absorb this information into their schema of knowledge (assimilation). The boys in this study remembered being excited about first learning the sound-symbol combinations in Grades 0 - 2. They found it easy and had fun while they were learning. For example, Mist, who now struggles with learning to spell in Grade 4, said he 'was fine' with learning and applying his spelling in the earlier grades.

[9] The pros and cons of different spelling programmes are not within the scope of this research study.

Levine (1998) describes spelling as '...an intriguing model of decision making' (p386). This decision-making requires working memory to constantly pattern-match the words to prior knowledge (Shell *et al*, 2010, p 22) (see Figure 14). The problem for both Mist and Beckham, and most of the boys in this study, arose when new sound-symbol combinations were introduced that had the same sound but a different spelling for an already-known sound-symbol combination. For example, Mist and Beckham learned early on in Grade 0 that 'a' corresponds to the short sound as in 'hat'. Then, in Grade 3, they learned that the 'a' in 'about' is pronounced as the short 'u' sound as in 'hut', and that the 'a' in the word 'also' is pronounced as 'aw' as in 'saw'. In the word 'game', the 'a', because it is followed by a consonant ('m') and ends with an 'e', is pronounced as a long 'a' as in 'hay'. Now, in Grade 4, they are required to apply a range of spelling rules to the new words they need to learn, for example, the rule that when adding the suffix '-ing' to the word 'game', the 'e' at the end of the word needs to be dropped before the '-ing' is added to make the word 'gaming'. Neither Mist nor Beckham may have been ready for such challenges to their knowledge schema when new spelling rules for familiar sounds were introduced in Grades 2 and 3, and may not have been able to accommodate this information into their knowledge of spelling. The result is that the state of equilibration (Furth, 1969) for Mist and his peers - a state of balance or conservation of the new sound-symbol combinations - was not reached.

Yet, the format of the new spelling programme in Grade 4 seemed to assume that these basics were in place. By giving only 4 days (the rule and words were introduced on a Monday, and the test was on a Friday of the same week) to learn and use the spelling rule and accompanying words, the spelling programme the boys were following progressed at a rate that did not allow Mist and Beckham the time to practise, and so conserve, their spelling words. Because it was so hard to remember the new combinations of letters and sounds, both Mist and Beckham appeared to not be able to remember these new sound-symbol correlations and so tended to refer back to their knowledge of the original sound-symbol relationships they had already learned and consolidated. As a result, these two boys, and many of the boys in this study, seemed to become phonetic spellers – they continued using the basic sound-symbol combinations they had learned at the start of their reading journey. The variations of English spelling become too difficult and complicated to remember, making it increasingly effortful for the young, emergent reader / speller to learn the spelling and conserve it to long term memory.

The effort needed to make constant decisions about which vowel pairing is the correct one for each word becomes overwhelming. For example, Mist felt that spelling got progressively harder in Grades 3 and 4. He also found the volume of work increased – he was expected to write longer sentences, more of them and to use longer, more complex words. Mist's energy was now directed at the number and form of the sentences, as this caused him greater anxiety than learning to spell correctly, and he no longer focussed on the different ways the same-sounding words could be spelled according to their meaning. He was not able to provide even *more* energy to assimilate and accommodate the words he needed to learn. As a result, he does not have a rich bank of correctly spelled words on which to draw when doing any form of classroom writing (prior knowledge). Mist's situation reflects Principle 2 in the ULM, which states that working memory's capacity to hold all the elements of a task in mind is affected by prior knowledge. In other words, Mist seems to be using up most of his working memory capacity focusing on how to structure the sentences, and to make the sentences long enough. He does not appear to have enough of that mental working space to also bring in his knowledge of the spelling of the words he wants to use. It follows, then, that if Mist has not consolidated the correct form of the words he needs through practise, he will not have automatic access to the information he needs, and will spend mental time and effort trying source it.

For these boys, the knowledge that they are not producing work of which they can be proud, together with the fear of failure, seems to generate high levels of anxiety around any writing where spelling counts for marks.

b) The second source of anxiety: learning to spell correctly requires a great deal of effort

Emotions such as anxiety negatively affect the boys' behaviour towards learning their spelling. Piaget suggests that affect (emotions and motivation) is a function of intelligence and that the disequilibrium between assimilation (absorbing new knowledge) and accommodation (making changes to and accepting those changes to knowledge) on an *affective* (emotional) level is what provides the energy needed for action or behaviour. Affect '…serves as the regulator of action' (Piaget, 1981, preface p xi). In other words, what the child *feels* about learning their spelling words will dictate how much energy and effort they are willing to put into learning and conserving the spelling words. The data indicates that the boys in this study do not like to learn their weekly words, and find it difficult to find the energy with which to learn the words.

Intellectually, the energy (affect) required to absorb the new sound-symbol connection (cognition) and then to add that new sound-symbol connection to the existing schema of spelling words, is too high. For Mist, it requires too much effort, and he therefore tends to avoid the spelling tasks. Mist demonstrates this avoidance by not prioritising spelling homework in the week and by only learning his words for the purpose of writing a spelling test. Even then, Mist admitted to not remembering the words he had learned from one week to the next. If any other form of classroom writing was required where marks would be deducted for spelling errors, Mist opted for the safer, simpler, more easy-to-spell words. This choice did not reflect his range of vocabulary, nor his potential as a writer. His choice reflected his lack of self-confidence as a speller, and his fear of failure if too many marks were taken off for incorrect spelling. Mist was not the only participant who reacted to the inability to conserve words and their correct forms in this way. Tony also felt he worked hard to learn for the spelling tests, but he was very aware that he did not learn in order to remember the words – he learned for the test only. He said that sometimes he could not remember the words the next day. GG said he felt he was a good speller, but admitted he often could not remember the words from the term before. All the boys in this study knew they did not write to their potential for fear of having marks deducted from their writing, and all the boys said they would certainly opt for the easier, simpler words when writing.

Figure 15 below illustrates how the boys' feelings described in the paragraphs above fit into a learning experience that involves learning weekly spelling words. According to Piaget, avoidance of the task (such as leaving learning the weekly words to the last minute, or not prioritising spelling homework in the week) and having low expectations and goals for the spelling tests and classroom writing tasks, form part of the motivation (or lack of motivation) that takes place in a learning activity.

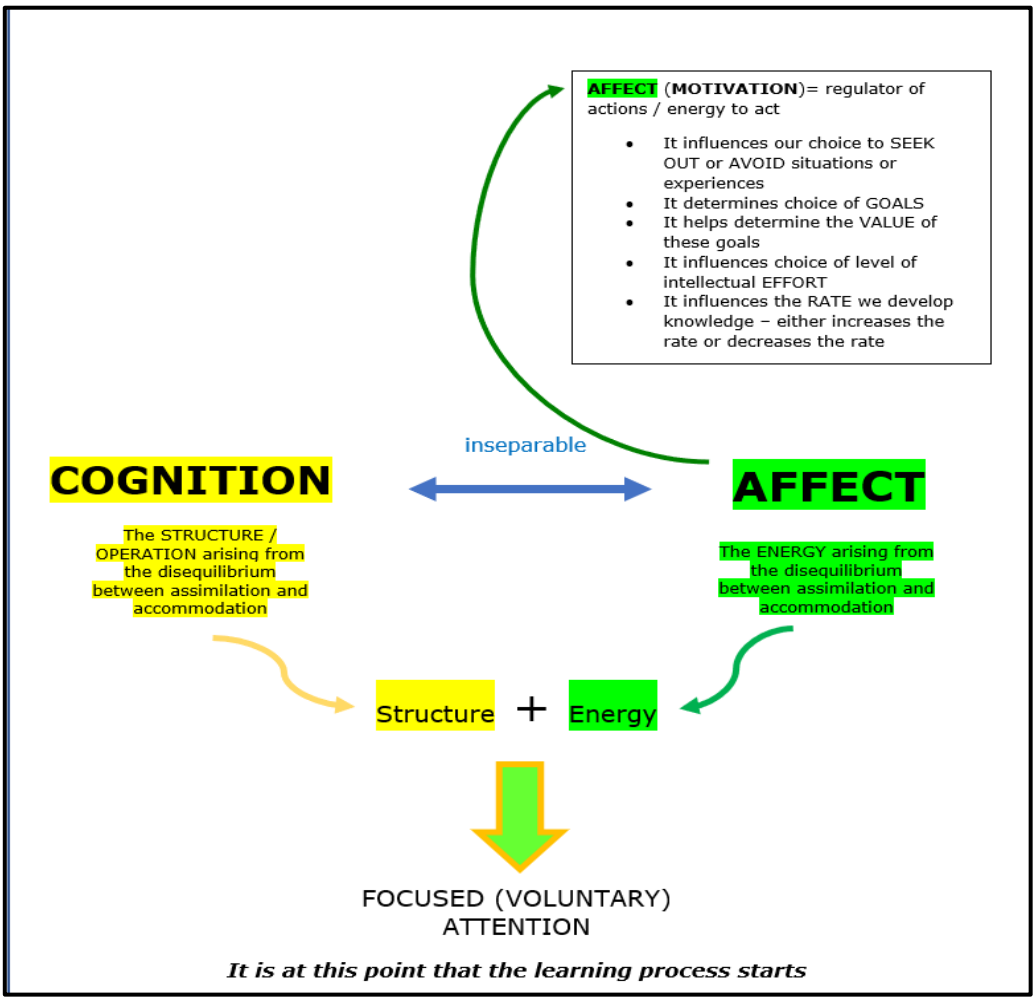


Figure 16 - The relationship between learning spelling words and the effort this activity requires as suggested by Piaget's theory

Piaget suggests that the energy required to learn something comes from the difference between what the boy knows and the new information he encounters relating to the same subject. Although there are many things that can affect this energy, the most important one in the case of these boys finding learning to spell so difficult, is that the effort required to learn and apply a new sound-symbol combination requires too much intellectual (cognitive) effort. As a result, the affect (or motivation) to act, or to change their behaviour towards learning their spelling, is negatively affected, and the boys find it difficult to pay focused attention to the task.

Shell *et al* state that 'There is evidence that emotional inputs [such as anxiety] occupy slots in working memory's temporary storage, so emotion can compete for storage space with other sensory input or retrieved knowledge' (Shell *et al,* 2010, p 76). For these young boys, this means that high levels of anxiety will take up a lot of space in working memory, and leave less

space to retrieve and manipulate knowledge, and to strengthen the neural pathways for learning the correct form of a word. Levine (2003) observes that '…spelling may be thought of as a conspicuous indicator of your intellectual worth. Put simply, kids who can't spell feel terrible.' The feeling of having to put too much effort into an activity where expectations of success were low, and of not being confident to achieve the goals they would like to, resulted in the boys not putting effort into thinking about *how* they could make learning to spell a more productive task – their negative feelings around spelling adversely affected their actions and behaviour towards learning their words.

Nearly all the boys said they used only the method of 'look, cover, write, check' to learn their words. It was a comfortable strategy, and one that required the least amount of effort as far as using their imaginations or creativity went. Only 3 boys said they used a spelling app on a device to help them learn their words, but went on to admit that, although they could be fun, the apps were not always a useful tool. Two boys said they used physical action, such as jumping on a trampoline or kicking a soccer ball, to help them spell out their words, but later added that they did not do this all the time. Not knowing which strategy could best suit their way of learning their spelling words in order to conserve the words to memory, together with the low expectations of success and the high levels of effort required to learn spelling words, meant that the boys experienced a decreased rate of learning and conserving spelling words. Which, in turn, lead to feelings of anxiety, further compounding the anxiety already felt around spelling.

Learning and conserving their spelling words does not appear to be happening effectively for the boys in this study. Cognitively, they already know they are unable to conserve the words they learn. The boys admit to only learning the words the night before the spelling test; they acknowledge that they cannot remember the spelling words from one week to the next, or from the preceding terms; they admit to consciously choosing the easier-to-spell words when doing classroom writing; they understand they do not make visible their true thoughts around the piece of writing, or the richness of their spoken vocabulary for fear of spelling words incorrectly, thus end up losing marks; and the boys know they need to put more effort into learning their words each week, but they have other pressures, such as learning for an assessment, that take precedence. This knowledge about their abilities and inabilities around spelling creates high levels of anxiety, which then affects their motivation (affect) to learn the words in the first place. Constantly low levels of motivation is not conducive to summoning

up the energy required to find ways in which to learn the words, or even to change their mind-sets and behaviour towards spelling. It simply requires too much energy to learn and conserve these words for future use. As a result, effective learning of how to spell words does not happen.

The inability to conserve their words, for whatever reason or reasons, resulted in high levels of anxiety among the boys. This anxiety is pervasive, and affects many other areas of their beliefs about themselves as learners and academics.

c) The third source of anxiety: low prioritising of spelling practice

There were different factors that seemed to contribute to the boys' lack of prioritising their spelling words.

To begin with, there was not enough time in the week to prioritise an activity, such as learning spelling words, where the perceived chances of success were small. Most of the boys in this study did not prioritise spelling practice in the week. Not only did the boys feel anxious about spelling in all of its areas, but they also felt overwhelmed by the effort required to learn the weekly words. On the very basic level of simply learning and remembering English spelling words, the boys found that the effort required to assimilate and accommodate the various forms of spelling for the same sound in different words, and to adapt their knowledge schema so that they could draw on their banks of correctly spelled words, was too much. The boys found that they were putting effort into learning their spelling words, but not experiencing consistent success either in their spelling tests nor in their examples of classroom writing. Many boys admitted to learning their words only the night before the test.

The introduction of formal assessments in Grade 4 brought new pressures and anxieties. All the boys in the study admitted to feeling extremely anxious about formal assessments, and therefore made learning for these tests a priority in their week. FN even questioned why the teachers gave them spelling to learn in the weeks of their assessments. Most of the boys admitted to spending more time revising for the assessment, which was on a Wednesday, and only looked at their spelling words on a Thursday, the day before the spelling test. So, not only were the boys not wanting to put time and effort into learning their weekly spelling words because they simply found it too hard to do, but the added pressure of, and anxiety around, the assessments made them prioritise their spelling even less. In turn, they knew they did not learn their spelling well, which then added to the anxiety around the weekly spelling tests.

All 18 boys in this study complained of being overwhelmed by too little time for all their work, and too much homework given each week. In Grade 4, homework for the week is given on a Monday, and the boys are able to fit in the tasks as best as they can according to their afternoon activities. The boys all felt, however, that there was too little time in the week to fit in all their academic demands, their sport, other extra murals such as music, and to do the homework tasks well. FN went as far as to suggest not having spelling homework in the weeks where they had to write formal subject assessments. It appeared to me that it was a choice between anxieties – anxiety over learning for an assessment overruled the anxiety of learning for the spelling test. This meant that learning for the assessments ranked higher in the boys' priorities than did learning their spelling.

The anxiety generated by not prioritising their spelling learning and, instead, giving preference to learning for their Wednesday assessments, is compounded by the anxiety generated by knowing they go into a test situation not fully comfortable with their spelling knowledge.

d) The fourth source of anxiety: the discrepancy between the need to please the adults in the boys' lives, and the inability to do so with regards to spelling

In this particular phase of their lives, these 8- and 9-year old boys' cognitive and emotional development is characterised by the development of the problem of will (using experience to decide on whether to persevere or not) (Piaget, 1981, p 65). The will influences aspects of the child's thinking and actions such as the interpersonal relationship he has with the significant adults in his life, and his feelings towards what he feels he should do (trying to please his teacher, for example).

This problem of will became a source of anxiety for these boys as they felt pressure to succeed for, and from, the significant adults in their lives (see Chapter 8, fifth source of anxiety). These adults could be their parents, other family members or their teachers. This group of 8- and 9-year-old boys felt a strong need to please these adults – a strong sense of duty (Piaget, 1981, p 65) towards parents and teachers. Tony voiced his appreciation towards his parents for sending him to this school, and admitted he wanted to do his best because his parents were paying high school fees for him. This added burden increased Tony's anxiety around spelling tests and classroom writing where marks were involved. Spiderman felt this need to please keenly,

especially towards his mother. He, too, understood the privilege afforded him being at this school, and wanted to be able to show his parents just how hard he was working. Yet he felt that his mother did not understand just how hard he *was* working, as his marks did not reflect this. This need for recognition of his efforts generated high levels of anxiety in Spiderman – in fact, the need for acceptance and recognition made many of the boys in the study anxious. Lloyd, Tony and Jack all wanted to make their parents proud of them by getting good marks for a piece of writing. They wanted to impress their parents by using complicated words and good vocabulary in the paragraph / article. During the interview, when discussing the topic of using the bigger words in his writing, Mist's face glowed when he thought about his teacher saying 'well done' to him on his use of big words. Pleasing the significant adults in their lives was very important to these boys.

An achievable goal will help sustain working memory allocation for a longer period of time (Shell *et al*, 2010, p71). A goal that is high in value will help sustain focused attention, and therefore sustain working memory allocation for the task of learning to spell. Some of the boys said that their parents set them goals for their spelling tests, such as GG's mother telling him that 70% for his spelling test was something he should reach, and if he did, he could have pizza as a reward. The problem arises when the goal set does not concur with the boy's belief that he can actually achieve 70% for the test. GG admitted that he did not often reach that goal. Goals are highly subjective, and a parent's goal often does not match the boy's goal. Being aware of not being able to reach their parents' goals seemed to add more pressure and created more anxiety for the boys, as, on the one hand they want the reward, but on the other hand the goal is not within their reach. This perceived failure to live up to their parents' expectations seemed to consolidate the boys' feelings around spelling, spelling tests and classroom writing, thus contributing to their overall negative beliefs about their spelling abilities.

Both Steve and Panther expressed great anxiety over being asked by their parents what marks they think they will get for each weekly spelling test. This meant they are even more anxious about writing the test. Shaq and Spiderman both reported that they did not want to disappoint their respective mothers, yet they did - almost every week. Spiderman experienced great anxiety because he felt his mother did not understand how hard he was trying. Shaq felt anxious because he felt his mother would shout at him, and make him work and practise even harder whenever he got poor marks for a test.

With regards to wanting to please the adults in their lives around classroom writing, every boy in the study admitted to consciously choosing the more simple, easy-to-spell words if marks were to be taken off for incorrect spelling. This generated another source of anxiety for the boys, as all of them wanted to show the teacher (and their parents) that they could use big, complex, hard-to-spell words, but their anxiety over failing the task due to poor spelling was too great. Added to this was the unhappiness the boys felt in not being able to make their thinking visible, and to be able to show their potential as a writer – after all, they use the words in their speeches and while talking. In a talk about dyslexia (a physiological impairment that affects reading and spelling) in 2018 (before the DSM 5 came into effect), Gottwald said: 'spelling is a funnel through which they [the children] feed their thoughts'. With poor spelling skills, or the inability to conserve and then apply their spelling, these boys risk losing their creative thoughts through fear and anxiety, and end up producing an inferior quality piece of writing.

e) The fifth source of anxiety: poor self-efficacy with regards to spelling

'Self-efficacy is the belief we have in our own abilities, specifically our ability to meet the challenges ahead of us and complete a task successfully' (Akhtar, 2008, as sited by Ackerman, 2020). Self-efficacy is a concept that deals with the belief that we *can* achieve a goal, with an understanding of *how* we can achieve it. For example, the boys knew that they *wanted* to get good marks for their spelling tests, and they knew (in theory) what it would take to achieve that goal, but not all the boys were confident that they would. Will admitted to not always learning his words each week. He said: 'Sometimes I feel confident, sometimes I totally feel like I don't want to do this [write the test] because I've barely learnt the words'. All 18 boys had a low self-efficacy when it came to spelling – either in a test situation, or when engaged in different kinds of classroom writing.

According to the ULM, 'self-efficacy motivates our attention to procedures we are likely to perform successfully' (Shell *et al*, 2010, p75). The boys in this study, on the whole, felt that getting good marks for their spelling tests or for written tasks, was not within their grasp. For example, on the Monday when the words were given out, Thomas would look over the words and feel that he would not succeed in the Friday test – even *before* he had started practising the words. His self-efficacy was very low. Mist, because he felt he did not have the confidence to spell the words correctly most of the time, had a poor self-efficacy when it came to writing

paragraphs where he knew spelling counted. He admitted to consciously choosing the easy-to-spell words over the richer, more complex words he uses in speech - words he would have *liked* to use in his writing - because of a fear of failing the task. Mist articulated what all 18 boys in this study admitted to feeling. I think Will summed it up best: when he was asked how he would feel if the writing task did *not* include mark deductions for spelling, he said 'I can just write free. Like, whatever I want. And what(ever) I think of'. These young boys were experiencing a great deal of pressure when asked to write a passage where marks would be taken off for incorrect spelling.

If a child thinks they can, and they can do it successfully, they will apply their focus and try. If not, they will be very reluctant to try. In essence, self-efficacy is the record (a knowledge chunk) we store of all the times we have tried something, what was done and how effective it was. During this concrete stage of intellectual and affective development (ages 9 to 11 years old) (Piaget, 1981, p 65), the child begins to remember feelings attached to certain situations, such as spelling tests or writing tasks, and will bring these feelings to the task at hand. They will be able to weigh up the consequences of low or high marks for an assignment, and then decide on a course of action. If the child has low self-efficacy, they will not want to put effort into something in which they have no confidence of succeeding. Moo seems to have reached this point of giving up on spelling. He already understands that his spelling marks count for very little in the overall year mark.

Self-efficacy is linked to other chunks or procedural chains, just as any other kind of knowledge. Shell *et al* (2010) believe that the motivation from this extremely personal knowledge chunk is stronger than that from our expectancies. In the classroom situation, the ULM states that self-efficacy is more easily "...undermine[d] than instilled" (p 75). This is a critical thing to understand from a teacher's point of view. For example, self-efficacy can be undermined by comparing ourselves to others, or if we perceive that others can do it better than we can. Shell *et al* state that: 'Suggesting that we won't be successful can lower our self-efficacy' (Shell *et al*, 2010, p75). Thomas seems to have experienced this. He said that when he receives the new spelling words on a Monday, he looks over them and already feels that he will not be successful in the test on the Friday. When the sense of self-efficacy is low, there may not be enough energy to put into a task as would normally be the case.

The conflict between wanting to get good marks for a task and the belief that they could not achieve this goal created high levels of anxiety around classroom writing with these boys (see Chapter 8, section 8.4: *Emotions around spelling test marks*). My concern lies in the possibility that the boys may continue to experience failure in spelling, and these feelings will be cemented in their subconscious and will affect future self-beliefs.

A short recap

Up until this point, anxiety around finding English spelling difficult and having to put in too much effort in order to learn and apply spelling was reportedly high. The boys did not prioritise learning their spelling. These boys had low self-efficacy when it came to spelling tests and classroom writing. It was the same poor self-belief in their abilities and their low expectations of spelling success that I had encountered when I taught the boys. The anxiety generated by parents' and teachers' expectations, and the pressure to succeed seemed to be ever-present. After all, the boys are in a highly academic environment. Yet, the data revealed higher *levels* of anxiety amongst the boys. It was much higher in terms of what I would have expected from the hypotheses that have informed this study (see Chapters 2 and 4). These 8- and 9-year old boys were experiencing a high level of anxiety around a relatively small part of their academic curriculum. Yet, as the data revealed, the boys displayed remarkable metacognition in recognising why they did not put enough effort into learning their spelling: because they did not have time; they found it too difficult; they were very aware of, and sensitive to, the reactions of their teachers and parents; and they truly believed that they would not see success in spelling tests and writing tasks (see Chapter 10, p 199). The collective anxiety from all these different sources had become too much. Most of the boys had resigned themselves to the fact that they would not be good spellers, and, by implication, would not be good writers. Moo had already given up on both activities. Yet, during the interview, verbally, he was able to articulate his feelings and thoughts very well.

Both Piaget and Vygotsky argue that development in thinking and learning is intricately linked to the affective (emotional) development of the child. By implication, spelling may be considered an emotionally-driven activity, and the most prominent emotion displayed by the boys in this study is that of anxiety. There was, however, one more source of anxiety that the data revealed.

f) The sixth source of anxiety: changes in the spelling programme and the test format from Grade 3 to Grade 4

The data revealed that the changes in the spelling programme and the new test formats generated a great deal of anxiety for the boys in this study. This was something new I had not previously understood. In addition to this, the intensity of that anxiety was a new phenomenon for me (refer to Chapter 8). Although the interviews occurred 6 – 8 months into the school year, this group of boys was still finding the spelling programme and test formats difficult. Apart from their reactions to questions about writing a paragraph where marks were deducted, or not, for each spelling error, the responses to their feelings around the spelling programme and test formats elicited the strongest emotions from the boys.

The effects of anxiety in the test situation can be extended to any situation where a child feels anxious. The boys in this study were experiencing anxiety from many different sources:

- Their lack of ability to learn new sound-symbol combinations for sounds they already knew
- The experience, which cemented itself into a firm belief, that they could not conserve their words from one week to the next, or from term to term
- Their understanding that they were not able to work to their full potential, and be proud of their work, because they were too afraid to use complex words in their writing for fear of losing marks
- Their anxiety about needing to put great effort into learning the spelling words when they did not see the value of correct spelling
- Being overwhelmed by lack of time to learn their words properly due to too much homework, lack of previous success and the need to learn for other assessments, such as the formal assessments
- Having low self-efficacy around spelling, and the anxiety created by the conflict between wanting good marks, but believing they could not achieve those marks
- Wanting to please the significant adults in their lives, but knowing it requires too much effort, too much time and believing they cannot do it anyway
- Additional anxiety generated by the new spelling programme and the new test formats

Summary

Piaget suggests that biological and cognitive stages of development are 'fuelled' by a corresponding affective (emotion / motivation) development. Cognition and affect are different in nature but cannot be dissociated from each other (Piaget, 1981, p 5). They do not necessarily develop at the same time, nor does the affective development follow a necessary sequence of stages, as does cognitive development. Figure 11.2 (p 11) shows that motivation has a significant impact on the boys' learning experiences. As a motivator, anxiety affects the ability to pay focused attention to the learning situation. Lack of focused attention affects the ability to access prior knowledge (Principle 1; Rule 1). This, in turn, affects working memory's ability to function at its full potential. Anxiety also negatively affects working memory's functioning directly by reducing the allocation of working memory to the task, which in turn, affects how well the information is stored, remembered and retrieved (Principles 1, 2 and 3). Lack of easily-accessible prior knowledge causes its own anxiety which adds to the anxiety already being experienced. Not being able to easily recall the correct form of a word he wants to use, makes the boy have to work harder to assimilate and accommodate the new knowledge. As a result, very little quality learning takes place in that situation (Principle 1; Rule 1). In the next learning situation (such as the next spelling lesson), during which the teachers might assume that effective learning has already taken place, these boys are starting from a point of disadvantage – they do not have a solid foundation of spelling knowledge. Their negative emotions around spelling appear to be linked, on a neurobiological level, with the ability to spell. The more failure they experience with spelling, the more those pathways are strengthened, and the more the boys identify with being a poor speller.

Anxiety is a powerful emotion and negatively effects working memory's capacity to retrieve and hold the information, as well as negatively effecting working memory's ability to strengthen the neural pathways of learning.

Claim 2: Low self-efficacy in spelling resulted in a poor self-image as a speller, which affected the boys' identity as an academic

Before I continue, I would like to draw distinctions between the terms 'identity', 'self-image', 'self-esteem' and 'self-efficacy'.

I will use the term 'identity' when referring to the boys' whole picture of *who* they believe they are. Forming a part of that identity is the 'self-image' – what *kind* of person the boys see themselves as, or how they value themselves. When I use the term 'self-esteem', I am referring to the boys' *confidence* in their own abilities. Lastly, when I write about how the boys feel about their abilities to *perform* that task, I am referring to their 'self-efficacy'.

The boys in this study are now at an age when they can control where they apply their attention and efforts by using the language, words and behaviours they have learned so far, through their social and cultural contexts, to decide what is important and what can be ignored (Vygotsky, 1978, p 35). They are able to use their prior knowledge and experiences to prioritise their tasks. At the ages of 8- and 9-years old, these young boys are also starting to develop a self-image of their academic selves by comparing their achievements to their peers (Piaget, 1981). They are also using their thoughts, experiences and personal language to create their beliefs about themselves and their abilities (Vygotsky, 1978). In Piaget's terms, they are becoming less egocentric, and, through their social comparisons, are beginning to describe themselves according to their personality traits ('I am funny"; I am friendly') and their cognitive abilities ('I am good at Maths; 'I am not a good reader'). For example, both Mist and Will have concluded that they are not good spellers. Mist seemed quite resigned when he admitted to '…not being that good at spelling'. Will relies on other people to check his work, and believes good spellers are born with the ability to spell well. He has a fixed mindset (Dweck, 2012) towards spelling, and does not believe he can improve, even with practise. All 18 boys understood the theory behind being a good speller - the need for practise, that the practise needs time, that it requires effort and perseverance - but none of the boys felt they had the ability to improve. Some of the boys felt they were good at spelling because they could achieve 10 out of 10 for the single word test, but when it came to the dictation or creative writing, none of the boys associated with being a good, confident speller.

Factors contributing to low self-efficacy

For knowledge to be created, the child has to 'make it his own' through repeated practise and mediation (Vygotsky, 1978, p 46). The ULM concurs with this thought as it argues that the neurobiological pathways in the brain need to be used and reused in order to strengthen them to enable the knowledge chunk to be retrieved when needed, such as in the case of spelling tests, or any kind of classroom writing. The stronger the pathways, the more automatically the

words can be retrieved, and the more space is available in working memory to focus on other aspects of the task. From the data collected, it appears that there are four main factors that seemed to have had a great influence on how the boys had developed their self-esteem and their identities as a speller and academic: time, effort, perseverance and enough opportunities to use the weekly spelling words meaningfully.

Factor 1: the lack of time to practise, process and conserve the spelling words

Time plays a crucial part in the boys being able to learn and reflect on the new sound-symbol combination, or even simply to make connections to their existing knowledge (Donaldson, 1979, p 94). Time enough to learn and practise the weekly spelling words was a big issue for the boys in this study. They felt overwhelmed by the amount of homework given each week, and had the added pressure of having to learn for their assessments. Grade 4, the grade the boys were in at the time of the interviews, is where the boys encounter formal assessments for the first time. All 18 boys expressed high levels of anxiety around these assessments as they understood that the marks for these assessments impacted on their final year mark. A source of great fear came from the possibility that they may fail Grade 4 if their assessment marks were not good enough. Although most of the boys reported that they practised their spelling words between Monday (when the words were introduced) and Friday (the day of the spelling test), the general consensus was that most of their effort was applied to learning their spelling the day before the spelling test, or even on the way to school on the Friday, because they were trying to learn for the formal assessment during that week.

A few of the boys felt they could benefit from having more time to learn the weekly lists of words. For example, both Thomas and Jack said they would like 2 weeks to learn a list of words. Mist, who also has difficulties with processing information quickly, felt he would cope better with learning his words if he could have more time. FN proposed that no spelling homework should be given in the weeks of the formal assessments, simply to allow more time to learn for what he feels is important.

Enough time to practise, process and practise retrieval of the spelling words is critical for laying down and strengthening the neural pathways in the brain. The stronger the neural pathways, the easier it is to access the correct form of the word. When neural pathways fire together, it forms knowledge chunks. So, the more the boys practise with different strategies, the bigger the knowledge chunk becomes, and the greater the numbers of ways the chunk can be fired up

when retrieving the word. For example, the correct form of the word can be found by using its meaning, its link to different meanings (such as 'jam' can be linked to a traffic jam; a jamming session; strawberry jam; being in a jam) or to the way in which the word was practised. The quicker the boy is able to find the right spelling of the word, the more attention he can give to formulating sentences, or developing his thoughts. The more focused attention he is able to give the task, the larger the capacity of working memory becomes with which to lay down the neural pathways.

Factor 2: learning to spell requires great effort

All 18 boys found spelling difficult for many different reasons. They found it hard to learn the words, hard to conserve the words for the tests, and even harder to retrieve the correct form of the words they learn so that they can draw on these words when engaging with writing of any kind. Through repeated failure and only the occasional successes in the weekly spelling tests, these boys have identified themselves as poor spellers. They did not find the practise provided by the spelling programme relevant or interesting, so found it hard to engage with their spelling learning meaningfully. Tony, along with all the other boys, admitted to only learning his spelling words for the test, and not for retention - his intention to learn the words was short term, and not for the long term storage of knowledge.

Learning with the intent to gain knowledge is the goal of any formal or classroom learning experience (Shell et al, 2010). Most of the boys said they practised hard to learn for their spelling tests. However, the practise did not seem to be paying off, as the boys were unable to retain the correct form of the words learned. The strategies they used were not conducive to strengthening the neural pathways in the brain. It seems that their intention was aimed only at getting good marks for their spelling test, and not to be able to retain the words long term. Their strategies of matching and retrieving words in order to strengthen the neurobiological pathways did not seem to be conducive to retaining the spelling knowledge.

Everything connected to learning to spell involved great effort for these boys. As a result, spelling became less of a priority in their week than learning for assessments or completing other homework set for them. This meant that less time was available to learn effectively.

Factor 3: lack of perseverance in spelling tasks

Perseverance in a task is linked to contingencies and expectancies. Contingencies reflect the experienced relationship between knowledge, behaviour (or actions) and outcome (Shell *et al*, 2010, p71). Expectations are based on past experiences (contingencies), and they influence the behaviours or actions towards a task when engaging in a similar task. If a strategy, or action, has worked before, it is likely to be used again. Contrary to this, however, is that it is possible to repeat a behaviour simply because it is easy and familiar (least effort required), which means that optimal learning does not happen.

'Contingencies underlie our episodic memories' - our life experiences (*ibid* p71). The more times the boys experience something, such as repeated failures in a spelling test or with a piece of writing, the more they believe it will happen again. At the time of the interviews, all the boys were experiencing repeated failure in their application of their spelling words. Although most of the boys reported that they did well when tested on an isolated word, all the boys struggled to apply their words accurately. The boys admitted to learning their spelling words for the weekly test only, and reported that they could often not remember the previous week's words and found it hard to remember words from the lists of the previous terms. What they were doing helped to get them through the test situation, and that seemed to be enough, even though their poor marks were a major source of anxiety to the boys. With a history of minimal success in spelling tests, Thomas said he would look at the words at the start of the week, and expect to fail the test before he had even started learning the new list of words. His accumulated knowledge chunks around spelling and lack of success (contingencies) led to this belief.

According to the ULM, Rule 1 of learning states that learning requires repetition, but the boys were finding it too hard to repeat their practice, as their strategies did not bring positive results. The boys understood that their learning methods did not promote success, and they also understood that the strategies did not really help them engage with their learning. Their test results and the errors made in their writing tasks illustrate this. Yet, the boys seemed not to feel the need to search for other strategies that may help. Although all the boys in the study were in academic support for their spelling in Grade 3, they admitted to not remembering any of the strategies taught during that time. The only strategy they consistently used was the 'look, cover, write, check' strategy as it is the one strategy most often reinforced by their class teachers.

Too much effort and energy was required to lay down the initial pathways for learning the correct form of the word. As a result, matching the form of the word to prior knowledge and

retrieving their knowledge in order to apply it to tasks such as creative writing tasks, was even more of an effort. Too much working memory capacity was used up in searching for the correct form of the word, and too little capacity was then available for making any further meaningful connections. The boys simply could not find the motivation to persevere with finding different ways to learn their spelling in the face of repeated failures in their spelling tests and written tasks. They used the strategy that required the least amount of effort (learning for the test only). As a result, they could not make the connections to the sound-symbol combinations necessary to lay down strong, interlinked pathways.

Rule 4 of learning states that 'some learning is effortless, some requires effort' (Shell et al, 2010). All the boys felt that spelling required too much effort, so they did not want to persevere with a behaviour that did not produce consistent success.

Factor 4: lack of meaningful opportunities to practise spelling

For optimal learning to happen, the opportunities for meaningful practice (Rule 2 of learning) need: time enough for practise; tasks and activities that are related to the weekly spelling words; and activities that are meaningful and relevant to the boys (Donaldson, 1979, p 100). Donaldson goes on to say that tasks must: be age- and level-appropriate; have a novel enough level of interest; and need to have a balance of what the boys know, and what they do not yet know (*ibid*, p 100). The opportunities available for the boys in this study to practise their spelling words came from whatever practise the boys did for homework, the activities in their AIS books, and the Monday morning spelling lesson where the rule and words for the week were introduced. They had additional opportunities to practise during 4 English language and comprehension lessons of 45 minutes each, in class, during the week, and incidental learning opportunities where the teacher would point out the weekly words whenever they appeared in other lessons, such as History or Geography.

The 2 main sources of opportunities to engage with, and practise, their spelling words with focused attention, came from their time spent on spelling while doing homework, and the tasks for the week in the AIS workbook. The boys did not, however, feel that they had enough time in the week to pay close attention to learning their words. As mentioned above (Factor 3: perseverance), the boys were using strategies that required the least amount of effort to learn their words. The boys reported feeling overwhelmed with homework, sport and extramural activities, and the pressure of having to study for assessments. With regards to the AIS

programme, the boys found very little worthy of piquing their interest in learning to spell the weekly words correctly. The boys did not find the activities in the AIS programme interesting, and in some cases, even relevant. For example, Beckham pointed out that in one week of activities in the AIS book, there was a section where the boys had to recall how to spell the names of the different numbers – an activity that was not related to the rule, the 15 words associated to the rule or even the 5 sight words. This not only confused him, but he felt it was completely out of context.

The tasks in the AIS programme were, formally speaking, *ag*e-appropriate for these boys, but not necessarily *ability*-appropriate (Donaldson, 1979). The middling to stronger spellers in the class were able to cope well enough with the tasks and activities in the AIS book, but the boys in this study were not – hence the emphasis on ability. Many of the boys felt they did not have enough time to learn the words and rules because of their busy week. They also felt that the programme went too fast for them – they did not have enough time to learn the words and rules, process them (lay down the relevant neural pathways) and make strong connections to other pathways so that they could be easily retrieved when needed. Some boys even suggested that it would be beneficial to them to be able to learn the words over 2 weeks. The boys knew they did not have the knowledge of spelling words that they should have, and so were not only able to accurately apply this kind of knowledge to their spelling in writing tasks or spelling tests, but they were reluctant to use the bigger words for fear of getting them wrong. As a result, the boys were not able to create and strengthen the pathways and links within their knowledge base to conserve the words and rules. Retrieval of knowledge was always an effort, and it took time to try and remember which rule applied to the words in question. Time taken to search for poorly-linked knowledge interrupted the functioning of working memory, and the task became more difficult.

Summary

According to the ULM, all neural pathways of knowledge chunks associated with a learning experience fire together, making the networks wider and stronger. Emotions, such as anxiety or those emotions associated with self-efficacy, self-esteem and self-image are stored as knowledge chunks (Shell *et al*, 2010, p78), and therefore are also subjected to the same 3 principles and the 5 rules of learning. If the motivation to learn (in the forms of low self-efficacy, low self-esteem and a poor self-image as a speller) is reduced, it will be very hard to put effort into learning and applying spelling knowledge. As a result, very little learning will

happen, and knowledge cannot be built up effectively. In new learning experiences, the boy does not have access to well-connected knowledge, and cannot complete tasks as competently as he would want to.

'Your identity emerges out of your habits' (Clear, 2018, p36). When applying this insight to the case of the boys in this study, their lack of practice with regards to learning and applying their spelling words is the collection of habits, strategies, and attitudes they use to learn their words. This, together with the pervasive anxiety they felt around spelling, led to the boys identifying with being poor spellers. By association, the boys all felt that they were no good at writing either, as the words they wanted to use were too difficult to remember.

Through repeated experiences of failure (contingencies), together with the expectations of further failures (expectations), the boys in this study developed the belief that they did not have the ability to perform well in many of their written tasks (self-efficacy). As a result, the boys believed that they were, and always would be, poor spellers. The boys understood that spelling is an integral part of all other subjects, such as History and Geography. Their self-efficacy in these subjects was also low because of the demand of using correctly spelled academic language associated with them, in spite of the fact that most of the boys enjoyed learning the facts in these subjects. Their poor self-image of themselves as a speller meant they did not feel they could engage with written tasks in any subject with confidence. This reflected directly on how they saw themselves as being 'clever' or 'smart' or being able to achieve higher marks in their written tasks, leading them to believe that they are not academics.

Claim 3: The conflict between a lack of interest in learning to spell accurately and the learning environments in which the boys find themselves, has an effect on the value system of the boys regarding spelling

Having an interest in something helps motivate you to take positive, intentional action to engage fully with mastering the skills needed to achieve a goal related to a task or activity. How you *value* those skills, or the goal you want to achieve, will direct your *behaviour* towards mastering those skills or achieving that goal (Shell *et al*, 2010, p80). If you are interested in what you are doing, and can understand the value of the skills, the more motivated you will be to put in the effort to achieving mastery. What the data revealed (see Chapter 9) was that there

were conflicting influences on the boys' value systems with regards to spelling. On the one hand, the boys found spelling very difficult for multiple reasons, which lowered their interest in learning to spell. The boys' practice of learning their spelling (the actions, or *behaviours* taken to do so) indicated that the boys did not put a great deal of effort into learning to spell with the *intent* to conserve the words. Most of the boys admitted to learning their words simply for the weekly test. On the other hand, the boys felt that the systemic expectations (from the school and the home environments) showed them that accurate spelling was important. Both environments demonstrated this by expecting good marks in the tests and the classroom writing tasks.

Spelling was not an interesting activity in which to invest time and effort

Although there is not sufficient research with regards to fully understanding the biological and cognitive structure of interest (*ibid* p79), the ULM considers interest to have a 'knowledge-like' component. We can remember when we have enjoyed doing something, or have achieved a goal that made us feel happy or good or proud. In contrast, we can also remember when an activity made us feel disappointed, bored, confused and anxious. These memories will be triggered again whenever we do similar activities. For these boys, spelling seems to have become associated with effort, minimal success and feelings of anxiety resulting from many different sources. It is difficult to maintain a personal interest in an activity, such as learning to spell words, when it requires so much effort for very little return in success.

The ULM separates interest into two kinds of interest - personal interest and situational interest. Systemic learning is the kind of learning the school and home environments expect the boys to achieve. Systemic learning includes the behaviours (or strategies) the boys need to learn, as well as the expectations of the boys to perform to a certain standard by allocating marks to different outcomes (such as spelling tests) or products the boys need to complete (such as a piece of writing). It is the discrepancy between the two facets of interest in and the systemic teaching and learning of spelling that has contributed towards the boys placing a low value on being able to spell accurately.

Personal interest in spelling

Two sources affecting personal attention emerged from the data. The first source was that the boys did not find spelling was a skill that they wanted to invest it – they did not want to learn

and practise their spelling words with the aim of improving their spelling skills. Secondly, the boys found the spelling programme irrelevant and sometimes confusing, and so did not fully engage with the activities.

'Personal interest directs attention' (*ibid* p 80), which is a key element in the learning experience (Rule 1 – new learning requires attention). The more we practise something with intent and interest, the better we get at it, the more our self-efficacy will increase, and the stronger our expectations for future success in the task becomes. This means that we will have more confidence to try something we are unfamiliar with if we have experienced repeated success with similar or related tasks in the past. Success breeds success. On the other hand, the reverse could also become reality. The boys in this study showed very little personal interest in the programme, and very little personal interest in developing their own spelling skills. Within the model of learning that the ULM proposes, the boys begin a spelling task with reduced attention which, in turn, negatively affects how working memory is able to function.

The 8- and 9-year old boys in this study unanimously agreed that learning to spell in Grade 4 was not an interesting activity (see Chapter 9, *The appeal of the spelling tasks*). Although Lloyd loved to play with the words by finding interesting meanings and connections, and understanding that many words had root words, he found the act of learning to spell difficult. Verbally, Lloyd was strong, as were most of the boys in the group. The boys did not, however, find much to hold their attention in the AIS spelling programme activities, nor did they find their own practice of learning their words very interesting. Spelling was homework – something that had to be done each week. Rather than seeing it as an activity that could help them improve their vocabularies and help them become confident writers, it was a chore. The lack of intentional practise of their words resulted in poor conservation of the correct form of the words, which, in turn, led to poor results in spelling tests and writing tasks (see Chapter 9).

Personal interest in a task is also informed by emotional motivators such as: a boy's self-efficacy with regards to spelling – does he feel he can perform the tasks; his self-image – how he sees and values himself as a speller; and his self-esteem – how confident he feels about spelling. As discussed in claims 1 and 2 above, these boys believed that they would seldom succeed in getting high marks in a spelling test, and they did not expect themselves to produce a piece of writing with (mostly) accurate spelling. With these low expectations, it is

understandable that they boys showed little personal interest in learning to spell and apply the words to written tasks.

Personal interest helps sustain the motivation needed to achieve a long-term goal (*ibid* p80). All the boys in the study agreed that the ability to spell accurately was a skill everyone needed – especially as an adult. The boys also agreed that the words they were learning to spell in Grade 4 formed the foundation of spelling words in Grades 6 and 7, and then on into high school. They did not, however, connect this long term goal with their weekly spelling tests or classroom writing. It was hard for these boys to believe that if they put more effort, or different effort (as in trying new strategies to learn their words), into learning their words one week, that they would succeed in the weeks to come. All that the boys could see was how hard it was *right now*. Moo had, in fact, given up on putting effort into learning and applying his words as he already understood that 'someone' (a teacher or the intern teacher) would correct his errors. Moo had almost no personal interest in spelling.

All 18 boys agreed that the element of fun was missing from their weekly practice. Beckham remembers the fun games he played with the weekly words in Grade 3. He commented that it helped him remember a lot of the words. But now, in Grade 4, there was not enough time in the week to try out new strategies - there was barely enough time to do the minimum amount of work required as far as learning their words for homework was concerned. Secondly, opportunities to practise the weekly words in class were confined to one 45-minute lesson, and some practise and incidental learning during the other English lessons (4 of them) during the week. Thirdly, none of the boys particularly enjoyed the activities in the AIS spelling programme. Beckham found some of the weekly tasks confusing, as the weekly practise may include remembering how to spell the names of numbers, which had nothing to do with the spelling rule of the week, nor the words to be learned. Finally, the levels of anxiety experienced by the boys relating to knowing they did not have enough time to practise, that they knew they could not remember words from previous weeks or terms, unrealistic expectations from parents and teachers as far as tests and written work was concerned and the fact that they wanted to please the adults in their lives but kept falling short, did not make any part of learning to spell enjoyable.

In Chapter 9, the data revealed that the strategies the boys used at home to learn their weekly words were not proving to be effective. With a low interest in learning to spell, the boys did

not want to put effort into finding new, novel or fun ways with which to learn their words. The strategy most used in class (look, cover, write, check) was the one the boys used most. Thomas sometimes used shaving cream to write in, FN sometimes used bath crayons to practise writing his words on the wall while he showered. But the boys did not use these strategies consistently. There were not enough moments of success, nor did they have enough vested interest in developing the ability to spell well.

The boys in this study found very little that appealed to their personal interest in learning to spell. When asked, all the boys knew what it took to become a good speller (having an innate skill, practise, using the right strategies), but only a few of the boys actually admitted to putting their knowledge of the theory into their own practice. Although they could see the value of being able to spell accurately in theory, it was for their future selves, and not something they valued highly enough to change their strategies of learning, or as a skill worth developing.

Situational interest

Situational interest has its sources from input in the environment in which we find ourselves (Shell *et al*, 2010*,* p 79). For these boys, the sources of the input included peers who sat in the same group, general classroom noise, posters on the classroom walls, the teacher's voice and, at the time of the interviews, noises from the building operations directly outside the boys' classrooms. All these sources served as possible distractions from the task at hand – learning or practising spelling words. For the 5 boys who had been diagnosed with an attention deficit disorder, these distractions made learning even more difficult.

Novelty in the environment can also pique situational interest, for example, the novelty of a new game, or a new way of introducing the new words for the week. While familiarity with a routine for learning something new (such as a new list of words) can give comfort and ease of mind, it can also become less and less interesting if repeated too many times. By bringing in a novel way of learning spelling words, it is possible to reignite the interest in learning to spell those words. Yet the spelling programme, designed with novelty in mind (through different activities each week), was not interesting enough to capture the attention of the boys in this study.

Interest directs attention (the first step in learning something new) and working memory allocation (including the ability to recognise new input, link the input to prior knowledge and

to retrieve the correct information) (*ibid,* p79). According to the ULM, personal interest 'relates to what it is we do' (*ibid).* With little personal interest in learning to spell, together with a possibly distracting environment in the classroom, all 18 boys in this study were not motivated to put much effort into their spelling activities – they simply did not want to do it.

The systematic learning environments

The academic system in which the boys found themselves was twofold – the school environment and the home environment. The data revealed 2 different sources from these environments that negatively affected the boys' decisions that spelling as a skill worth developing: the lack of time in their days to practice spelling with the intent to retain the words; and the effects of goal-setting on the interest levels of the boys.

a) The lack of time in the school and home settings

The school environment requires that they practise spelling every day (for homework and in class), write a spelling test on a Friday morning, and the system requires that the boys demonstrate their ability to apply their spelling in various written tasks (such as dictation, writing descriptive or narrative paragraphs, answering written questions). The system wants the boys to be proficient spellers and demonstrates this expectation by testing the boys' knowledge of individual words (as in the Friday test) and recording marks for the tests, as well as requiring the boys to complete written tasks (such as a creative writing paragraph) with accurate spelling. In some of these written tasks, marks are deducted for spelling errors.

The school system expected the boys to play sport 3 days a week with the possibility of additional matches or galas on Wednesday or Friday afternoons respectively. Some boys had out-of-school activities such as club soccer (Shaq) or gymnastics practise (Oliver). Others had to attend music lessons in the afternoon. In addition to this, the academic structure required the Grade 4 boys to revise for formal assessments for the first time in their school careers. Although the assessments did not occur every week, the boys felt the pressure to perform very keenly.

The systematic demands on their time and their abilities to fit everything into their week left the boys feeling overwhelmed (refer to Chapter 8, *Lack of time due to work overload*). Thomas, FN, Spiderman, Tony and Panther reported needing more time to learn their spelling words effectively. FN wanted more time to learn for his formal assessments, and suggested not having to learn spelling words in the weeks of the assessments. Through the spelling tests and the

written tasks (the required *behaviours*), the boys understood that the school valued accurate spelling, yet the boys' comments revealed that they felt unable to meet the school's expectations.

The boys' home environments reflected the school environment's lack of time for the boys to truly engage with the weekly words with the intention of practising the words (learning the correct spelling), practising retrieving the words (allowing working memory to strengthen the neural links in the brain) and practising to write the words in order to apply them in context. Time to complete homework and learn for tests and assessments competed with sport and the many, varied activities the boys were engaged in outside of the school environment. Beckham needed to attend religious instruction every afternoon, and found it extremely difficult to fit in all his homework, including practising his spelling. Bob attended outside gymnastic sessions every day, and found that the pressure to fit everything into his day made him feel anxious.

With so little time to complete homework, the boys in this study needed to prioritise their efforts. More effort seemed to end up going towards learning for assessments than it did going towards spelling, as the boys felt that failing an assessment was worse than failing a spelling test. Their personal interest was directed towards getting good marks in the assessment. The assessments were still novel as they had not encountered formal assessments until Grade 4. As a result, at the time of the interviews, the boys did not have any previous experience that would influence how they approached the task of learning for the assessment, and had not formed any expectations regarding their success in the situation. In contrast, spelling tests were done every week, and the boys had all experienced minimal success in these tests. The boys had already developed the sense that they were not good spellers, which resulted in the boys having less interest in learning for the spelling tests than in learning for the assessments.

b) Systematic goal-setting

Both parents and teachers offered rewards as motivation to achieve certain marks (goals). Lloyd earned himself a device from his mother after consistently achieving his weekly goals; GG and Bob could earn pizza. The teachers offered rewards such as chocolate and stickers should the boys achieve a certain goal (mark). Tony reported that he had once earned chocolate for being in the top 3 spellers in the class for a particular test where the words were given in isolation. The boys could also earn stickers to put on a chart if they achieved a certain percentage in their tests. A certain number of stickers would earn the boys a reward.

According to the ULM, goals, just like interest, dictate how much attention is allocated to a task, and therefore will influence how much working memory will be allocated to learning (Shell *et al*, 2010, p 69). If we have a goal in learning, we have a purpose to learn. Shell and co-authors claim that goals are, in fact, '…integral to all controlled processing in working memory' – goals '…drive processing' (*ibid*). Tony felt that the reward of a chocolate was worth putting a great deal of effort into learning his weekly words for that week. FN liked the thought of earning stickers for the chart. Lloyd, GG and Bob all felt the rewards they were offered were worth the effort it would take to achieve the mark. The problem with this situation is that the *reward* becomes the goal, rather than the goal being to develop an interest in the ability to spell accurately. All the boy wanted to earn the chocolate. Many of the boys admitted to practising the words the day before the spelling test, and sometimes only on the morning of the test, on the way to school. The intent here was to simply learn enough to get through the test, and perhaps to earn the reward. In fact, all 18 boys admitted to forgetting most of their spelling words a week later. If the goal is not to intentionally learn a word in order to be able to retrieve it in the future (*wanting* to be able to spell accurately), the connections and links to the word and other related knowledge will not be strengthened sufficiently for the word to be effectively learned.

The data revealed that both the school and the home environments put emphasis on the *results* the boys needed to achieve and did not seem to emphasise the *value* of being able to spell accurately. The boys seemed to have received the message from both the school and their home environments that accurate spelling was valued for what it gets you (marks) and not what accurate spelling empowers you to do (the ability to write with accuracy and confidence).

The boys wanted to succeed in their environments. They wanted to please their teachers and parents (see above Claim 1: *The fourth source of anxiety*) and they wanted to 'feel proud' of their work (Mist and Jack). But they knew that they were not achieving what they perceived that they should be. The constant effort needed to learn and conserve their spelling, for all the different reasons already discussed, resulted in the boys demonstrating little interest in learning to spell accurately. In addition to this, the boys found it very difficult to keep up with the demands from the school and home environments (the systematic learning) of having to learn and apply their spelling. The effort to keep up academically, and the need to please the

significant adults in their lives was one of the sources of great anxiety for these boys (refer to Chapter 8, *The fifth source of anxiety*).

The conflict between a lack of interest in learning to spell, and the desire to succeed in the home and school learning environments has affected how the boys view, and value, the ability to spell accurately.

At the beginning of the interviews, some of the boys reported that they did feel that spelling was important. The boys understood that accurate spelling was needed for assignments and assessments in all school subjects (cross-curricular activities), and not only in spelling tests (see Chapter 9, p 161). The boys could see the value of spelling in activities such as reading, in communicating, in getting better marks for spelling tests and writing assignments, and in the future, when they would be looking for jobs or helping their own children with homework. Yet the boys' practice did not reflect these values. They understood the value of spelling in theory, but struggled to apply this knowledge to their practice in Grade 4.

With the exception of FN, who felt unsure of how his family felt about being able to spell accurately, all the boys acknowledged that they believed their families took spelling seriously. Their parents showed this in different ways. For example, Thomas's parents understood he had difficulties with learning to spell accurately and helped him make practise fun. Tony, Bob and Panther had watched their respective parents deal with their older siblings with regards to spelling, and had understood that their parents placed value in the ability to spell well. Mist seemed to have a different experience around spelling at home. Mist felt that, although his mom helped him with his homework, neither parent understood just how hard it was for him to learn to spell accurately as they were both good spellers. Spiderman knew his mom could not spell in English (his is a Xhosa-speaking family), yet she placed pressure on him to get good marks for spelling tests and creative writing tasks. This left Spiderman feeling unsupported and angry about having to achieve these marks. Steve's parents want him to '…be the best I can be [academically]'. Oliver's mother told him that '…when you read, you have to know the words and you have to know what they mean'.

In spite of knowing that their parents valued the ability to spell accurately, the boys still could not motivate themselves enough to be able to develop an interest in spelling accurately. The whole process of learning and conserving the spelling words was too difficult. Most of the boys

already saw themselves as poor spellers, and had no confidence that they could improve. The conflict between their lack of interest in spelling accurately and the knowledge that their parents valued the skill of being able to spell accurately, appeared to be a great source of anxiety for the boys as they wanted to make their parents proud of them.

The boys found themselves in a similar situation in the school environment. All 18 boys agreed that the school (and their teachers) placed great value in the ability to spell accurately. The indicators of these values included: the school was '… a school. You have to learn' (Oliver); the school showed that spelling was important by '…giving you tests and assessments on spelling…' (Spiderman); Shaq felt the school favoured and rewarded those boys who could spell well. Even though the boys wanted to perform well in class, they did not seem to be able find the energy (motivation) to change their behaviours with regards to their spelling practice.

Referring back to the paragraph at the beginning of Claim 3, it is the value that you find in a task that drives your behaviours or actions towards achieving your goal or mastering the skill. The boys seemed to find that learning to spell accurately was not something they saw as being worthwhile, for all the many reasons already discussed. Nor were the boys able to change the learning systems in which they found themselves, yet the boys wanted to succeed in these environments. It seemed that some of the boys had already given up on their spelling and had given up trying to live up to the expectations of his 2 environments. He admitted that he did not really put much effort into learning his spelling words, and that he did not worry about spelling marks as '… these marks don't make a big difference at the end of the year for our [year] marks'.

Claim 4: The boys' conscious choice of words when completing writing tasks in class is heavily influenced by their anxiety, low self-efficacy with regards to spelling, poor identities as writers and the low value they have placed on spelling as a result

As discussed in Claim 1, anxiety from many different sources affected the boys' abilities to commit to memory the correct form of many of their sound-symbol connections, as well as the correct forms of the words they were required to learn. Without a sound knowledge base of the sound-symbol connections, the boys were not able to accurately encode (spell) the words using

their prior knowledge. According to the ULM, anxiety, which constitutes an emotive motivator, reduces working memory allocation to the task (Principle 3 of learning). In the absence of knowledge with which to pattern-match, working memory is unable to create effective networks of knowledge that can be called upon in future tasks and easily accessed. The ULM states this in its second Principle – working memory's capacity for allocation is affected by prior knowledge. The boys in this study do not seem have a good knowledge base from which to work when learning their spelling. They admit to learning their words for the test only, and that they do not remember many of their words from one week to the next, or those words they learned the month or term before. The boys' abilities to learn and accurately recall their spelling words seemed to be negatively affected by both anxiety and the lack of consolidated knowledge of spelling.

Claim 2 discussed how the boys' self-efficacy - their belief that they *can* perform a task successfully, such as getting good marks in a spelling test, or being able to use the bigger, richer words when writing – affected their self-esteem (or confidence) with regards to being able to spell accurately. Low self-efficacy, together with low self-esteem, resulted in a poor self-image (how they valued themselves as spellers). The boys' appeared to have identified themselves as someone who cannot spell. It follows then, that the boys believed that, because they were poor spellers, they could not write well. This led the boys to identify with not being 'smart' or 'clever'.

Claim 3 discussed how the boys did not value spelling as a skill worthy of persevering with and developing. Spelling was a skill that was too difficult and would require too much energy to master. All 18 boys experienced anxiety around not being able to live up to parents' and teachers' expectations as far as being a competent speller was concerned. On a neurobiological level, these emotional 'knowledge chunks' (Shell *et al*, 2010, p78), fire in unison with the knowledge chunks already laid down around spelling and become part of that network. This meant that any task where accurate spelling is involved, including written tasks, would be linked to other networks of knowledge regarding spelling. The more the boys experience failure (perceived or real), the stronger the negative emotions associated with spelling in any situation becomes.

Together with boys' responses to the questions about test writing and the spelling programme, the responses to the questions about writing tasks elicited the strongest emotions and reactions

from the boys. On the one hand, all 18 boys seemed visibly upset during the interviews when I gave them the hypothetical scenario of having to write paragraph where marks would be deducted for incorrect spelling (see Chapter 10, p199). Their body language indicated that the thought of writing a paragraph where marks were deducted for spelling errors made them very anxious. The boys used words such as 'scared', 'nervous' and 'mad' to describe how they might feel. Thomas's feelings about the kind of task where spelling counted reflected what most of the boys felt. He said: 'I would feel I must use very basic words'.

On the other hand, the hypothetical scenario put to the boys where they were expected to write a paragraph, but no marks would be deducted for spelling errors, brought out equally strong emotions, but this time of relief and joy from the boys (see Chapter 10, p202). The kinds of words the boys used to describe how they felt about writing a paragraph where spelling errors did not count were 'excited', happy' and 'relieved'. These phrases reflected a different attitude towards being able to write a paragraph with no threat of losing marks over incorrect spelling: '… more determined'; 'I'd be so confident…'; 'it would be much easier…'; 'I want my parents to be proud of me'; 'I will at least try the word…'; 'I would still put in effort…'; 'I'll try to write lot of big words…and she'll [the teacher] be proud of me…'; and 'it [the paragraph] will have more information…'. Will expressed his utter relief at not having to worry about losing marks for spelling errors when he said: 'I can just write free. Like, whatever I want'.

The phrases listed above indicate that the boys would be interested in engaging with the task of writing should no marks be lost for spelling mistakes. The boys would put effort into their task because they would feel confidence and pride in what they were doing. It seemed as though there was no anxiety and nervousness associated with writing this kind of paragraph. Quite the opposite, in fact. The boys' seemed to believe that they would be able to perform this kind of task successfully. They felt as though they could make their teachers and parents proud. The words and phrases the boys used in this context reflected high self-efficacy, high confidence (a positive self-image), the willingness to put effort into something they would normally not like to do. The words and phrases used also reflected an understanding that the boys knew they could show their true potential as a writer (identity) by expressing their thoughts in bigger, more complex words.

Conclusion

As a framework with which to analyse the data collected from the interviews with these 8-and 9-year old boys, the ULM offers a clearer understanding, on a neurobiological level, of the role motivation plays in the boys' conscious choices of words when engaging with written tasks. The concept of motivation within the ULM includes: cognitive motivators of setting goals; the value assigned to developing a skill for personal improvement; expectations of success with tasks and a self-efficacy when it comes to performing in these tasks; emotional motivators such as anxiety, fear, fear of failure, joy, relief, confidence and pride; and interest in a task (both personal and situational).

It appears that the main demotivators for these boys are anxiety from many different sources, fear of failure, and that learning to spell accurately requires too much effort. These 3 cognitive motivators negatively affect the way in which spelling is consolidated in long term memory (prior knowledge). With a low knowledge base of words they know how to spell correctly, the boys are not confident writers, and so consciously choose the simpler, easier-to spell words, rather than the more complex words they would normally use when speaking.

CHAPTER 12 – Reflections on What was Learned

In this chapter, I will reflect on how my understanding of and appreciation for the role motivation plays in the learning process has been enhanced by this study. I will do this by way of a summary of the components of the learning process as put forward by the ULM and their interconnectedness (see fig 16 below), and will speak to this summary in my discussion. In figure 16, the conceptual frame (the Unified Learning Model) I used to help me better understand the role of motivation in learning to spell is highlighted in yellow. The focus of this study (motivation's role in learning to spell and apply words) is highlighted in blue. The concepts, principles and rules of learning as posited by the ULM are stated at the top of the diagram, in different colours, as an easy reference to the connections between the concepts. The differently coloured lines and numbers refer to the same-coloured principle or rule that directs that connection.

The biological impairments to learning are acknowledged, but are not a detailed part of this study. Of the 18 boys, 5 boys have been diagnosed with ADD or elements of slow processing speeds, and these diagnoses are referred to when applicable. Within this group of boys, there are 5 boys who are second language English speakers. In this study, difficulties experienced in learning to spell and apply words in a second language are also considered impairments, but the mechanisms of learning a second language is not within the study's scope. Where applicable, the reader's attention has been alerted to the boy's situation.

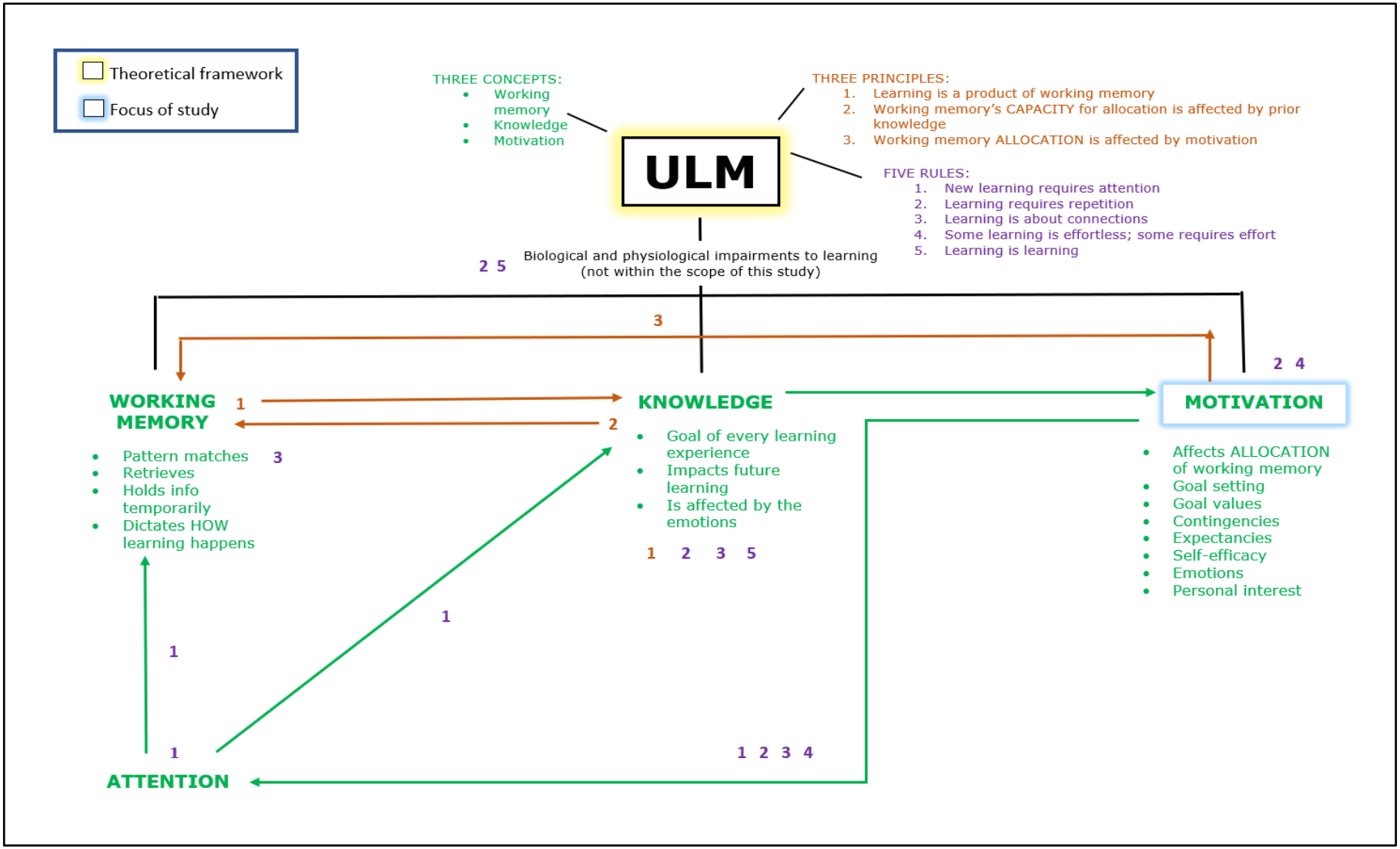


Figure 17 - A summary of the concepts involved in the classroom learning process and their interrelatedness according to the ULM

The findings in chapter 8 revealed that all 18 boys were experiencing high levels of anxiety around spelling activities. This seemed to be the predominant emotion affecting the boys' abilities to learn and conserve their spelling words. This anxiety had many different sources. The general anxiety related to test-taking has its source in the fear of failure (a strong emotion). The anxiety regarding the changes in the spelling programme resulted from the boys having to get used to a new way of learning their weekly spelling words. The boys felt that the new programme did not really help them to learn the words, and often contained activities which the boys felt were irrelevant (a lack of novelty and a lack of personal interest). Further anxiety was experienced by the boys from the pressure to succeed coming from parents and teachers. The boys revealed that this pressure often took the form of having to meet the unrealistic expectations from the adults in their lives. Although the boys wanted to please their parents and teachers, the boys did not believe they could (contingencies and expectations).

Referring to figure 17, it can be seen that emotions (for example, anxiety), personal interest (which includes novelty), contingencies and expectations all fall under motivation. The line connecting motivation and attention, and the application of Rule 1 of learning, illustrates how motivation affects the ability to pay attention to a task. Rule 1 states that all new learning requires attention, but with a low motivation to learn their spelling words resulting from too much anxiety associated with spelling, the boys' ability to pay attention to the task of learning (new sound-symbol connections, for example) is negatively affected.

Following the arrows on the diagram from attention to working memory and knowledge, it can be seen that the lack attention to new learning affects how working memory can function and how the lack of attention affects the ability to create new knowledge. Principle 3 states that learning is a product of working memory, but if the boy is unable to pay focused attention to the task, working memory is unable to function to its potential. If attention to the task is lacking, there will be less allocation of available working memory with which to pattern-match the information, to retrieve prior knowledge in order to make neural connections, and to lay down new pathways and new connections of knowledge (create knowledge). This would result in the boys being unable to grow and develop their pathways and networks of knowledge about spelling. The knowledge chunks of negative emotions, however, will be strengthened each time the boy experiences difficulties with spelling.

The boys in this study reported high levels of anxiety with respect to spelling. I had experienced similar anxiety from the boys in my own practice. The new insights I have gained from this research arise from answering the questions of why and how anxiety affects the learning process, in particular, the effects anxiety has on motivation. While I had understood from Gathercole (2011), Alloway (2011) and Henry (2012) that anxiety effectively reduces the capacity of working memory, I had not fully understood the implications of this, on knowledge-building (the link between prior knowledge and the role of motivation). Previous to this research I had focused on remediating the *behaviours* of the boys, without understanding what was happening on a neurological level. I had tried to alleviate the boys' anxiety by encouraging them to use different strategies during the spelling test. I had suggested strategies such as: writing the sound blend at the top of the page to remind them of the focus of the spelling words that week; breaking the words down into their sound chunks; and listening carefully to the dictated sentences, checking each word as the teacher read the sentence for the final time. What I had not understood at the time, and what I understand now, is that even with those strategies in place, anxiety had already reduced the allocation of available working memory with which to listen to the word, retrieve the correct form and write the word down on paper. For the boys who have impairments to learning such as ADD and slow processing speeds, or are learning to spell words in a second language, the amount of working memory available to process the instructions and produce a written word is further reduced.

Another strategy I often used was to encourage the boys I taught to set themselves a goal each week – both for the individual spelling of the words part of the test and for the dictated sentences. Should they reach that goal, the boys would receive a reward. I thought the reward might help to motivate the boys to practise harder and thus achieve better results. Although this strategy worked for some of the boys, it did not work for all the boys. I now understand that the reward had become the goal, and not the ability to learn, conserve and retrieve the accurate form of a word. The findings in Chapter 9 showed me that I should have looked more closely at how the boys valued the role of spelling, and how they valued the skill of being able to spell accurately.

The effects motivation has on the ability to conserve and retrieve spelling words

The findings in Chapter 9 revealed that the boys' abilities to conserve (add to existing knowledge) the spelling words they learned was negatively affected by many different aspects

of both their thoughts and beliefs, and their learning environments. First, the boys found learning to spell English words confusing due to the many different ways in which a vowel sound can be spelled. Secondly, the boys found that it was easier to spell individual words in a test than it was to spell those same words in a sentence. In a sentence, it requires great effort from the boys to learn, to connect to prior knowledge and to create networks of knowledge. Thirdly, the boys' lack of personal interest in developing the skill of accurate spelling for their own development did not motivate them to persevere with spelling tasks. The seemingly impossible task of reconciling the conflict between this lack of personal interest in spelling and the expectations for success from their home and school environments negatively affected the boys' value systems regarding spelling. The fourth aspect of learning the affect the abilities to conserve their spelling words came from the finding that the boys felt that learning to spell was an activity that required too much effort. Finally, the fifth aspect of learning that contributed to a lack of conservation of words in long term memory was that the boys did not place great value on spelling due to their poor knowledge base of the words. The value we place in a skill directs how much effort and what strategies we will use to master the skills. The findings in Chapter 9 revealed that the boys did not practise effectively, and so did not repeatedly fire and connect all the pathways of learning. The boys only used the strategies they felt could help them pass the weekly spelling test. All these difficulties the boys experienced meant that the boys were not able to effectively conserve their words in long term memory, and so found it difficult to retrieve the accurate form of the word when needed.

Effort, the lack of personal interest in spelling, a low value placed on spelling and the absence of the use of effective strategies, once again, fall under motivation. Referring to figure 16, the arrow connecting knowledge (such as the conservation of the correct forms of words) to motivation shows how knowledge, or the lack thereof, affects the motivation to learn. If prior knowledge of sound-symbol combinations are not available, it makes it very difficult for the boy to match new information with that which he should know. Motivation then affects the boy's ability to pay attention to the task, and the learning and conserving of the new knowledge does not happen. Following the orange line connecting motivation to working memory, it can be seen that motivation will affect how well working memory can function. Principle 3 states that working memory allocation is affected by motivation. This means that motivation will direct how much available working memory will be allocated to the task of learning new words. The findings in Chapter 9 indicate that the boys in this study are not able to effectively conserve their spelling words as the lack of motivation to do so reduces working memory's abilities to

pattern-match the new words with knowledge that may not be available - it requires too much effort to search for the information needed. A low knowledge base of words means that they boys do not have the information available for working memory to retrieve what it needs, and when it needs it, so as to strengthen new pathways and create wider networks.

What the findings in Chapter 9 have shown me, is that the ability to conserve the accurate form of words is more complicated than I had previously understood. What I have come to understand is that being able to learn and remember correct spelling of words requires more than making a task novel, or different, in order to capture the boy's attention. Being able to conserve words is more than practising harder or longer or more often. Practise is critical to the learning process as it enables working memory to fire the neural pathways over and over, so that they become stronger and more widely connected. But practising requires effort on the part of the boy. And in order to expend the effort, the boy needs to see the value of the skill he is practising. And he needs to see the ability to spell accurately as a skill worth cultivating for his own personal development.

When reflecting on the findings in Chapter 9, I realised that I might have been projecting my own enthusiasm for accurate spelling onto the boys I taught. I believed that if I created fun games to play and showed the boys different strategies to use when learning spelling or taking spelling tests, that I would help them change the way in which they saw spelling. While some boys responded well to the fun games during the lessons[10], I now feel that the enjoyment was more around the competition of beating their peers, than it was about their need to learn their words. I understand more fully, now, that amount of personal interest in spelling, a low value placed on spelling and the lack of enthusiasm to improve the ways in which they learn spelling words, are all part of motivation, and all have a direct effect on working memory. Principle 3 of the ULM shows that motivation affects working memory' functioning, and therefore affects how learning to spell words happens and the ability to retrieve those words when needed. This new insight of the connections between motivation and knowledge gave me a better understanding of the conscious choices of words the boys use in different writing tasks.

[10] The games were mentioned by a few boys, and their comments reflected that not only did they enjoy the games, but the boys felt the games helped them remember their words. I am unsure how their recalling of the correct forms of the words translated into their classroom practice, however.

How motivation and knowledge affect the boys' conscious choice of words when engaged in written tasks

All 18 boys used a richer vocabulary when they spoke than when they wrote. The findings in Chapter 10 revealed that the boys wanted to be able to demonstrate their abilities to write, they wanted to make their parents and teachers proud of them, and they wanted to be proud of their own work. Yet, they were held back by fear of failure.

The findings indicate that the fear of failure seemed to have at its source a lack of conservation of accurate spelling. Conservation of words requires a broad knowledge base of all that is concerned with spelling, and strong, widely connected networks from which to access the knowledge. The boys knew, however, that they could not remember the spelling words from one week to the next (Chapter 8), yet it was just too difficult to find the motivation to drive the effort needed to make changes in the ways the boys approached their spelling practice (Chapter 9). The boys appeared to have identified themselves as poor spellers, which meant they did not see themselves as competent writers. In written tasks, the boys knew they could not spell well, and so consciously chose the easier words over the words they would normally use, and, in fact, wanted to use (Chapter 10). In addition to this, the boys seemed to know that they would get low marks for written tasks where accurate spelling counted, but they also seemed to understand that they would get low marks for these tasks because they chose simple words, where the teacher may be looking for the more complex words.

The findings in Chapter 10 showed me that the conscious choice of words the boys made when writing a paragraph where marks would be deducted for spelling errors, was complex. The boys consistently made a conscious choice to offer a product (the paragraph) of which they could not be proud, and that did not reflect their true thinking. These conscious choices were informed by anxiety, the boys' lack of value placed on spelling, their expectations that they would fail (or at least achieve lower marks than they strived for) and their belief that they could not produce a good piece of writing (self-efficacy). The more the boys had to engage with these tasks where spelling counted, and where they experienced repeated failure (perceived or real), the stronger their feelings of not being 'smart' or 'clever' became.

The data revealed a highly complex relationship between prior knowledge and the boys' choices of words when writing a paragraph, or in any classroom task where spelling was

considered important. I had previously thought that if I could, first, find a topic that was appealing enough (drew on the boy's prior knowledge and experience), secondly, find the right (achievable) goal to work for and thirdly, I provided the right scaffolding[11] for the task, that the boys would then enjoy writing the paragraph. I even tried to teach the boys to edit their sentences, as I thought it would help them find their errors before the teacher did, and because they would be able to hand in a piece of writing with confidence. Editing their work was, however, a skill in which the boys did not want to engage! I now understand why. If writing the paragraph is so difficult to begin with, asking the boys to edit a piece of work of which they are not proud, and asking them to engage in skill they have little interest in developing, was simply asking too much. Once again, I seemed to be trying to remediate the behaviours of the boys, without fully understanding how intricately, on a neurological level, prior knowledge, motivation and working memory were connected.

What stood out most for me was how the data revealed the role motivation played with regards to a) learning the spelling words, b) being able to recall the correct form of the words, and c) being confident enough to use the bigger, more complicated words in their writing. I would argue that the gap between learning and applying spelling in different classroom situations can be more easily understood by paying closer attention to the role motivation plays in the learning process. The boys in this study reported that: learning to spell was hard; being offered rewards for achieving their goals with respect to marks had worn off; using strategies such as breaking the words down (decoding) and using the same method to build words (encoding) was not working; and that even though the boys understood the value and purpose of accurate spelling, they could not seem to find the energy (Piaget, 1981) to put into learning the correct form of the words, or applying their knowledge of spelling rules.

Referring to figure 16, we can follow the green line connecting knowledge with working memory. Principle 2 states that 'working memory's capacity for allocation is affected by prior knowledge' (Shell et al, 2010). For the boys in this study, their prior knowledge of spelling such as phonics, sound-symbol combinations, words and spelling rules have not yet been consolidated over their school years. As a result of this poor knowledge base, there will be less capacity for learning new words in working memory. Due to the reduced base of knowledge

[11] For these 8- and 9-yrear old boys, scaffolding might take the form of sentence starters or a plan of writing such as the 'hamburger plan' where the introduction and conclusion are represented by the hamburger buns, and the burger patty, salad and sauces represent the information in between.

of spelling, motivation is negatively affected. Motivation to learn the words directs how much of that reduced capacity is available for the boy's use (Principle 3). Understanding these connections on a neurological level was a revelation to me.

The findings in Chapter 8, 9 and 10 have shown me that so much of the anxiety, low self-efficacy, low values of spelling and the skill of accurate spelling, in fact low motivation in general, seems to stem from the inability to conserve the spelling of the words the boys want to use. Whether it be remembering the correct form of the words in a spelling test, or consciously choosing simpler words in written tasks, the fact that the words are not fully available to the boys when they need the words was a new insight for me.

The data has also revealed that the boys in this study have shown remarkable metacognition when it comes to understanding their problems with spelling and applying their knowledge. All the boys exhibited a keen understanding of their home and school environments, and the expectations that come from both these sources. The boys showed a noteworthy insight into their abilities (or lack thereof) when it came to spelling. In spite of their understanding and insight, however, the boys did not seem to be able to find the motivation to master spelling as a personal skill. They knew what to do when it came to creative writing and spelling (procedural knowledge), but they could not seem to apply it to their own work. This conflict highlights the need for a better understanding of the role motivation plays in learning to spell.

Answering the research questions

The preceding sections of this chapter have answered my 3 sub questions:

1. What do different theorists say about learning in general, and the role of motivation in particular?
2. How do Grade 4 boys feel about spelling and writing tasks?
3. How do these boys react in response to spelling and writing tasks?

Sub question 1

The theories posited by both Piaget and Vygotsky have guided my understanding of how knowledge is acquired, and this knowledge has informed my practice as an academic support teacher. Both these theories gave me valuable insight into understanding where, developmentally, cognitively and emotionally, the boys I teach stood at the ages of 8 and 9

years old. Both theories of learning helped me understand effects of motivation in the learning process. The guidance these theories offered helped hone my own teaching practice. The ULM has further enhanced my understanding of what the literature has said about classroom learning. The new insight I have gained from using the ULM as a frame to analyse the data has helped me to go beyond trying to remediate only the boys' behaviours towards spelling. I now have a clearer understanding that perhaps it is not a conscious decision on the boys' part not to engage with a spelling task, but perhaps it is a decision that is made on a subconscious, neurological level.

Sub question 2

The findings in Chapters 8 to 10 indicated that the boys all felt great anxiety around spelling for many different and varied reasons. All 18 boys in this study knew that they did not have a good knowledge base of words and their correct forms, nor did the boys feel they had a good understanding of the rules governing spelling. The 5 boys who speak English as a second language indicated that they did not have a good knowledge of the deeper constructs of the English language (such as homonyms, homophones, synonyms and, antonyms) either. While I already knew the boys did not like to write creative paragraphs, I now have a clearer understanding of the reasons that informed those emotions. Before this study, I had not considered that the boys' value system regarding spelling would have an influence on their attitudes towards spelling and writing. Yet, the findings indicated that the value system is an important cognitive motivator that had an effect on working memory's functioning, and on how knowledge was constructed. This was not something I had thought to consider when developing lessons for these boys.

Sub question 3

The findings in Chapters 9 and 10 showed that the boys felt that they put effort into learning their weekly words, but the results of their spelling tests and written tasks did not reflect this effort. On closer inspection of the data, I found that, although most of the boys tried to practise daily, this was often not the case, especially in weeks where the boys had to write a formal assessment. The findings in Chapters 8, 9 and 10 also revealed that the amount of effort needed to learn and apply spelling words was often overwhelming for all 18 boys.

Overall, the boys' behavioural response to spelling and written tasks was to place a low priority on developing the skill of accurate spelling, and, because their knowledge of the correct forms

of words was reduced, they chose to use more simple, easier-to-spell words when engaging in written tasks.

The answers to these 3 questions have helped me to answer the main question of this study:

What is the role of motivation in understanding the disconnect between learned and applied spelling in all kinds of written work with Grade 4 boys?

Shell and co-authors (2010) refer to motivation as '…the primary influence of how much of available working memory capacity is actually used'. Motivation certainly has a more powerful influence on the boys' abilities to learn and apply their spelling knowledge than I had previously understood. I realise now, prior to this research, that I was only considering the behavioural aspects of trying to motivate the boys I taught, and that I was missing the crucial connection – that of motivation's effects on working memory. Alloway (2011) argues that working memory '...is a better predictor of academic success than IQ because it measures a student's potential to learn, not what they have already learned' (p 15). With regards to spelling, understanding the role motivation plays in learning in general, and learning to spell and apply words in particular, is crucial to understanding the disconnect between learned and applied spelling in all kinds of written work with this group of Grade 4 boys. When placed into the ULM frame, the thoughts and comments of the boys in this study, together with their emotional responses to spelling, their fear of failure, their lack of prior knowledge and their consciously choosing simpler words in their written tasks, all fall squarely into the motivation component of learning. Shell *et al* have shown just how fundamental motivation is to keeping working memory as fully available for learning as possible for all written tasks – in fact, for all learning.

Reflections on the limitations of this research and what the research could mean for teaching practice

One limitation of this study is that the group of boys interviewed was small. However, considering the deep level at which I engaged with their words, searching for as many connections to the components of the learning process as possible, I do not believe I could have coped with information from a greater number of participants. The boys' comments and thoughts around spelling and their written tasks revealed so many different connections and nuances around learning to spell, prior knowledge and motivation. Although so many of the

boys' comments indicated, among other things, that the boys were having difficulties with working memory as I understood it at the time of the interviews. I did not, however, truly understand the implications of these references until I began to analyse them using the ULM.

A second limitation to the study was that each boy had only one interview. In total, 8 interviews were conducted – 4 interviews as one-on-one sessions and 4 interviews with different groups. It was difficult to co-ordinate the times for the interviews as each boy had a different afternoon schedule, and while only some boys preferred to be interviewed on their own, most of boys chose to be interviewed in groups. Of the boys who chose to be interviewed on their own, there was a chance that some of them had not felt confident enough to voice their thoughts in a group. In the group situations, there was a chance that the boys had not really thought about some of the questions and so copied their peers' thinking. With the exception of Panther, who tended to let Steve speak first and often echoed Steve's answers, I believe the boys truly wanted their voices to be heard. I believe the boys felt comfortable enough with me[12] to trust me when I said that their answers to the questions would remain confidential and their anonymity protected. I would have liked to have been able to observe the boys' behaviour in the class situation, but the incompatibility between the teachers' timetables and my own timetable did not allow this. In retrospect, I am not sure I would have seen an authentic example of their behaviours during spelling or writing lessons as the boys would have known why I was there and have made sure to be on their best behaviour. I think their answers in the interviews were a true reflection of the boys' feelings around spelling.

Another limitation to this study is that I was unable to obtain examples of the boys' writing in a range of subjects, not only in spelling or writing lessons, to illustrate the kinds of spelling errors the boys were making. I conducted the interviews mainly in the second half of the school year in 2019, and by the time I wanted to analyse the boys' writing, their workbooks had already been sent home. In 2020, with online learning due to the COVID 19 pandemic, the boys did not submit many examples of hand-written tasks. Although the boys still completed weekly spelling tests, and had to complete comprehensions, these tasks were collected via a Google Form. I do not think, however, that the *kinds* of errors the boys made with spelling and writing tasks would have influenced the findings of this study, as the focus was the boys' feelings around spelling and how motivation affected their application of spelling. But I think

[12] I had been their academic support teacher the year before.

that being able to analyse the boys' writing would have enhanced my understanding of the boys' difficulties, and possibly shown which aspects of spelling caused the most problems – for example, the different spelling of the vowel sounds or difficulty applying the spelling rules or not knowing the homophones or homonyms of words.

Nevertheless, I believe that the boys answered the questions honestly and authentically. Each boy seemed to want to be heard. Each boy seemed to want to voice his struggles, his thoughts around spelling, anxiety and pressure to perform, and each boy even had his own suggestions to help another (hypothetical boy) succeed in writing tasks.

So, how could this research help teachers and academic support teachers? To begin with, I believe that motivation and its effects on learning needs to be taken more seriously. This study has shown that the emotions, attitudes and value systems these boys have around learning to spell, applying that spelling and feeling proud of their efforts, all have their roots in motivation.

For future practice, both mine and other teachers or educators from different disciplines, I will look first at how to alleviate the pressure on working memory before I think about making a game fun, or a worksheet look pretty. Enabling learning is not merely a case of offering rewards or making an activity novel or completing many practise work sheets or even providing effective feedback after tests or paragraphs have been handed back. If the boy is not invested in developing the skill of accurate spelling for his own development, he will not be convinced that accurate spelling is worth it – neither on the behavioural level of putting effort into his practice nor on the neurological level. In order to enable learning more successfully (in this case learning to spell), I have found the value in asking the kinds of clarifying questions that will show me the child's[13] motivation, in all its forms, before beginning therapy sessions, so I that can have a better understanding of what could be going on a neurological level. Perhaps the findings in this thesis could influence best practice of classroom teachers, and inspire them to find different ways of assessing spelling knowledge that does not place great emphasis the marks attached to spelling tests. Allowing more time to learn the words and the governing rules would be a good place to start. Perhaps this study might help teachers could find different ways to encourage children to give their best efforts when engaged with classroom writing.

[13] I am now in private practice.

In terms of possible future research, I think a deeper study of the role of motivation would be valuable. I think that a study involving girls would be valuable, to ascertain whether the findings of this study are consistent with the ways in which girls feel about learning and applying words.

It would also be interesting to use the findings of this thesis to design a spelling programme flexible enough to accommodate students' differences in learning to spell, or even to find a way in which to assess (test) spelling that takes into account the limitations of a reduced working memory capacity.

I think it would be interesting to use this model to assess the relationships between working memory, knowledge and motivation with children who struggle to learn and apply Maths knowledge.

I believe that a further study as to what kind of spelling programme, or curriculum, would suit children such as the boys in this study would be a valuable addition to education. There is not a 'one way suits all' answer to teaching and learning spelling as each child brings their own personal beliefs, value systems, abilities and emotions to the learning experience. Perhaps research could be done around adapting the programmes the school already uses to suit those children who struggle with learning and applying spelling.

My research journey has come to an end for now. I trust that this thesis has lived up to the values and principles of a research study as outlined by Merriam and Associates (2002). It has been crucial to my study - and to myself as a human being, teacher and researcher - that I conducted this research ethically; that my methods and findings are valid, trustworthy and reliable; and that my findings reflect the boys' thoughts and emotions authentically.

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