

# The Impact of Fetal Alcohol Syndrome on a Child's Classroom Performance: A Case Study of a Rural South African School

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## **My Dieper Dors**

*Deur Reabrian Witbooi:  
Graad 7 Elizabethfontein Primêr*

Iets gee 'n skop  
Jy kan nie die ongebore bab fop!  
Hy will saam met sy moeder praat  
oor die toestand waarin sy hom laat.  
Die alkohol wat sy oor hom stort  
en dan sy lewe verkort.

Ma, moet my nie so laat pleit  
as ek gebore word kom daar weer spyt.  
Here, help dis duister!  
Hoe bereik ek eendag my droom?  
Ma, dryf uit die helse gees.  
Ek leef in alkoholvrees.

Die alkohol is te veel; ma trek rem.  
Die dag wanneer ek gebore word, is ek gestremd.  
Hoe kan ma in so 'n toestand leef  
dis my lewe waarna ek streef.  
Ma ek is verlore  
al is ek ongebore.

Ma ek maak staat  
op die toestand waarin u my laat.  
Ma ons kan saam veg.  
Neem die alkoholsindroom weg.  
Ons los die sindroom in God se hand.  
Ons sê aan alle ouers wat hier bywoon.  
Verduidelik tog vir almal die sindroom.

(Dedicated to Eland on Sunday 23 September 2007 during a  
youth development workshop on the Prevention and  
Awareness of Fetal Alcohol Syndrome)

## **My Deeper Thirst**

*Translated by Melissa Lubbe*

Something gives a kick  
You can't blindside the unborn kid!  
He wants to confront his mother  
about the conditions he must suffer.  
The alcohol she douses him in  
that douses off his life will skim.

Mom, please hear my plight  
before it's too late make it right.  
Lord, banish this darkness!  
How can I achieve my dreams?  
Mom, exorcize this evil ghost.  
I live in fear of the next toast.

Mom slow down, the alcohol is too much  
I will be disabled from our fist touch.  
How can you live in such strife  
I am fighting for my life.  
Mom my life is ruined  
Before it has even started.

Mom I am defenceless  
dependant on your soberness.  
Mom together we can battle  
And make alcohol syndrome crumble.  
We leave the syndrome in God's hand.  
Thus all present, do not condone.  
Remove the veil of this syndrome.

## Abstract

Fetal Alcohol Syndrome (FAS) is the most severe of a spectrum of birth defects caused by a mother drinking alcohol whilst pregnant. Its manifestation in the Central Nervous System causes intellectual and behavioural abnormalities, which pose considerable challenges in the classroom. This case study explores the classroom environment and educational outcomes of learners with FAS in a rural South African school.

The study was conducted at Elizabethfontein Primary School (EFPS), a farm school near Clanwilliam in the Western Cape. The sample comprises of all 170 learners in Grade 1 to Grade 4. A prevalence rate of FAS of 124 per 1000 (12.4%) was found. EFPS is a Quintile 1 school that relies heavily on fundraising (especially in the form of Riel Dancing) and sponsorship to afford extra staff (such as Koshuis Tannies and teaching assistants), maintenance and transportation of learners. The lack of Grade R school preparation and the environment learners grow up in results in discipline problems, many learners repeating, being progressed before they are ready and a high dropout rate. Child abuse and neglect is common today, prompting the EFPS boarding house to act as “safe haven” during the week for two thirds of its learners. The school provides security, routine and constant meals (as part of the School Nutrition Program and supplemented by the school garden).

Data on educational outcomes was collected through participant observation (classroom behaviour), collection of information from existing sources (Home Language Marks and Mathematics Marks) and collection of new data (Reading Score). A physician diagnosed those children with FAS using a three-stage process. Having FAS is associated with lower home language marks (2.8 to 8.55 percentage points) and behavioural scores (1.73 to 4.21 percentage points). The mitigating effect of the school on FAS learners might have reduced the impact of FAS. Children with FAS struggle academically and in following rules and principles as they have lower intellectual capabilities and cannot generalise from one situation to the next. Memory deficits, especially verbally and visuospatially, present challenges in following instructions and copying from the board. Children with FAS are also hyperactive, distractible and inattentive, which causes classroom disruptions and pose a negative externality to other learners. They find it difficult to follow social cues, but want to be helpful and well liked, making children with FAS vulnerable to manipulation. Strategies for intervention have been explored by specialised schools and studies, but must be translated into viable options for the mainstream under-resourced classroom.

In order to develop appropriate strategies for classroom intervention a comprehensive understanding of FAS in this context must first be established. Many learners are isolated by a lack of tarred roads and cell phone reception within the

large catchment area of EFPS. As descendants of local tribes and slaves the history of this farming area still influences them today. The legacy of the Dop system can still be seen, as alcohol forms a cornerstone of social interactions, especially in binge drinking over weekends, which exposes children to the cycle of alcohol addiction from a young age. Racial segregation and the impact of Apartheid have influenced the educational trajectory of coloured children.

The value of this study lies in the in-depth insight into the context learners find themselves in, and the specific challenges associated with FAS learners. Future studies can build on the methodology and explore ways to improve the lives of children with FAS. Research must be interdisciplinary and in collaboration with the community. In response to this research EFPS has declared 2016 as "*The Year of Alcohol Awareness*". Intervention strategies must be aimed towards these isolated, under resourced communities.

## Dedication and Acknowledgements

***Dedicated to the learners with FAS that I met during this study.  
May this allow their voices to be heard.***

This study would not have been possible without the love and dedication of the learners and staff at Elizabethfontein Primary School. Ms Annetjie Dames, and her dedicated staff welcomed me from the start and supported all my initiatives. Thank you to the inhabitants of Clanwilliam who invited me into their homes and shared their stories. A special thanks goes to Tant Lu for her hospitality during my stay in Clanwilliam. My sincere thanks to Dr Ross Murray for time, effort, patience, and going out of his way to help me with this study. Without this support this study would not have been possible.

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## Glossary of Term

### AllPay

The colloquial term used to describe the payment of government grants such as child support grants and old age pensions, which occur on one designated day a month.

### Anthropometry

The measurement of the human body, specifically in terms of height, weight and head circumference, to allow comparisons to norms.

### ATKV (Afrikaanse Taal en Kultuur Vereniging)

A society for the celebration and preservation of the Afrikaans language and culture.

### Binge Drinking

An episode of heavy consumption of alcohol within a short period of time.

### Boarding House

A facility that allows learners to eat, sleep and live at school for a period of time instead of returning home.

### Catchment Area

The area from which the learners of a school are drawn.

### Central Nervous System (CNS)

System of nerves controlling the body, consisting of the brain and spinal cord.

### Cognitive Deficits

Intellectual disability resulting in limited learning ability.

### Combined Classes

A class that consists of learners from more than one school grade.

### Concrete Thinkers

Individuals who view the world literally and have trouble thinking abstractly and making abstractions (taking an idea into a different situation).

### Counterfactual

An individual or situation that is identical in every respect to the one measured apart from one characteristic, allowing the measurement of the effect of that characteristic alone.

### Departmental and Governing Body Posts

Teachers at a *government school* in South Africa are employed by either the South African *Department of Education* or a *School Governing Body*. Those teachers with departmental posts are paid for and responsible to the Department of Education. Those appointed by a school's Governing Body are paid by and responsible to the Governing Body. The latter are funded by school fundraisers and financial contributions of parents.

### Department of Education

A department of the provincial government responsible for the governing and monitoring of education.

### Dop System

A payment scheme where labourers receive part of their wages in alcohol.

### Dysmorphology

The study of abnormal physical taints, such as abnormal facial features.

### Educational Outcomes

The measurable effects of being educated, often recorded by class marks and other desirable attributes of an educated person.

### Externality

The effect of an action carried by a person or party not carrying out said action.

Positive Externality – the gain or benefit received from another person's actions, such as the knowledge a family can attain from the education of a child.

Negative Externality – the cost carried by a person or community for the actions of someone else, such as the cost to a child's learning because of the negative behaviour of another learner leading to class disruption.

### Farm School

A school that is located in a rural, farming area, in comparison to a school located in a town or city.

### Fetal Alcohol Spectrum Disorder (FASD)

A range of birth abnormalities caused by a mother consuming alcohol whilst pregnant, the most severe of which is FAS.

**Fetal Alcohol Syndrome (FAS)**  
The most severe manifestation of a series of birth abnormalities caused a mother consuming alcohol whilst pregnant.

**Gini coefficient**  
Measure inequality of a population group as the difference between actual income distribution and perfect cumulative income share.

**Government School**  
A school that is run and governed by the provincial department of education.

**Grade R**  
A preparation year for learners who are 4 turning 5 to ensure they are ready for formal education from Grade 1.

**Home Language**  
The first language a child learns at home which should be the language of instruction at school. In the curriculum refers to the primary language of instruction.

**Hyperactive**  
Extreme, abnormal and disruptive activity often associated with ADHD (Attention Deficit Hyperactive Disorder) where a child's extreme activity levels interrupt learning.

**In Vitro**  
An embryo whist inside their mother's body, also used to describe what occurs during pregnancy and the effects thereof.

**Intelligence Quotient (IQ)**  
A score of human intelligence derived from standardised testing, with a median score of 100 (average intelligence) and a score below 70 regarded as being a person with an Intellectual disability (ID).

**Intervention**  
Specific tools and strategies used to help and support learners who are behind in learning areas such as reading.

**Kinetic Recognition Strategies**  
The involvement of movement to trigger memory, such as tapping when reading a t.

**Matric**  
The final exams written at the end of Grade 12, signalling the completion of school. If a learner passes these exams they have "received a matric", higher marks are required to receive a "bachelors pass" which allows entry into tertiary education.

**Microcephaly**  
A birth defect where a child is born with a small head, associated with decreased brain functioning.

**Mid-Year Report**  
The evaluation of a learner's progress in June in terms of marks for specific subjects, presented to parents.

**Neurodevelopmental Deficiencies**  
Impairments in the growth of the brain and *central nervous system (CNS)* that results in *cognitive and neurological deficits*.

**Neurological Deficits**  
Weak functioning of the brain that results in abnormal functioning of other parts of the body.

**Opportunity Cost**  
The cost of a lost alternative such as the income receivable if a different action was chosen.

**Partial Fetal Alcohol Syndrome (PFAS)**  
A series of birth defects less severe than FAS, caused by a mother consuming alcohol whilst pregnant. Also known as Fetal Alcohol Effect (FAE).

**Phase**  
A stage of school consisting of 3 grades (a learner may only spend 4 years in each):  
Foundation Phase – the first stage of schooling consisting of Grades 1 to 3  
Intermediary Phase – the second stage of schooling consisting of Grades 4 to 6  
Secondary Phase – the third stage of schooling consisting of Grades 7 to 9  
FET (Further Education and Training) Phase – the final stage of schooling consisting of Grades 10 to 12.

**Philtrum**  
Section of the face between the nose and upper lip, normally displaying ridges, but flat in children with FAS.

Phonetics

The description of language and words in terms of sound.

Prevalence Rate

A measure of how commonly something occurs within a specific group.

Price Setter

An entity with the majority power in a market who is able to control the price of a specific good or service.

Privacy Board

A physical separation between the desks of learners, often in the form of cardboard folded to cover three sides of the desk. This obscures the view of other desks, but is cut low enough that children can still see each other's faces.

Progression

If a learner is unable to attain the marks necessary to pass the year at school, but has already repeated within that phase they are progressed to the next grade. Also see *repeating* and *promotion*.

Promotion

A learner is moved to the next grade when they pass with the minimum requirements. In contrast to *repeating* and *progression*.

Public Drivers Permit (PDP)

An additional drivers permit required to drive a vehicle transporting members of the public, such as a school bus.

Quintile 1

South African public schools are divided into 5 groups (quintiles) for the allocation of financial resources, based on the poverty of the surrounding community. Quintile 5 is the "least poor" whilst Quintile 1 is the "poorest" and comprises 8.6% of Western Cape Schools.

Repeating

When a learner does not achieve the marks necessary to pass a grade they can be kept back to repeat the year. This may only happen once per phase. Also see *promotion* and *progression*.

Riel Dance

Traditional Khoi and San dance involving the depiction of the courting rituals of the original tribes. It involves specific fast footwork, the impersonation of animals and the pairing of boys and girls.

School Governing Body (SGB)

A group of representative parents and teachers responsible for protecting the interests of learners in the running of the school.

Socioeconomic Status (SES)

A measure of economic and social position based on income, education and occupation.

Tannie

The Afrikaans word for Aunt, a term of respect for any woman older than the speaker.

Teaching Assistant

An extra staff member in the classroom, usually not qualified as a teacher, to help support the main teacher in tasks such as administration and specialised attention for weaker learners.

Teratogen

Substances known to affect an unborn child in a negative way, such as alcohol.

Unit of Alcohol

Measured as 10ml of pure alcohol, which can be found in half a glass of red wine or 170ml of beer.

Viticulture Industry

The farming and production of wine.

Visuospatial Memory

The ability to remember and visualise where objects are placed in relation to each other.

Wendy House

A wooden structure, often used as a playhouse for children. In this context its structure is similar to a garden shed, often insulated and placed on bricks without a permanent foundation. In South Africa these houses can become a primary dwelling.

## Chapter 1: Introduction

Fetal Alcohol Syndrome (FAS) is a birth defect caused by mothers drinking alcohol excessively whilst pregnant. Despite the debilitating effects of this syndrome on children, the prevalence and effects on learners in the classroom has not been scrutinised in South Africa. Mothers still admit to consumption of alcohol during pregnancy, a phenomenon often attributed to the Dop system, now outlawed in South Africa (May et al., 2000). Children with FAS are often left to struggle at schools that cannot meet their specific developmental needs, which greatly reduces their chances of becoming productive members of society.

### a. Defining FAS

If pregnant mothers misuse alcohol the fetus can sustain brain damage which causes FAS and leads to long-term developmental problems (Schneider et al., 2007). The earliest reports on the effects of alcohol consumption during pregnancy on the fetus were done in 1899, the patterns of which are outlined in 1973 by Jones and Smith. In order to be diagnosed with FAS children have to display (1) facial and other dysmorphism, (2) diminished structural growth for their age, and (3) developmental delays (intellectual and social). Confirmation of maternal alcohol use can inform a diagnosis (May et al. 2000, p.1905). The continuum of effects of prenatal alcohol exposure is referred to as Fetal Alcohol Spectrum Disorder (FASD), the most severe of which is FAS (Viljoen et al., 2005, p.594). Fetal Alcohol Effects (FAE) or Partial Fetal Alcohol Syndrome (PFAS) describe milder forms of FAS, where a child does not display all the physical features required for a FAS diagnosis. (Streissguth et al., 2004, p.288)

FAS is regarded as one of the most common causes of learning disabilities worldwide (Urban et al., 2008, p.877) and is a health outcome that is 100% attributable to alcohol misuse. In South Africa FAS is included alongside homicide and violence, alcohol dependence and road traffic injuries as one of the negative effects of alcohol consumption (Parry et al., 2005). Despite its relatively widespread prevalence and detrimental effects, the consequences for the learning ability and education of children with FAS are not widely researched.

### b. International Research

Little (1977, p.1154) researched the relationship between moderate alcohol consumption of expectant mothers and their child's ultimate birth weight. He conducted interviews with patients who sought prenatal care with regard to their alcohol consumption before conception, and in early and late pregnancy. As one of the earliest studies connecting alcohol consumption to birth defects, it was particularly attentive to separate the effect of maternal alcohol consumption from cigarette smoking (which has also been proven to decrease birth weight) by using a sample in which alcohol and tobacco use was not significantly correlated. He found that respondents' alcohol consumption decreased considerably after conception. His

study also showed that alcohol consumption just before and in late pregnancy was significantly related to infant birth weight. However, his findings are not definitive. Incidence of alcohol consumption is likely under-reported due to the stigma attached to drinking whilst pregnant. His sample was also not representative of the general population, as it only comprised women choosing to seek prenatal care. Further, birth weight is not the only determinate of fetal health.

Streissguth et al. (2004, p.228) researched the deficits in intellectual, academic, and adaptive living skills of children with FAS in Washington State in the USA. Individuals diagnosed with both FAS and FAE experience negative effects stemming from neurodevelopmental deficiencies. These were classified into five Adverse Life Outcomes: inappropriate sexual behaviour; disruptive school experiences; trouble with the law; confinement; and alcohol and drug problems. Minimisation of disrupted school experience is the ultimate aim of this research. However, this requires a thorough understanding of the problem, to which this study aims to contribute.

The effects of Central Nervous System (CNS) deficits caused by the syndrome complicate the educational experience of a child with FAS. These include developmental delays, hyperactivity, attention deficits, learning disabilities, intellectual deficits or seizures (Streissguth et al, 2004, p.229). In their study 42% of individuals with FAS participated in special education and 65% required remedial help in reading and maths. IQ scores, achievement, and adaptive behaviour results were considerably lower than population norms.

### **c. South African Research**

#### **i. The Alcohol Problem**

Alcohol plays a central role in South African society. Historically, alcohol was exchanged for cattle and labour (Parry, 2005, p.426). In comparison to other race groups, coloured females displayed the highest prevalence (percentage of respondents reporting drinking within the last week) of consumption among females for most categories of alcohol from 2010 to 2011 (van Walbeek & Blecher, 2014, p.35). Alcohol consumed per drinker in South Africa is among the highest in the world at 20.1 units per week for an adult (Parry, 2005, p.426). The World Health Organisation undertook an analysis of the drinking patterns in countries (rather than simply considering the amount of alcohol consumption), measured on a scale of 1 (least risky drinking pattern) to 5 (most risky drinking pattern) (WHO, 2014). The score is based on alcohol consumption per occasion, festive drinking, proportion of drinking events where people get drunk, proportion of daily drinkers, drinking with meals, and drinking in public. South Africa attained a 4 on this scale and is noted as one of the countries where the most risky drinking patterns occur. Many government treatment centres dealing with alcohol related problems have been closed, and those

left are not adequately distributed geographically. The number of private treatment centres has increased, but the poor cannot afford to attend. Specific programmes have been developed targeting pregnant women in the areas where treatment is available, but the rural regions of South Africa are seldom covered by these services.

The social history of alcohol includes the legacy of the “Dop system” in the Western and Northern Cape, where farm workers were controlled through subsidising wages with alcohol (Schneider et al., 2007, p.665). Many farm labourers became addicted to alcohol, which formed a cornerstone of social interactions. Although the use of alcohol as payment has been outlawed, the legacy of the Dop system is still in place today, especially in the form of binge drinking over weekends (Croxford & Viljoen, 1999, p.964).

Alcohol consumption during pregnancy is an ongoing problem in South Africa. Croxford & Viljoen (1999, p.964) conducted interviews with women attending antenatal clinics in selected areas of the Western Cape (George/Oudtshoorn, Vredenburg/Saldanha and the Cape Metropole). The researchers selected clinics that support low socio-economic status (SES) communities. In their study 42.8% of respondents admitted to consuming alcohol during pregnancy. In keeping with other research, it was found that beer was the main type of alcohol consumed, and that consumption took place mainly over the weekend in a “binge” pattern. Women were aware of the possible harmful effects of alcohol consumption on their unborn babies. Extrapolating from the American experience, it was estimated that 9,5% of the babies of participants would present with FAS. This study was, however, done in a metropolitan area during Apartheid South Africa, which brings into question its representativity.

## **ii. Incidence of FAS**

Estimates of the prevalence of FAS vary across countries and population group, between districts, and over time. Abel & Sokol (1991, p.514) estimate a rate of between 0.33 and 2.2 per 1000 live births in the United States. The prevalence of FAS in the developed world was estimated at 0.97 per 1000 in 1995. For most population groups the rate seldom exceeds 10 per 1000, however, rates are not always comparable due to the wide range of methodologies used for diagnosis (May et al. 2000, p.1905).

Early research into the incidence of FAS in South Africa was conducted by Palmer in 1985 in Cape Town, and found a prevalence of 3.56 per 1000<sup>[1]</sup> live births (Croxford & Viljoen, 1999, p.964). This study was not, however, as comprehensive as later studies, and only considered a specific section of the population.

A more comprehensive study was conducted by May, et al. (2000, p.1909) in Wellington to determine the characteristics of FAS in that community by analysing

data on Grade 1 learners. They found a range of prevalence between 39.2 and 42.9 per 1000<sup>[2]</sup>. A two-tier method was used, where learners were measured and assessed for physical manifestations first. Those that showed physical signs of FAS were then tested for their social and intellectual development. Children with FAS scored significantly lower on neurodevelopmental tests, negatively influencing their school performance. Many pupils who had to repeat Grade 1 had FAS. The majority of cases originated in rural areas, and this distribution was significantly different from what could be predicted by random distribution. This was the first study in South Africa to screen all the children in a specific school.

Viljoen et al. (2005, p.594) conducted a second study in Wellington using the same methodology adopted by May et al. (2000). This study centred on children mostly born in 1993, a year before the end of Apartheid. Children with FAS achieved significantly worse developmental scores, especially with regard to verbal ability. The study found an incidence rate of 73 per 1000<sup>[3]</sup>. Compared to the previous study in this area, the measured rate of FAS increased by 60%, taking into account changes in population composition. Part of this increase may be as a result of an increase in the supply of alcohol. These results must be treated with caution, however. Firstly, generalisations based on research done in small towns are problematic. Secondly, respondents in South Africa may be more honest about their alcohol consumption than those in other countries (Viljoen et al., 2005, p.596).

May et al. (2007, p.259) conducted a third study in the Wellington area, which included a focus on partial fetal alcohol syndrome (PFAS). Participation in this study dropped slightly from previous studies, but was still high at 81%. They found a prevalence rate of 68.0 – 89.2 per 1000<sup>[4]</sup>, 3.9% higher than their previous research in this area. This decreased rate may be as a result of underreporting due to decreased participation. In the fourth Wellington study May et al. (2013, p.818) added the diagnosis of Alcohol-Related Neurodevelopmental Disorders (ARND) where the child displays brain abnormalities as a result of significant prenatal alcohol exposure, and Alcohol-Related Birth Defects (ARBD) which include physical manifestations of prenatal alcohol exposure, but not the required cognitive deficits. This inclusion resulted in a substantial overall prevalence rate increase, but the rate of FAS and FAS/PFAS has remained relatively stable at 59.3 – 91.0 per 1000<sup>[7]</sup>.

Urban et al. examined FAS and PFAS in Grade 1 pupils in De Aar (a sheep-farming area in the Upper Karoo) and Upington (a viticulture area) in the Northern Cape (2008, p.877) in a cross-sectional two-tier study. Learners with FAS were found to be older than other learners in their class, mainly because of repeating of Grade 1 due to poor performance, or delayed school entry. The study found a FAS incidence rate of 64 per 1000 in De Aar<sup>[6]</sup> and 97 per 1000 in Upington<sup>[5]</sup>. Children with FAS displayed poorer intellectual functioning, shorter concentration spans, and less developed language skills.

More recently, Olivier et al. (2013, p.402) conducted a survey in Aurora – an isolated rural village on the West Coast of the Western Cape province –to determine school prevalence of FAS and PFAS. Drinking during pregnancy remains a problem in the village, despite national efforts and media coverage of the risks. The social determinants that cause women to turn to alcohol, such as low SES, little education, single-parenthood and low religiosity have remained largely unchanged (Olivier et al., 2013, p.403). This study focused on the children of farm labourers, not working in the viticulture industry. The two-tier approach was once again deployed. Although this study focused on all grades in the school, and not just Grade 1's, no association was found between FAS and grade or gender. An incidence rate of FAS of 100 per 1000<sup>[8]</sup> was found. Of the published studies to date, this one found the highest incidence of FAS. Given that the survey was done in a non-viticulture area, the results dispute the notion that high rates of FAS are solely related to viticulture where the practice of Dop originated.

This study was conducted in Clanwilliam a farming community in the Western Cape. The area's main produce is rooibos tea. All learners in Grades 1 to 4 at Elizabethfontein Primary School (EFPS) were tested using three rounds of investigation: anthropometry measurements (height, weight and head circumference); identification of facial features; and birth records. The study was unable to confirm maternal drinking, thus this may include incidences of PFAS. Unlike previous studies, the classroom environment, context and educational outcomes of learners were also examined. Findings were that learners with FAS received significantly lower scores for home language and classroom behaviour. Expansion of the sample size would allow a more thorough investigation into the effect of FAS on the learning experience, particularly whether these learners catch up or their the divergence in performance continues.

*Table 1.1 FAS Prevalence Rates from Studies in South Africa*

Area	Year Published	Viticulture	Sample	FAS Cases (Excluding PFAS)
Cape Town, Western Cape <sup>[1]</sup>	1985	N	Mothers	3.56 per 1000
Wellington, Western Cape <sup>[2]</sup>	2000	Y	Grade 1	42.9 per 1000
Wellington, Western Cape <sup>[3]</sup>	2005	Y	Grade 1	73 per 1000
Wellington, Western Cape <sup>[4]</sup>	2007	Y	Grade 1	89.2 per 1000
Upington, Northern Cape <sup>[5]</sup>	2008	Y	Grade 1	97 per 1000
De Aar, Northern Cape <sup>[6]</sup>	2008	N	Grade 1	64 per 1000
Wellington, Western Cape <sup>[7]</sup>	2013	Y	Grade 1	59 - 91 per 1000
Aurora, Western Cape <sup>[8]</sup>	2013	N	Grades 1-7	100 per 1000

The aim of this study is to: quantify the connection between FAS and educational outcomes, such as class marks, reading ability and classroom behaviour; and to describe other factors that undermine the education of children in this environment. The hypothesis is that FAS and other alcohol related environmental factors have a negative effect on all children's classroom performance, not only for those learners diagnosed with FAS.

I spent 6 months at Elizabethfontein Primary School in 2015 to gather comprehensive insight into the effects of FAS on classroom performance. All facets of a learner's life were examined. Chapter 2 describes the geographical context in which the learners grew up. I examine the history of the region including the learners' ancestral base. The development of schooling for coloured children is examined in connection to the current socioeconomic environment of the four catchment regions of EFPS. The effects of alcohol and the home environment of children are described in Chapter 3. The school context at EFPS, the protection it offers and challenges faced are described in Chapter 4. Specific challenges faced by a child with FAS and how these influence the classroom environment are outlined in Chapter 5, supported by anecdotal evidence from research at the school. Chapter 6 outlines my data collection method, and the data are described in Chapter 7. This forms the basis of the regression analysis in Chapter 8. The challenges and limitations of the research and the scope for future research are explored in Chapter 9. Appendix 1 contains a personal reflection on my time conducting this research.

## Chapter 2: The Geographic Context

This study took place at Elizabethfontein Primary School (EFPS), a farm school in the Western Cape of South Africa. As with any study, the context from which this school and its learners emerge shapes many of the interactions and effects highlighted in the rest of this paper. Learners at EFPS come from four distinct though interlinked regions, which are discussed in this chapter, along with the development of schooling in the area.

### a. Catchment Areas

Elizabethfontein Primary School (EFPS) is located 35km outside the Town of Clanwilliam, which forms part of the Cederberg Municipality in the Western Cape Province of South Africa. Figure 2.1 shows the catchment area of EFPS – that is the area where learners who attend the school live. This area is roughly 53km by 40km and can be divided into four regions: Clanwilliam town; the Agterpakhuis farming region; Bushmans Kloof; and Wuppertal. The history and current context of each of these regions is discussed below.

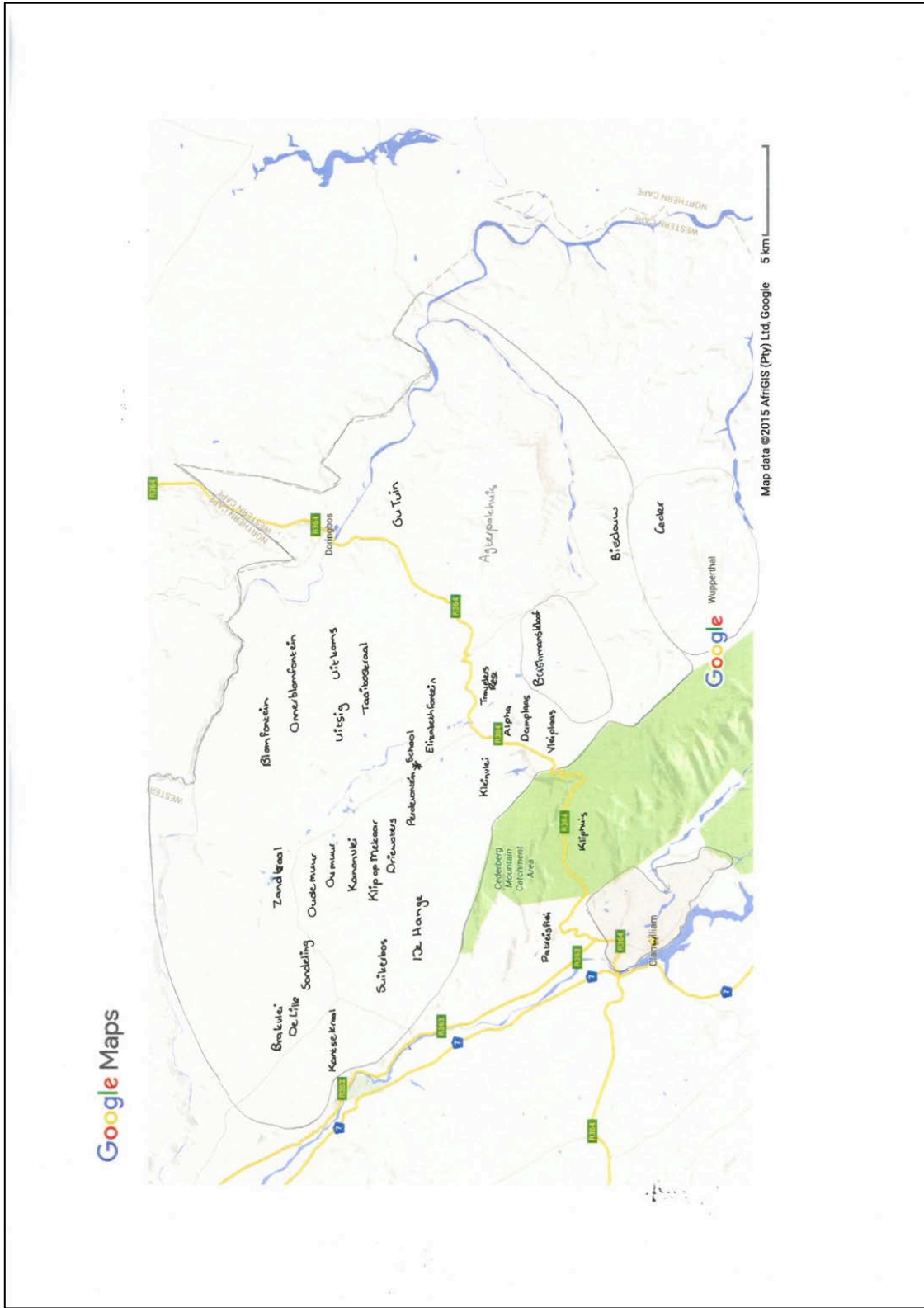


Figure 2.1: The Elizabethfontein Primary School Catchment Area [Source: Adapted from Google Maps]

### i. Clanwilliam Town

Within 10 years of landing at the Cape, Western pioneers explored the Olifants River area, which would later become Clanwilliam (Kotze, 1981, p.1). This inland exploration stemmed from the need to farm and trade to ensure the profitability of the Cape Outpost. Local people known as the Namakwas, Boesmans and Hotnots at the time had inhabited this region for generations and their rock art is still visible today. The descendants of these communities, immigrant slave labour and farmers formed the Coloured community, which encompasses the learners of EFPS. Some of the early encounters between these peoples and the pioneers were fruitful and resulted in trade, whilst others were not (Kotze, 1981, p.4).

The first colonial settlement occurred in 1725 and involved the allocation of farming land between Clanwilliam and the Biedouw River to the north to support the Cape Outpost (Kotze, 1981, p.6). This region (shown in Figure 2.1) covers the catchment area of EFPS. Many of the local people died out during a Smallpox epidemic in 1713 (Potgieter et al., 1970, p. 378). Since the local workforce had been crippled, slaves and other workers were imported to the region, greatly diluting the traditional culture. In 1837 Clanwilliam became an independent district (Kotze, 1981, p.99) and it attained municipal status in 1901.

Religion and the church played a crucial role in the development of the town. In 1820 an English congregation was established, followed by an independent Dutch Reformed (NGK referring to the Afrikaans *Nederlansse Gereformeerde Kerk*) congregation in 1826 (Kotze, 1981, p.17). From 1815 missionaries were sent around Clanwilliam to ensure the labour productivity of the local “coloured” community. Numerous mission stations were established, including Wuppertal (see separate discussion) and Ausburg next to the town (Kotze, 1981, p.67). Here a school for coloured children and a night school for adults were founded in 1846, establishing the coloured community of Clanwilliam. (Kotze, 1981, p.65). The coloured and white communities were integrated at this stage – coloured people were permitted to attend the NGK and the parenthood of 12 children christened within its first month was recorded as “bustard”, or mixed race (Kotze, 1981, p.18).

This integration was stopped in 1895 when coloured individuals were encouraged by the NGK to join the Missionary Church (supported by the white community) instead in an attempt for each community to “stick to their own” (Kotze, 1981, p.68), although coloured individuals were still readily baptised and accepted into the English church. In 1952 the coloured community comprised 60% of the population of Clanwilliam, by 1980 this percentage had grown to 81% (Kotze, 1981, p.103). The welfare of this community received increased attention from 1979, aided by the employment of a social worker and social development projects focusing on alcohol abuse and poverty (Kotze, 1981, p.79). Although laws necessitating segregation of

communities were officially ended in 1994, the town of Clanwilliam still remains racially divided, both geographically and socially.

The Clanwilliam Dam was built in 1931 (Kotze, 1981, p.47), providing irrigation to local farmers and hydroelectric power (Kotze, 1981, p.103). This allowed farming to expand and a Rooibos Tea Governing Body for the industry (the main crop of the region) to be established in 1954, comprising 130 farmers (Kotze, 1981, p.95). Rooibos is only grown in South Africa, and today the Rooibos Ltd factory in Clanwilliam purchases most of the annual crop to export to over 60 countries with an international market share of over 70% (Rooibos Ltd., 2016). This factory is an anchor employer in the town, and as a price setter for the rooibos harvest its influence stretches throughout the district.

Another historical trade in Clanwilliam is leather shoe making. The Strassberger Shoe factory was established in 1954 (Kotze, 1981, p.103) the original Wuppertal factory, from where workers were brought, faced distribution problems. Today the factory is known as the second oldest handmade shoe factory in the country, and prides itself in 80% of production being done by hand (Strassbergers, 2015). As such, it is a substantial employer and skills developer in the town.

Today Clanwilliam faces numerous social and economic challenges. Economic development for the town is based on seven growth factors (IDP Review 2014, p.18): its location along the N7, which connects Cape Town to Namibia; the Clanwilliam dam; its proximity to Wuppertal, which is a unique tourist attraction; Rooibos tea production; the Cederberg wilderness area as a tourist attraction which includes wild flowers and rock art; being the business and administration centre of the area; and having a reasonable educational infrastructure. Potential for wind farming and aqua-farming are being explored in the region. The N7 national road that runs past the town is currently being expanded and elevated, as the Clanwilliam Dam wall will be lifted by 13m to increase the dam's capacity. These projects have resulted in an influx of many temporary labourers to the town that do not have Afrikaans as their home language.

The most recent census data available is for 2011 which was used in the construction of the Integrated Development Plan (IDP) for the region. Clanwilliam is a small town with a population of 7674 (IDP Review, 2014) with 69% coloured, 23% black, 8% white and 1% other whilst 78% of the community identified Afrikaans as their home language, though this has likely changed since 2011 because of the influx of workers for the dam and road renovation projects. The population density in the region has increased drastically over the last 10 years. However, the town's economic growth potential is low, weakened by factors such as high unemployment and joblessness; poor literacy, a low skills base and high levels of poverty; HIV/Aids and high crime levels; the population growing at a faster rate than infrastructure especially water

infrastructure; and dependency on grant funds. The Gini coefficient (indicating the difference between the rich and the poor) of the Cederberg is the highest in the district at 0.64 (IDP Review, 2014, p.213).

Despite changes in the constitution in 1994, Clanwilliam remains a divided town, as shown in Figure 2.2 (showing the racial distribution of the 2011 census (Frith, 2011)). The distinction between the mainly white area and the rest of the town is clearly identifiable. What is also evident is the density of occupation in the coloured (Hopland) and black (Khayelitsha) areas of the town. Figure 2.3 shows unsafe neighbourhoods (high crime occurrence) as identified by EFPS learners and staff (an original example is shown in Figure 2.4). These sights include areas where illegal sales of alcohol and drugs especially “Tik” (methamphetamine) take place. When the sites identified in Figure 2.3 are compared to the racial and density distributions in Figure 2.2 a pattern emerges – the high crime sites occur in the high-density coloured and black areas. Learners at EFPS are aware of these unsafe neighbourhoods, as this is where many of them live.

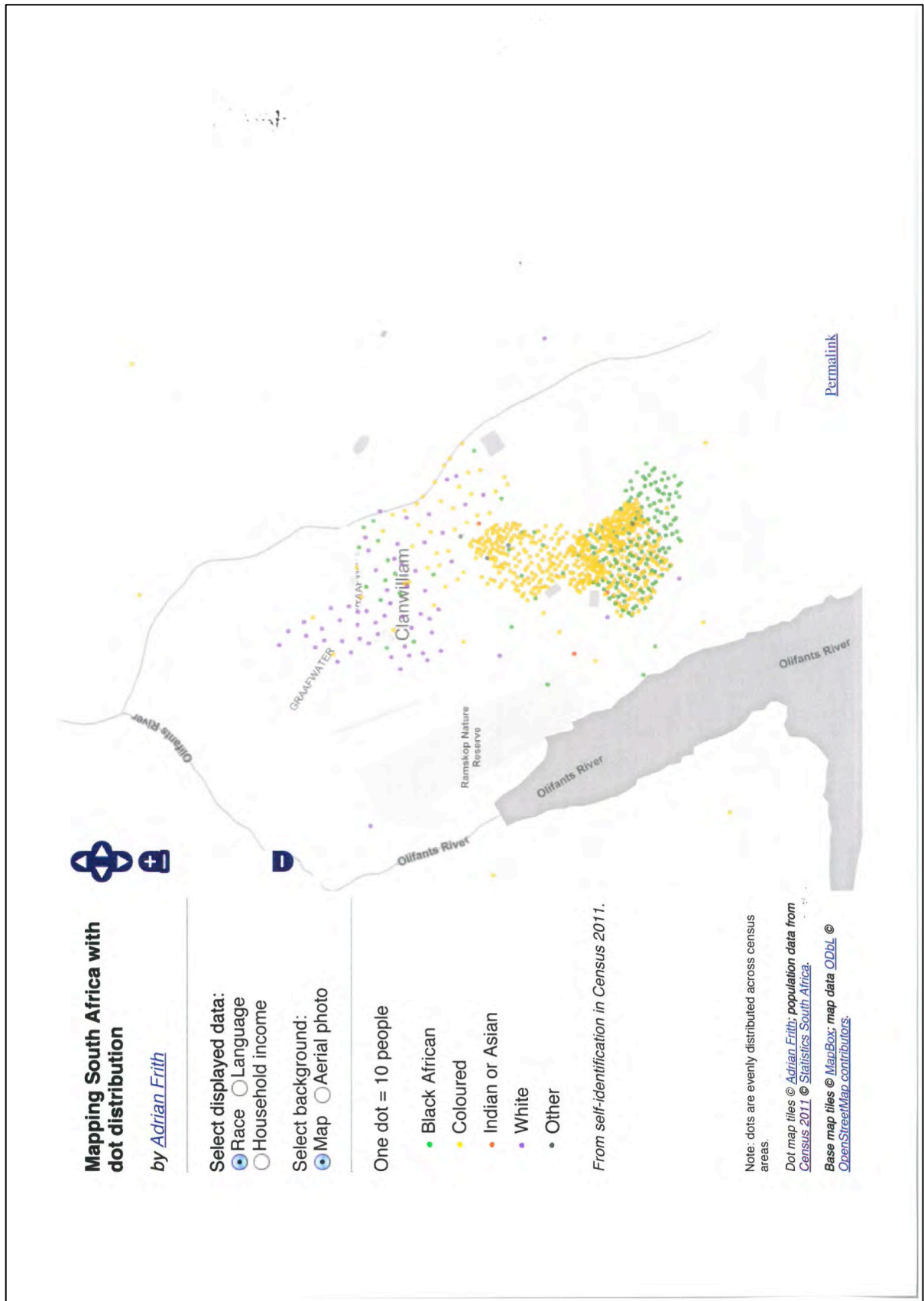


Figure 2.2: Racial Distribution of Clanwilliam in 2011 [Source: Frith 2011]

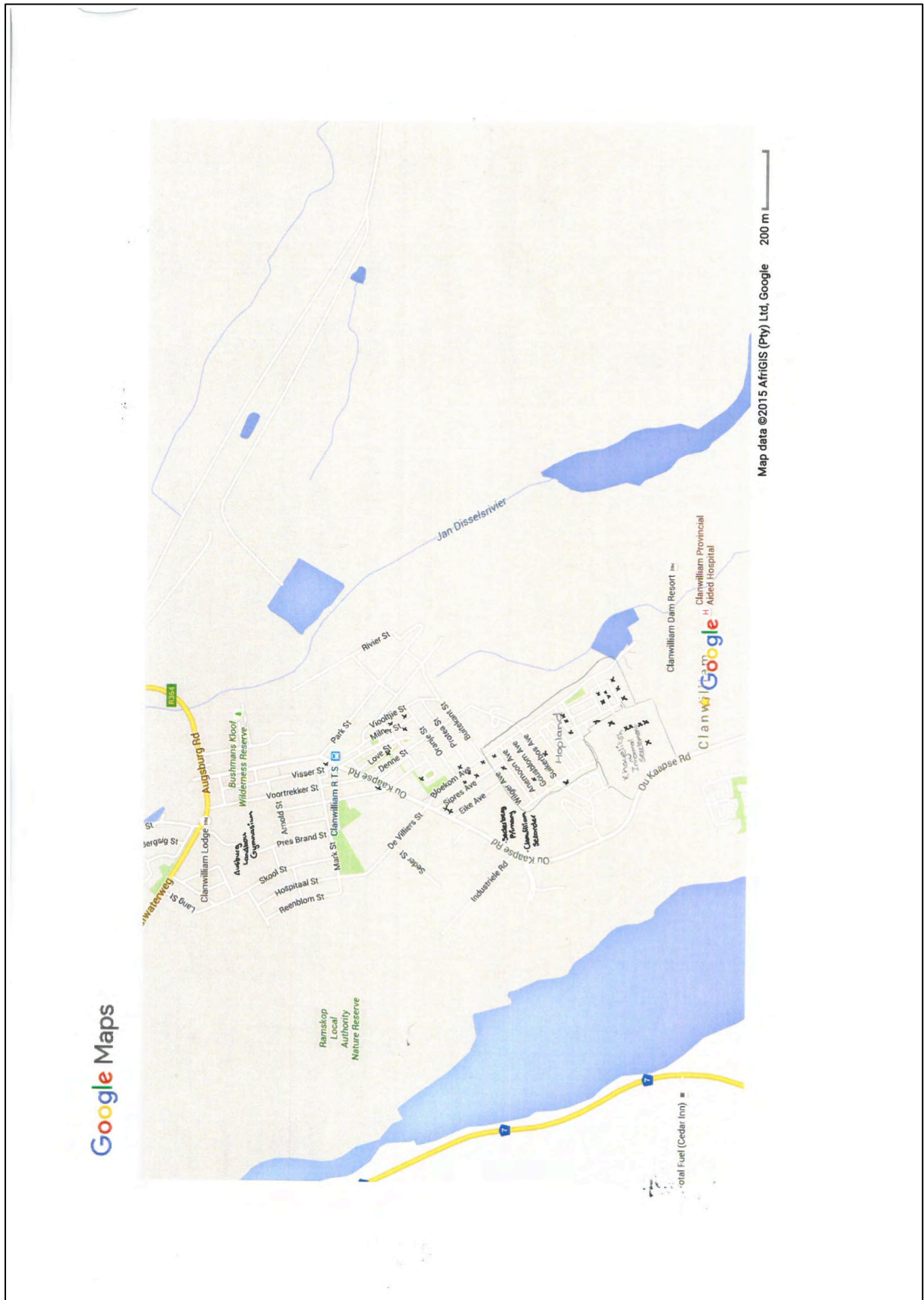


Figure 2.3: Map of Clanwilliam Showing Sights of Danger (denoted by x) [Source: Adapted from Google Maps]





*Figure 2.5: The Harvesting of Rooibos Tea*



*Figure 2.6: House of a Farm Worker*

Access to farms is mainly in the form of dirt roads and cellphone reception is limited, largely cutting residents off from the outside community. The inaccessibility of this region, discrimination and victimisation of farm dwellers, dismissal and threats of eviction because of new minimum wages are real challenges (IDP Review, 2014, p.38). The government is focusing on tarring gravel roads and implementing a rural transport system to increased access in this area (IDP Review, 2014, p.87).

The main connection between the farmworkers and the town has always been the traveling salesman (Kotze 1981, p.13). Wages are paid weekly, with Friday being

pay-day. The “dop system” (discussed in Chapter 3), although outlawed, still has an effect on this community, as Micheale\* (now 25) describes when she remembers her father receiving a bottle of wine when he clocked out on a Friday. Today tradesmen fill bakkies (small pickup trucks) with alcohol and other goods on a Friday to sell from farm to farm. Illegal homemade alcohol is also brewed and sold for a profit. This is very dangerous as there is no control over the concentration of alcohol in the brew sold this way. Alcohol usually takes the form of 5l bottles (figure 2.7) of sweet, cheap wine that sells for R75 in town. Four or more people usually consume a whole bottle, drinking from mugs, over the course of a weekend afternoon, often in view of learners.



*Figure 2.7: 5L Bottle of Alcohol*

### **iii. Bushmans Kloof**

Bushmans Kloof Wilderness Reserve is a luxury, 5-star lodge about 6km from EFPS. The Reserve covers a preservation area of 75km<sup>2</sup> and caters for an exclusive, largely international clientele (Bushmans Kloof, 2015). It was established in 1991 and has since had a resounding impact on the Agterpakhuis region. The road over the Pakhuis Pass up to Bushmans Kloof has been tarred and the lodge brings international guests, money and publicity to the area.

The lodge employees live on the premises in designated housing. Their children attend EFPS where they are weekly boarders. Unlike most other learners, the school fees for these children are paid in full by the resort and weekly transport is arranged. In the employees' "village" children have access to a small library, internet and a community hall. Their parents are employed in various capacities at the resort, as cooks, cleaners, and farm workers, giving them exposure to specialised skills and international guests and helping to broaden children's horizons. There are however a number of families who do not have Afrikaans as a home language, which is a challenge for the school and these learners.

Riel dance (the traditional dance which originated from the Khoi and San people) has also been placed on the global map under the guidance of the chef (a keen ballet dancer himself) at the lodge. He led the team of dancers from Wuppertal to international acclaim when they won Gold, representing South Africa at the World Championships of Performing Arts in Los Angeles in 2015 (Bushmans Kloof, 2015). This allowed them to travel internationally and some were awarded scholarships to American dance schools. The EFPS Riel dance team has also benefited from the international recognition of this dance form.

Visitors to the lodge can also tour EFPS, where they sometimes hand out gifts and stationary to the learners. Through one such excursion a family from England established a link between EFPS and Goostery Primary School in rural England. Since then this relationship has flourished, not only in the form of funds and gifts sent to the learners, but also with EFPS learners visiting the school in England.

Bushmans Kloof offers support, bursaries and other benefits to their workers, which may have to be scaled down due to the current South African economic climate.

#### **iv. Wuppertal**

Wuppertal is a missionary settlement at the South-eastern edge of the EFPS catchment area. It was established in 1829 when the Ryns Missionary Partnership in Holland sent a team to this desolate area (Kotze, 1981, p.66). The mission station later became part of the Moravian Church, which still governs the community. The emphasis since inception was not only on building a community, but also improving the living standards and labour productivity of the local community. Historically the activities of the town have included: Gardening; herding; hat making; woodwork; taxidermy; and shoe making. Unfortunately, many of the cedar trees in the area were harvested to make furniture and telephone poles (IDP Review, 2014, p.195). Development aid from government and church organisations has been given to the Wuppertal mission since 1995 in the form of grants, interest free loans and donations.

All buildings in the town are in the old Cape Dutch style with white walls and thatched roofs (figure 2.8) with the church still forming the centre of village life. It is an isolated village that can only be reached by gravel roads from the north and south, both encompassing dangerously steep, sometimes unpassable, mountain passes, completely cutting the community off in bad weather. As locals usually travel by donkey cart they rarely interact with the outside world. Provincial government's attempts to improve the bridge at the centre of town is limited by funding constraints (IDP Review, 2015, p.37) Today most of the 8600 inhabitants live off subsistence farming, renting a plot of land from the church on which a house is built and small-scale agriculture takes place. Excess produce are bartered amongst the inhabitants and a small shop operated by the church provides that which is not grown. No alcohol is sold.



*Figure 2.8: Wuppertal – a main road in the town with houses on the right and subsistence farming on the left*

There is a perception that the church exerts too much control over the lives of village people. Young people also leave the town for better economic opportunities, but many return home because of the low cost of living. Although external money enters the town through the shoe factory (the oldest hand made leather shoes in the country), handmade soap production, and tourists during the flower season (especially doing the 4x4 routes), Wuppertal gives the impression of being “lost in time”. The town has a zero percent economic growth prospect (IDP Review, 2014, p.21). There is no cell phone reception in the area, though an Internet hub with Wi-Fi has been erected in the middle of the town. The town has no hospital, public toilets, police station, petrol station or fire station and is heavily dependent on Clanwilliam for these services. A small school offers education up to Grade 9, after which learners have to go to Clanwilliam to continue their education. Some parents

have, however, opted to educate their children at EFPS in order to ensure outside exposure. This isolated community would offer an interesting case study in itself.

### **b. The School System**

The development of schooling in this region is split between that for white children and that for coloured children (dependant on missionary outreach). White children were tutored at home from as early as 1775 where they learnt basic reading and writing aimed towards a Christian education (Kotze, 1981, p.14). Although the British colonialists earmarked education as important in 1803, the white Afrikaans community felt little connection with or sympathy for such a foreign system. The fact that the school in the town fell under complete control of the English Church was a point of contention for the NGK community, who established their own preparatory school in 1827. The same year the English Public School was established. Another independent Afrikaans church school was established in 1873, which was combined with the public school in 1905 from which an agricultural school branched off from 1928 to 1996 (Ausburg Landbougynasium, 2015). Today Ausburg Landbougynasium is a combined school from Grade R to Grade 12 with 506 learners (an average of 39 learners per grade). It is the most prominent school in town, with two well-kept campuses where many town events are held. Although race is no longer a criteria for attendance, it is the school of choice for white learners and costs on average R8400 per learner annually (WCED Find-a-School, 2015).

Education of the coloured community has its roots in a missionary school to educate coloured children and adults, operating from 1846 - 1880 on a farm outside the town (Kotze, 1981, p.167). This later became the NGK mission school in town, which merged with the English missionschool to become Sederberg Primer in 1963 (Kotze, 1981, p.70), and has since been extended to Clanwilliam Sêkonder. Today Sederberg Primary offers Grade R to Grade 7 to 1163 learners (an average of 145 learners per grade) and Clanwilliam Sêkonder offers Grade 8 to Grade 12 to 544 learners (an average of 109 learners per grade). Both are no-fee schools.

Farm schools were established from 1936 (Kotze, 1981, p.69), the first being on Pakhuis Paas, which later moved to Elizabethfontein and became EFPS which today is a no-fee school offering Grade R to Grade 7 to 262 learners (an average of 33 learners per grade). The two remaining farm schools in the region are very small. Dwarsrivier Primary is a no-fee school offering Grade 1 to Grade 6 to 13 learners (an average of 2 learners per grade in combined classes) and Wuppertal Moravian Primary School, which offers Grade R to Grade 9 and is run by the Moravian Church.

Improvement of education outcomes is emphasised by South Africa's 2012 National Development Plan and a concern of the provincial government (IDP Review, 2014, p.11). School enrolment has increased but the Cederburg Municipality had the highest school dropout rate in the West Coast district at 41.6% in 2011. Educational

attainment is not promising, with 7.7% of the Cederburg population having no schooling (though this dropped from 12.2% in 2001) and only 5.1% attaining matric (down from 5.7% in 2001).

## Chapter 3: Alcohol and the Home

Children with fetal alcohol syndrome (FAS) are conceived in intoxication, carried in intoxication and born into intoxication. Even if a child does not have FAS, alcohol has played a big role in their life. Alcohol abuse is rife in the coloured community, though data for Clanwilliam is not available as there is no rehabilitation centre, from where most alcohol and drug data in South Africa is attained. This chapter describes the influence of alcohol on children's home environment, which forms the backdrop from which they enter school. First the history of alcohol in the area is briefly discussed, followed by a description of the EFPS learners' home contexts.

### a. History of Alcohol

The original Khoi inhabitants of the Western Cape did not produce their own alcohol (Scully, 1992, p.56) but were employed by white farmers who paid them in tobacco, bread and wine from the 1680's. The "Dop" system originated because wine farmers, not having enough cash to pay for labour, used surplus wine as payment. The name "Dop" stems from the Afrikaans word for a tot of alcohol and involves paying for labour in alcohol. Workers were also motivated to ensure adequate production of wine, aligning with the incentives of the farmer. Later non-wine farms started the practice in order to compete for labourers, which could account for high alcohol use even among farmworkers not employed in wine farms. In the 1870's there was a shortage of farm labour because of the smallpox epidemic, resulting in an increase in the Dop size, sometimes necessitating the purchase of additional wine to give as Dop. Alcohol dependence was by-product of this system. The Labour Commission of 1893 acknowledged the dominance of the farmer over workers through this system, as alcohol dependency ensured that workers were prepared to work under harsh conditions in order to support their habit (Scully, 1992, p.68).

Alcohol was brought into the Clanwilliam area with the pioneers and its negative influence is recorded as early as 1833 with the dismissal of a local teacher because of alcohol abuse (Kotze, 1981, p.79). The dangers of alcohol abuse were of concern, especially since coloured workers were permitted to purchase up to 6 bottles at a time in 1884.

Farm labour was demanding and repressive, making alcohol an understandable coping mechanism (Scully, 1992, p.57). Wine was given as payment to children as young as 12. Alcohol was part of the daily routine, the sharing of which created a social time, which the farmer did not share in. Since labourers were dependant on the farmer for housing, work and other compensation this small autonomy was highly valued. This social aspect of alcohol and the unity it created still resonates on the farms today.

From 1885 farmers were permitted to sell liquor on their premises. Labourers often become indebted to alcohol salesmen and farmers to attain wine (Scully, 1992, p.63),

tying labourers into a debt cycle that ensured future service. If workers absorbed their wages rapidly through alcohol consumption they also needed to work more and could not save. Those farms that produced alcohol also ensured a market for their produce. In the late 19<sup>th</sup> century wage advances (paying for next season's work in advance) were common. This ensured that the labour was available when it was most needed, such as in the planting and harvesting seasons.

Sale of wine to the coloured community was so important to the livelihood of wine farmers that the Dop System, though no longer legal, was still in use in recent years as shown by Michaela, who is 25, who can still remember her father being given a bottle of wine when he clocked out on a Friday. The lasting legacy of the dop system endures with her father, though no longer receiving payment in alcohol, purchasing wine every Friday in keeping with the habit. Dop ensured short-term labour, but had a long-term effect on labour productivity and the social context of labourers. Not only were alcoholic labourers less productive, but generations of FAS children also became labourers, who could not perform as required. The repercussions of this system still ripple through the community.

#### **b. Alcohol at Home**

On the farms and in town most wages are paid weekly. There is very little to do over weekends in town and on the farms. This means that alcohol consumption takes place mainly over weekends, often in binge episodes exacerbated over the weekends on which government grants (AllPay) are paid. This is of concern since Streissguth et al (1993, p.1) find that binge drinking has more serious effects on an unborn baby's development than consistent drinking, even if the same amount is consumed over time.

Alcohol reaches the farms through three channels: Personal purchases in town; bulk purchases in town and resale on the farms; and home brewing of alcohol on farms. Some workers living on the farms and those living in town purchase their own alcohol at the many liquor outlets available, as well as from illegal outlets (see figure 2.3 for a map of illegal activity in town). Drivers must be careful over weekends because of the large number of drunken pedestrians. Shops have long lines and ATM machines are empty. The original (Apartheid-era) coloured area of town (Hopland) is very noisy with many people drinking on the street. Many farm workers do not have their own transport and rely on merchants who go to town on a Friday and bring back goods and alcohol for sale on the farms. Communities then get together to "relax with a drink". Homemade alcohol such as alcoholic ginger beer is also sold. This is particularly dangerous since there is no control over the concentration of alcohol in home-brew.

The extensive use of alcohol has become a "way of living" for many. On a Saturday afternoon farmworkers can be seen gathering together drinking. By 4pm men and

women are visibly drunk with the smell of alcohol on their breath. Fathers admit that though they do not have money for their children, they have money for their drink, which shows acceptance of some responsibility for the problem, but not any active will to change it. Alcohol is used as an escape from boredom and circumstances. The children are part of the drinking circle, with stories of a 4 year old drinking and 9 year olds coming to school drunk after a weekend. Some children are breastfed until as old as 5, so a mother's drinking may still influence them. Other children get visibly scared when people are drinking, since this is often coupled with violence especially against women and children for small transgressions such as teasing or making too much noise.

### **c. Unsupervised Children**

Alcohol consumption usually takes place in the pub in town or at home as an important part of social lives because of the lack of other night-time activities (Jayne et al, 2011, p.36). In Clanwilliam the main pub also offers gambling slots. Older teenagers are not permitted into pubs legally, and are therefore forced to socialise at home, which often involves alcohol and gives rise to other risky activities such as underage sex. The lack of transport also restricts the movement of this age group and forces them to walk home when intoxicated. Underage drinking is accepted by the community and often encouraged by parents, as that was what they did when they were young.

Children are exposed to this drinking from a young age. The wide range of social and biological events that take place in a household governed by alcohol addiction influences the social and emotional development of a child (Howard & Beckwith, 1997, p.396). Alcohol addiction has an impact on other aspects of home life including caring for ones child, especially over weekends when binge drinking takes place. Children are largely unsupervised over weekends, roaming the streets in town, climbing trees and jumping on a rusted corrugated iron roof as one would a trampoline. Some children are given nothing but sugar water over the weekend. When they arrive at school on a Sunday children are often uncared for with dirty clothes from the previous week and without supplies or necessary clothing such as school shoes or a jersey in winter. The physical and emotional well being of children is neglected, for example, a Grade 5 girl arrived at school with an infected ear covered in pus that had not been cleaned. School gives them structure and security.

Most parents who abuse alcohol are themselves from difficult family backgrounds and find it difficult to be nurturing (Howard & Beckwith, 1997, p.405). They often do not regard the education of their children as a high priority as shown by Alex\*, a ten year old boy, being absent from school repeatedly, becoming known for only attending every second week. EFPS's catchment area borders on the Northern Cape (which falls under a different Provincial Government) where his mother lived in horrific circumstances. The school reported suspected child neglect since he was

very small for his age, had no shoes and little clothes, was always hungry and was known for walking to the Northern Cape by himself. When authorities did an inspection of his home they found old animal blood and guts on the floor, and the children neglected and dirty. However, since the school is in the Western Cape and they live in the Northern Cape the case was never pursued. Alex was very far behind for his grade, but had been progressed because of the restriction on how many times a child may repeat within a phase (see chapter 4). Around March 2015 Alex disappeared, with no one knowing where to look for him and no contact possible with his mother. Six months later there were unconfirmed rumours of his mother arriving at another farm, pregnant and begging with her two boys. This may not be true and the school does not expect to see Alex again.

Children of alcoholic parents are often abandoned or put up for adoption (Howard & Beckwith, 1997, p.399). There is no children's home in Clanwilliam, and social services labour under a large backlog. Some children are, however, adopted and looked after by the community. Removal from a household effected by alcohol can help a child break out of the cycle of poverty, as is shown by Michaela's story. Born to a farm labourer and his wife in 1990 she grew up attending EFPS with her twin brother. Their mother, who had always shielded them from her father's drinking, passed away when they were 9. Their father's drinking spiralled out of control, prompting an aunt to take them in. Michaela worked hard in school attain a scholarship to Ausberg Landbou Gymnasium for high school, where she was a term boarder. Her twin brother, on the other hand, left school at 15 and returned to their father's house. He is now a farm labourer himself and an alcoholic. Michaela completed Matric with a Bachelor's Pass, completed a Certificate in Office Administration and is currently studying towards a degree through UNISA. She attributes her ability to break out of the poverty cycle to the fact that she was removed from the toxic home environment through living with her aunt and in the boarding house without having to return home over weekends. Attending Ausburg also exposed her to peers who stretched her horizons further than the farms and gave her the confidence to pursue her ambitions.

At EFPS boarding is only available during the week, and learners are forced to return to difficult home circumstances every weekend. At home children are exposed to physical, emotional and sexual abuse. For example, Kyle\* (Grade 4) came to school with big bruises on this back from being beaten by his adoptive family as he was expected to work for his lodging. This was reported, but authorities did not respond. Simone\*, a Grade 4 girl, reported her mother's boyfriend for molesting and raping her. He was arrested, but released on bail to the house where she returned every weekend. Her mother was angry that he was reported since he was the only breadwinner in the family. If he is convicted there will be no money apart from AllPay in the house.

Children are exposed to sex at an early age. Houses are small and families often share one bed. Parents will have sex whilst sharing a room or even a bed with their child. Grade 1 learners dance with pelvic thrusts and sensual movements. Girls are viewed as “sexually ripe” as soon as they reach puberty and are approached by men who threaten to use force if they do not agree to sexual relations. Reports of older men having relationships with these young girls are not considered out of the ordinary.

Rates of teenage pregnancy are very high in the community with the number of babies delivered by under 18's in the Cederberg Municipality increasing by 41% from the previous census (IDP Review, 2014, p.211). A Grade 6 girl at EFPS (aged 15) fell pregnant in 2015 and even going to England on a school tour, which was hoped to expand her horizons, did not break the trend of teenage pregnancy as touring learners fell pregnant themselves. The clinic in town and the hospital provide free contraception, but there is an expectation of judgement when accessing these. Termination of pregnancy is taboo. Unplanned pregnancies also contribute to the risk of fetal alcohol syndrome (Streissguth et al., 2004, p.230).

Evidently, alcohol plays a very big role in the lives of the children in this area. As such, every child's learning is likely to be effected. These born with FAS carry a specific the physical burden of this alcohol misuse, but all children growing up in this environment will suffer the effects. Therefore, as school such as Elizabethfontein faces more challenges than just educating FAS children.

## Chapter 4: The School Context

This Case Study takes place at Elizabethfontein Primary School (EFPS), a small primary school in the Cedarburg. It is a farm school that was established in 1936 on the Pakhuis pass (Kotze, 1981, p.70), which later moved to the current location 35km outside the town of Clanwilliam. In 1966 it was closed because of a lack of pupils, but the local community and missionaries insisted upon the continuation of learning at the school. The old school building burnt down in 1974, prompting the headmaster to continue lessons at his house during building reconstruction. This shows that from the start learners were at the heart of operations at EFPS. This chapter describes information gained during a 6-month stay at the school, through informal interviews and observations.

### a. Elizabethfontein Primary School

In 2015 EFPS offered schooling from Grade R to Grade 7 to 262 learners, 132 males and 127 females. 173 (66%) of these learners live in the boarding house. There are 25 members of staff. The school's mission statement is: "Everything in the interest of the child", encouraging learners to achieve their full potential and "Reach for the Stars". The school values of love, respect, kindness and honesty, are on display throughout the school, form the foundation of learning and can even be recited by Grade R learners.

School starts at different times during summer and winter because of the extreme summer temperatures, often reaching over 40 degrees Celsius. In summer learners get picked up in town at 6:45 and school starts at 7:30. Grade R, 1 and 2 learners finish at 12:00, Grade 3 at 12:45 and the rest at 14:00. The busses go back to town at 14:30. In winter the schedule is moved 15 minutes later to cater for the sun rising later.

Chalkboards on the outer walls of classrooms create a cheerful learning environment and allow learning to be continued after hours. The school jungle gyms have been painted in bright colours, and there is an indigenous garden at the entrance to the school. Replicas of rock paintings on the school wall meet visitors driving down the dirt road. The school is immaculately kept. Learners are encouraged to pick up after themselves, help clean classrooms and help out in the gardens. Everyone takes pride in the school.

During a regional athletics meeting in a neighbouring town (where those learners who had performed well at the inter-house athletics participated) this "Betjies Spirit" was particularly evident. Since EFPS learners had only trained on a dirt road, barefoot, and do not have access to equipment they do not generally perform well. Some of the local pupils helping at events did not return after lunch. One of the EFPS learners, Kyle\*, filled in with energy and enthusiasm that impressed everyone including teachers from other schools. He was given a certificate of excellence from

EFPS for his help, which was particularly meaningful since he struggles at school and has a very difficult home environment.

The positive influence EFPS has is illustrated by an ex-parent's recount of her son turning his life around after moving there. He was having considerable difficulty in the town's school and his physiotherapist suggested moving him somewhere smaller. His work and demeanour turned around within two months, so much so that he was accepted to West Coast Vocational Training College allowing him to make a living for himself. The school administration often employs ex-learners with learning difficulties and FAS.

### **b. Boarding**

Two thirds (66%) of the pupils at EFPS are weekly boarders. A number of large dormitories house girls and boys separately, but because of the expansive geographical region (Chapter 2) and the safe haven offered demand is high, requiring children to often share a bed. Learners are fetched from the farms and town on Sunday evenings and transported home on Friday afternoons; this is usually the responsibility of the school, not the parents. Eight "Koshuis Tannies" and a matron (all female) care for the children, including supervising their homework, ensuring children are washed (in communal showers), and preparing supper. This is a trying task with almost 20 children per Tannie, some of whom are also responsible for cooking and general cleaning. At night children have to be locked into the dormitories because there is no perimeter fence and pupils are known to get up to mischief such as vandalising the property. Tannies live in the room with the children and often have no more privacy than a cupboard separating their bed from the rest.

Early in 2015 EFPS appeared in the news because of the lack of adequate sleeping arrangements (Fredericks, 2015). The report claimed that pupils were sleeping on mattresses on the floor and transport was not available for all pupils living in town. Because of this two Wendy houses were purchased and constructed, financed by numerous fundraising and sponsorships. The new Wendy houses, whilst providing more space, are not well insulated, and are very hot in summer and cold in winter.

Demand for boarding is heightened by the large catchment area of the school (see Chapter 2) as well as the school's specific attention to every child. Most learners from Grade 5 to Grade 7 are required to board because of the lack of transport available and the risk of these learners engaging in risky behaviour such as sex, taking drugs and drinking. Many learners in the younger grades are also required to board because of their home environments. The teachers know the background of every learner, their home and their parents. Any child who is known to be absent often, come to school hungry or has neglecting parents is required to board. Many parents are young themselves, meaning that they do not know how to look after young children. Two generations of children can pass through the school within 20 years. A

specific meeting is held at the beginning of the school year to discuss which pupils are “at risk”. These decisions are periodically reviewed. Unlike their homes, boarding offers supervision, structure and food, although this is only available during the week.

All learners who struggle academically are earmarked for intervention at the beginning of the school year. Teaching assistants use two methods of intervention: In-class assistance (Grade 2 and 3); and formation of a separate class (Grade 1 and 4). Separate classes, though providing personal attention, take place in the hall and a storehouse. It is unclear whether these learners catch up to their classmates or continue to be left behind.

### **c. School Feeding Scheme**

Since EFPS is classified as a Quintile 1 school it forms part of the National School Nutrition Programme. According to the Education Policy (2015) this scheme aims to increase education quality by: Enhancing active learning capacity; relieving short-term hunger; incentivising children to attend school regularly and promptly; and compensating for micro-nutrient shortages. The scheme was introduced in 2002 and aims to feed children from Grade R to Grade 7. Minimal food is provided, necessitating the supplementation by the school.

EFPS relies heavily on this scheme to feed the learners, but it also has a vegetable garden where seasonal vegetables such as sweet potatoes are grown, despite the sandy soil and lack of water. In 2015 the school received an award for the best semi-arid school garden. They plan to use the money from the award to erect greenhouses so that fruit can also be grown.

The school day starts with breakfast of mealie pap (maize porridge), which is reinforced with micronutrients, offered to everyone, and many day learners also participate. At first break, 10am in summer, all boarders are given sandwiches and sometimes a fruit or raisins. Day learners are expected to bring a packed lunch, though this often does not happen and they must go hungry. The handing out of sandwiches is often chaotic, as learners fear that they will not get their share. After school everyone is entitled to a hot lunch. This usually consists of tinned fish, soya mince and white corn (samp). Eating has to take place in two sessions, as the dining room (which doubles as a classroom and teachers lounge) cannot accommodate everyone. The Koshuis Tannies go to a lot of trouble to convert the basic ingredients provided into something appetising. Dinner for the boarders is a special meal, requiring considerable effort and preparation, and usually contains some form of meat such as chicken.

Many learners bring pocket money to buy treats at the tuck shop run at second break, where cheap sweets (for 20c each) and chips (for R1 a packet) are sold. Those

who live on the farms do not go to town often, making this one of their only opportunities to get sweets. Some learners ask teachers to buy them chocolates and other sweets in town, but often do not have enough money to afford their desired goods. The tuck shop is particularly busy on a Monday (for learners to buy supplies for the week) and a Thursday (for weekend supplies). Since there are no lockers money and treats often go missing in the boarding house.

#### **d. Parental Involvement**

Theoretically, parents should be the main stakeholders of a school and thus hold it accountable for the education of their children. Officially this is done through the School Governing Body (SGB), which must serve the best interests of the school and ensure the development of quality education (WCED, 2006). The SGB must consist of: Seven parents who are not employed by the school; two educators; one non-educator staff member; the principal; the owner of the property; and other experts from the community. At EFPS the SGB elections are held at the beginning of the school year, under strict guidance from the department. Some parents, however, felt unhappy that only one representative came from the farming community, the rest from town. The school later employed the head of the SGB who is also married to a teacher, which raises a conflict of interest.

Holding a small concert, having food on sale and inviting guest speakers encourage parental attendance of elections and other parent evenings. Transport is a challenge. Those parents from town can buy a lift in the school bus for R20 and some farm owners, such as Busmanskloof, organise transport. The majority of parents, however, are not able to attend. This can cause bias in procedures, especially in favour of town-based parents. Efforts are made for staff to visit at least one farming area per year.

When I visited the farms independently parents raised concerns that the interests of farm children are not the main focus of the school anymore. They felt that since there is a school in town EFPS should focus on their children. Children who live on distant farms have to be in the boarding house from Grade R (whereas towns children are transported daily), adding to the hesitation to send children to Grade R. The feeling of exclusion extends to mistrust in bursary systems, with parents feeling that farm children are passed over in favour of the town's children for high school bursaries.

#### **e. Extracurricular Activities**

Part of the appeal of EFPS over other schools in the community is its emphasis on extracurricular activities, including Riel dancing, for which the area is known, to ensure well-rounded learners. Betjies Riel Dance Team participate in national competitions, have won numerous awards, perform all over South Africa and on national television, and have toured to England. This dancing is a major source of fund raising for the school. Since the majority of staff members have governing body

posts their incentives are more aligned towards dancing than teaching (refer to point f.i below).

Apart from Riel dancing, learners also take part in other dance forms and choir on a regular basis. The school day includes a designated time for these activities between the end of school and when the busses leave. However, practices occur throughout the day closer to events. It is difficult to find a time during the term when there are no events. Over the course of 7 months the school had: An Afrikaans entertainer performing in the first term; two sports days; an athletics day; a school concert; a performance for international guests; a visit by a group from America; a visit by a group from Diocesan Collage (Bishops) in Cape Town; two school camps to Cape Town; choir festivals; sole buddy events; a drumming workshop; weekly drama lessons; a school carnival; numerous dance competitions including at Artscape in Cape Town; parent concerts; and the ATKV Riel competition.

These events expose learners to a wider education than pure academic work, but require a large amount of time. Most performances take place in Cape Town, requiring three hours drive and up to 5 members of staff in attendance, leaving classes to be supervised by teaching assistants or to be combined. The result is that little learning can take place. In the run up to events learners and teachers are also pulled out of class to practice, requiring teachers to leave classes unattended. Such disruptions also take place during exams, when other assignments also have to be completed. As a result academics are often put second and teaching is up to two weeks behind at any time. The academic staff members (most of whom have departmental posts and are therefore not reliant on fundraising for their salaries) raised concerns about the low priority placed on academic work at the school.

#### **f. Challenges faced by the school**

The environment children come from and specific situations give rise to numerous challenges that the school must continuously face.

##### **i. Financial Challenges**

There are 25 members of staff: 9 permanent teachers, a secretary and a matron are paid for by the education department; 5 teachers and 8 boarding staff and a groundsman are paid for by the School Governing Body. Thus the governing body remunerates 56% of the staff. Government pays R17 per day per child for their education. Children often arrive at school without books and pens, which the school provides. The Clanwilliam municipality collects money to buy uniforms for pupils. Officially it is a no-fee school based on the average income of parents, but the school requests R80 per month from parents to cover costs of transport and boarding. This contribution has not been increased since 2013. In 2014 the school should have received R287 700 parental contribution, but only received R162 611 (56,5%).

Shortages in the budget are made up through fundraisers, especially Riel Dancing events.

Since the majority of the staff members have governing body posts, they have an incentive to shift focus from teaching to fundraising. This results in teaching time being used for dance practice and classes, and tests and exams being interrupted to participate in activities such as performances for guests. There is also conflict between those members of staff focusing on teaching, who generally have government posts, and those focusing on fundraising, which causes division among the staff.

The school is built on private property previously designated as a school but now owned by a local farmer. It still consists of a number of prefabricated classrooms, as the government does not pay for construction and maintenance on private property. These classrooms have air conditioning, as without it no learning would take place in the heat of summer, which often reaches over 40 degrees Celsius. Expansion of air conditioning to the boarding house was financed through fundraising and sponsorships.

## **ii. Transport**

According to the Western Cape Education Department Policy on Learner Transport Schemes (WCED, 2013) the department recognises the challenge posed by lack of transport for rural learners. They aim to provide transport to learners living more than 5km from the nearest public school if there is no public transport available. Many farm children attending EFPS fall outside this 5km radius (see Chapter 2), and would therefore qualify for government transport. However, no departmental bus service is available.

Learners traveling from Clanwilliam, which has its own school, do not qualify for government transport. The school has two mini buses and a pickup truck that transports staff and pupils daily, but these are over full. Some of the town's children have to stay in the equally full boarding house. Two trips must be made to town on a Friday, requiring the first busses to leave school at 11:00, meaning that very little schooling takes place on that day.

Most children who live on the farms also board. The school buses, pickup truck and some farm owners bring the learners through on a Sunday evening. They are picked up at different times on a Friday, but everyone has left school by 3pm. Some learners, especially those living on the same farms as teachers, are transported daily. The government pays remuneration for this transport.

The transportation of pupils, especially on a Sunday, is a point of contention among staff. A Public Drivers Permit (PDP) is required to transport learners, and only a small number of staff members who have this permit. They are continuously relied upon to do the driving, which can take up to two hours of uncompensated time. Upkeep of the buses and petrol are not covered by the government and must be funded by parental contributions and fundraising. Vehicles are overloaded and no seatbelts can be worn.

Transportation to the farms only drops children at certain points, and they have to climb through barbed wire fences and walk across fields to get home (figure 4.1). The modes of transport are also not always suitable, for example Michaela remembers sitting on the back of a flat bed truck with no railing holding on to the side while it sped down a dirt road. A girl from the town's school caught a lift on the back of a tractor that was pulling a plough. She fell off and sustained serious injury from the blades. She did not survive.



*Figure 4.1: Children Walking Home from the Bus Drop*

When the learners are in junior school farmers and the school make the effort to ensure they are transported to school. This does not happen once the child reaches high school, which usually only offers weekly boarding. A talented Grade 7 pupil, who was accepted into high school, wrote the poem at the start of this thesis. However, he only attended for a couple of months before the effort of finding weekly transport became too much. He is now a labourer on the farm where he grew up. When possible, the EFPS buses returning to town on a Sunday evening offer a lift to farm children attending high school, but not everyone can be accommodated.

### iii. Children Repeating

Schooling in South Africa is divided into four phases: A foundation phase (Grade 1 to Grade 3); intermediary phase (Grade 4 to Grade 6); senior phase (Grade 7 to Grade 9); and a further education and training phase (Grade 10 to Grade 12). Most learners at EFPS are older than the average age for their grade. Learners proceed to the next grade through two channels: promotion (passing) and progression (moved on because they have been in the phase for too long). According to the WCED (2015) learners are promoted to the next grade if they achieve more than 50% for Home Language, 40% for First Additional Language, and 40% for Mathematics. However, they may not spend more than 4 years in a phase, necessitating learners who do not meet this requirement to be progressed to the next grade, where their lack of performance must be addressed through interventions. If a child enters Grade 1 with FAS, and is unable to perform they can repeat, but if they have not caught up or do not grasp new work they can only repeat again in Grade 4. Consequently learners are progressed and may reach school leaving age by the time they are in Grade 5 or 6. 40% of Grade 1 learners are the correct age, 42% of Grade 2 learners, 27% of Grade 3 learners and 18% of Grade 4 learners. Grade 4 also experiences a bottleneck with 18% of learners being 3 years too old for the grade. This means that there are 10 year olds and 13 year olds in the same classroom, which is very challenging for the teacher.

Because learners are older than expected in junior school, hormones that would usually challenge high school teachers come into play at EFPS. Most years this starts with the Grade 7's in the second half of the year, where many are 14 or 15 years old. However, because so many learners repeat Grade 6, this grade presented a real challenge in 2015. Learners were caught kissing in the afternoons when there is not enough supervision, and letters were sent home to parents. However, as mentioned before, sex is a very normal part of life for these children to the point where a Grade 6 girl got pregnant and left school.

### iv. Grade 1 Specific Challenges

Most children in this community do not attend Grade R, thus Grade 1 is their first exposure to formal schooling. Children may also not repeat Grade R (WCED, 2015). School gives children a routine and rules, often for the first time. This is met with quite a lot of resistance and means that discipline in the Grade 1 class is very challenging. One boy was not toilet trained when he started the year, and many still wet the bed at night.

The Education department has imposed a "90% rule" on Grade 1 learners, requiring that 90% of Grade 1 learners must progress to the next year. If a child has not attended or was only been progressed through Grade R they spend most of the Grade 1 year catching up. Learners with FAS particularly struggle in the first year of formal education as explained in Chapter 5. The majority of the grade does not meet the

requirements for promotion, but must be progressed because of this rule. EFPS's Grade 1 pass rate for 2014 was too low, resulting in the school being placed on a watch list.

One of the biggest challenges in Grade 1 is the difference in ability of the learners (see figure 4.2 for an example of two workbooks). There are three distinct groups of learners:

1. Those who attended Grade R and passed, or are repeating Grade 1, making them ready for Grade 1;
2. Those who attended Grade R but did not pass, so have been exposed to discipline and routine but are not able to do the work;
3. Those who have never attended formal schooling before.

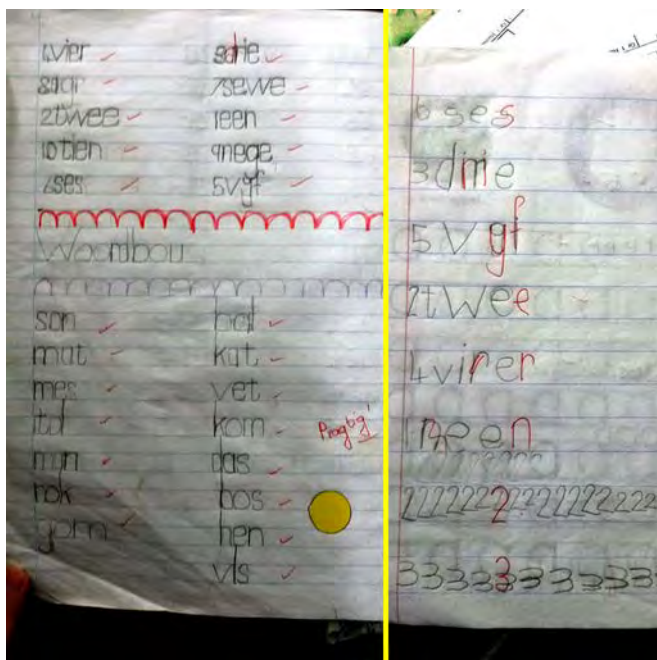


Figure 4.2: Learners Books – comparing a strong learner (left) with a weaker learner (right)

These three groups require vastly different teaching methods, thus the class is split. The official teacher resides over Group 1 (given books with thin lines) and Group 2 (given books with thick lines), requiring different levels of work and divided attention, leaving stronger learners bored. The teaching assistant teaches Group 3 in a Wendy house which is also used for storage. This smaller group allows for more individual attention, but this is not a well-equipped learning area. It is very tight, with no space to walk around desks, especially since most of the space is used for storage and clutter which is distracting for learners with FAS, therefore counterproductive. There is very little ventilation, and the structure is not well insulated against the harsh summers and winters. The teacher cannot stand upright,

as the ceiling is too low, and must write on a portable chalkboard that is so worn that chalk hardly shows.

Learners do not have the required stationery, especially in Grade 1. Any time instructions are given there is a chorus of “Teacher I need a pencil”. Teachers continually buy new pencils, sold a school for R2, but they seldom last more than a week. Borrowed pencils, colouring crayons and sharpeners are not returned and erasers are chewed as chewing gum.

Added to the challenges in Grade 1, the classroom was renovated in the middle of 2015. This meant that everything had to be removed and class had to take place in the school hall, with a Grade 4 class. This was disastrous since sound echoed around the hall resulting in neither class hearing their teacher. It was only a temporary arrangement, but the contractor only removed the tiled floor and never returned, apparently unable to complete the job for the tendered amount. After weeks of frustration the Grade 1 teacher returned to the classroom, which now only had loose concrete flooring covered in makeshift carpets. This was not ideal in the middle of a harsh winter. Teaching resumed and by the end of 2015 and no further progress was made on the renovations.

#### **ii. Grade 4 Specific Challenges**

Because of progression criteria many learners reach Grade 4 without the necessary skills. It is evident that some cannot read simple words, preventing them from following teacher instruction. It is also a bottleneck grade, necessitating a split in two. The lines of this split were changed three times in 2015. Originally those learners who were very far behind were placed in a special class taught by the teaching assistant. However, the rest of the grade was too large so the division was done more evenly with strong and weak learners in each class. One class was under guidance of the teaching assistant in the hall, whilst different teachers for each subject taught the other. In order to expose all learners to switching classrooms the classes were reversed and rearranged after the June holidays. These disruptions and uncertainty made continuity very challenging.

The WCED did not send enough textbooks and workbooks, posing particular problems when learners were required to do activities in workbooks. Pages were photocopied, but this disrupted almost every class and could not happen when the machine was out of order or there was no electricity (due to load shedding).

#### **iii. Discipline**

Most schools have some discipline challenges. However, the unique circumstances of EFPS exacerbate these for the school. Sadly, many children have grown up in households where communication took the form of abusive language, shouting and hitting. This means that soft communication is not appreciated or understood. A

Grade 1 girl related a message from her father that he will f\*ck a teacher up. This type of language is indicative of what most children know every day. Teachers who use the same harsh languages children have grown up knowing are often more successful in disciplining the class. Some children are too afraid to ask teachers' questions for clarification, therefore paging through textbooks aimlessly.

#### **iv. Mondays and Fridays**

Since two thirds of the learners are in the boarding house, weekly transport has a big impact on teaching time. Monday has historically been regarded as an unofficial weekly holiday in the rural Western Cape (Scully 1992, 62). Most children return to school on Sunday evenings, but over the weekend they have often been left unsupervised and without adequate food, which means that Mondays are required to reinstall discipline. Because of the lack of available transport, the busses have to leave as early as 11am on a Friday. The learners are excited to go home and are transported by region rather than grade, meaning that every class is interrupted.

#### **v. High Drop out Rate**

The Grade 7 class consists of 14 learners, 11 girls and 3 boys. Boys are less likely to carry on with school past the age of 15 (the legal school leaving age) because of the high opportunity cost. As physically strong and fit young men they believe they can earn a lot working on the farms. Even boys in younger grades spend holidays working on the farms and helping during peak season. Educational rewards are delayed, and the families are often in need of this added income. Girls are not as strong at that age, and parents often encourage them to continue their education until they become pregnant. When this Grade 7 cohort started in Grade 1 they were 36 learners, of whom 6 remained (the remainder joined the school later). 30 learners have therefore left the school (and perhaps the education system) during their junior school period since people do not generally move away from the community.

## Chapter 5: Challenges of Fetal Alcohol Syndrome

Fetal Alcohol Syndrome (FAS) results in considerable neurological and cognitive deficits (Howard & Beckwith, 1997, 396). Jones and Smith in the United States first identified it in 1973 when they noticed patterns of birth defects in children born to alcoholic mothers. Alcohol, as a known teratogen (causing developmental malfunctions) that impacts the Central Nervous System, leads to learning difficulties.

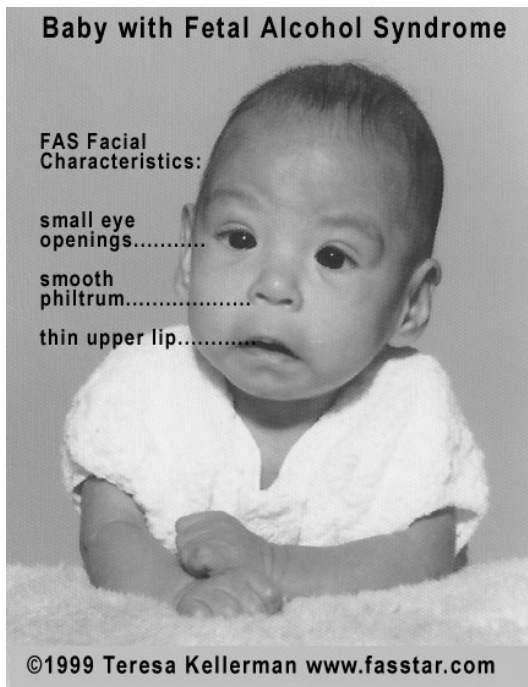
### a. FAS at Elizabethfontein Primary School

As Chapter 6 outlines, a local doctor screened learners from Grade 1 to Grade 4 at Elizabethfontein Primary School (EFPS) in order to diagnose those with FAS. Of the 170 learners, 21 (12.4%) presented enough evidence to be diagnosed with FAS. This is a much high number than identified in previous South African studies (see Chapter 1), where the highest rate found was 10%, in Aurora (Olivier et al., 2013, p.402).

Fetal Alcohol Spectrum Disorder (FASD) is a broader classification of the effects of alcohol exposure (Howard & Beckwith, 1997, p.399) and is more difficult to diagnose. The child functions within the normal range intellectually (around an IQ of 80, which is just above mental retardation levels), though the effects are evident in their behaviour (such as speech and language impediments, and shortened attention spans). FASD is estimated to be three times as prevalent as FAS (Howard & Beckwith, 1997, p.399). If an extrapolation is taken, as many as 63 of the 170 learners (37%) within this sample could present with FASD.

### b. How FAS influences the classroom

Every learner with FAS or FASD presents unique challenges within the classroom that have been examined by numerous studies. The medical diagnosis of FAS outlines three main spheres of influence (Howard & Beckwith, 1997, p.399). Firstly, it these manifest in growth retardation and microcephaly (small head and underdeveloped brain). Secondly, suffers show patterns of physical and facial abnormalities (see figure 5.1). Thirdly they may show central nervous system (CNS) abnormalities, which manifest in developmental delays, hyperactivity, low intelligence, reduced attention spans, and seizures. Heart and joint problems have also been reported.



*Figure 5.1: Facial Features of Baby with FAS [Source: Kellerman (1999) available online at [www.fasstar.com](http://www.fasstar.com)]*

As infants, FAS children cry often, and have difficulty sleeping and reaching normal developmental milestones (Howard & Beckwith, 1997, p.399). However the challenges of the syndrome, outlined below, are especially prominent within the classroom. The examples below are from my own observations at EFPS. All learners mentioned were later diagnosed with FAS.

#### **i. Mental Disabilities**

FAS is thought to be the biggest cause of mental retardation in the Western world (Abel & Sokol 1987). Mattson and Riley (1999, p.3) found that the average IQ of an individual with FAS is around 70, which is the borderline for classification as being disabled, meaning that many miss the cut off point for financial support by a small margin.

Howard and Beckwith (1997, p.399) report difficulties with speech and language for FAS children, as discussed in Chapter 8. Research focusing on adolescents and adults with FAS shows that learning plateaus, though the age at which this happens depends on the extent of damage sustained from prenatal alcohol exposure (Howard & Beckwith, 1997, p.400). The differences identified in this study are therefore likely to increase as learners' progress.

Chris\* in Grade 3 was able to sound out the letters of a word, but could not put them together to read the word. This use of phonics as a reading skill has been shown to be ineffective with FAS learners (Tanner-Halverson, 1999, p.86). He relied heavily on stronger learners in the class to read instructions for him and often act as scribes. It

also took Chris almost two hours to complete a list of numbers from 1 to 100 (his classmates finished in 15 minutes), during which time I worked with him intensely, and rewarded him with an Easter egg upon completion. He requires a designated helper constantly, often keeping other pupils from their work to assist him.

As concrete thinkers, children with FAS find abstractions difficult (Howard & Beckwith, 1997, p.399). Their inability to generalise from one situation to another causes considerable challenges when explaining concepts such as time, space, figurative language, and cause and effect. For example, Chris became very upset when I referred to his class as my “appelkoosies” (apricots, as a term of endearment) as he did not understand that he had not actually turned into a fruit.

EFPS emphasises the core values of love, respect, kindness and honesty, but those learners with FAS cannot understand how these should be applied in every situation, they require concrete examples and reinforcements (Tanner-Halverson, 1999, p.79). Good behaviour has to be formed through habits that are enforced by consistent consequences. Inability to understand time also means that learners cannot plan ahead and thus they rely heavily on routine.

FAS children experience memory difficulties, especially verbal, story, working, and visuospatial memory (Mattson & Riley, 1999, p.6). This manifests in an inability to follow instructions. For example, the Grade 2 class at EFPS were required to make a small recipe book and draw pictures for every step. Liz\* could not understand the concept of writing one instruction per page and drawing the picture next to it. She asked me for help on every line, and had to make the same corrections repeatedly. This task took her much longer than others to perform, and required constant attention, which is not always available.

Mark\* (Grade 4) did not hear when the teacher told them what page to work on because of other distractions in the classroom and hearing difficulties. He disrupted the class by constantly asking the teacher for clarification whilst she tried to complete the instructions. Providing visual instructions as well as verbal instructions can help learners with FAS understand the process, and encourages them to discover the process themselves instead of relying on the teacher.

Visuospatial memory difficulties mean that learners cannot focus on the details of something they are trying to copy, making copying from the board particularly challenging (Howard & Beckwith, 1997, p.399). Chris\* (Grade 3) lost his place every time he looked down at his book, which meant that he never finished writing down from the board. He required the work on the board work to be copied onto a piece of paper and placed next to him, from where he copied it into his book. He still required a ruler (to keep his place) and constant monitoring to ensure he did not skip lines. This type of individual attention is not always possible in large classes.

## ii. Hyperactive, Distractible and Inattentive

Mattson and Riley (1999, p.9) described the hyperactivity of learners with FAS as resembling those with Attention Deficit Hyperactivity Disorder (ADHD) for which it is often mistaken. Medications such as Ritalin have been prescribed to these learners, and have had some positive influence on their behaviour and concentration spans (Howard & Beckwith, 1997, p.399). Hyperactivity has a negative externality, as it influences the learning not only of the hyperactive individual, but also their classmates, who may be distracted by this behaviour and receive less teacher attention as the teacher's focus will be shifted to maintaining order.

Ben\* in Grade 4 was unable to sit still; he always tapped a beat on the desk or played with scissors. His frustrated, pent-up energy was somewhat released through his dancing, which he would sometimes practice in class without permission. Because of his small stature he would also crawl under desks to hide to get out of work, disturbing other learners in the class. I was often forced to stop while he was picked up off the floor or asked to stop tapping, as it was disruptive. Lessons that involved group work or class discussions were particularly challenging.

Janet\* in Grade 1 was unable to listen to the teacher's instruction when she was positioned facing the door as anyone walking past would distract her. She often announced new arrivals to the whole class, even if the teacher was in the middle of a sentence. This disrupted the lesson and caused the teacher great frustration. When the Grade 1 class was forced to move into the hall (see Chapter 4) the situation got worse as she was unable to disregard the Grade 4 class taking place simultaneously. She was later removed and placed in the Wendy house with a small group of classmates and the teaching assistant, which helped considerably.

Oversensitivity to touch and other stimulation (Howard and Beckwith, 1997, p.399) also necessitates the removal of FAS children from loud or crowded classrooms. Many learners with FAS would shut their eyes or block their ears when the stimulation became overwhelming. They often shut down, by engaging in a non-productive activity such as rolling a "paper cigarette" after a period of overstimulation.

Studies of infants with FAS note a "non-alert" state, where they are awake but do not seem to focus on anything (Mattson & Riley, 1999, p.9). Small children with FAS also show an inability to invest, organise and maintain attention. This is captured by one of the behavioural categories measured in classroom observations – *Off Task Passive* behaviour (Chapter 6), which describes those instances where a learner simply stares into space. Unlike *Off Task Verbal* and *Off Task Motor* behaviours, passive behaviour does not have a negative externality. The learner is not actively disrupting their classmates or demanding the teacher's attention. However, at the same time, they are not benefiting from the lesson.

Tasmin\* in Grade 4 is a very quiet and well-behaved girl from whom one would expect high marks. Teachers were disappointed, frustrated and confused by her inability to perform well in assessments and asked for her to be observed. She often spent extended periods of time staring into space and would therefore miss vital information. For example, the teacher told the class to turn to a specific page in their books and complete the exercise. Tasmin missed this instruction, and was pulled back to reality when the rest of the class started taking out their books and working. Too shy to ask the teacher to repeat the page number, she spent the rest of the lesson paging through her book, looking for the page.

### **iii. Social Difficulties**

Children with FAS often find it difficult to develop friendships and get taken advantage of (Howard & Beckwith, 1997, p.399). They find it difficult to understand social cues, act impulsively, have trouble with transitions and suffer from severe temper tantrums. The inability to get along with peers is mentioned as one of the most common learning problems contributing to disruptive school behaviour in a study of FAS learners by Streissguth, et al. (2004, p.233). For example, Ben found it difficult to get along with some of his classmates, especially since they teased him about being small. This resulted in him attempting to attack a boy with a pair of scissors. I was luckily able to catch him around the waist and pick him up before anyone was hurt. When taken outside to cool off he threatened to run away from school because the other learners tease him.

At the same time, children with FAS are very affectionate and interested in others (Howard & Beckwith, 1997, p.399). They want to be liked and want to make friends. Sarah\* (Grade 3) always offers to carry things for her teacher and go on errands. This means that she spends a lot of time outside the classroom, especially since she gets distracted. Older learners can take advantage of this kindness, and abuse this trait in FAS learners.

### **iv. Strategies for Intervention**

Methods of helping learners with FAS were explored by Tanner-Halverson (1999, p.78) in a four-year study conducted in Arizona. Their aim was to develop appropriate educational techniques and management for FAS learners, which would result in behavioural and academic improvements. The five main principles they based intervention on are: Structure; consistency; short lessons; variety; and repetition.

The removal of disruptive learners from the classroom until their behaviour improved proved beneficial to the rest of the class (Tanner-Halverson, 1999, p.78) and the attention span of those learners with FAS was increased. Reading ability of FAS learner was helped by using the vertical plane (holding the book upright)

instead of the horizontal plane (the book lying on the table), and using coloured dots to show what side to start and end a line (Tanner-Halverson, 1999, p.86).

Using designated areas and visual aids, showing the passage of time with pictures such as an hourglass, and depicting rules through activities such as role-play allows FAS learners to feel in control (Tanner-Halverson, 1999, p.79). Long activities, especially those requiring a process with a beginning, middle and end, are often hard to keep track of for a learner with FAS (Tanner-Halverson, 1999, p.80). The teacher should show the process with pictures and help the learner mark off when sections have been completed and model the thinking process out loud. Scheduling opportunities for the release of pent-up energy, such as walking around the playground or running errands, may help maintain order (Tanner-Halverson, 1999, p.85). Learners with FAS should be seated as close to the teacher as possible, especially since eye contact is vital for maintaining concentration.

Removal of visual displays in the classroom, especially when they are not used, ensuring that a learner's work area is clean and using uncluttered worksheets has also been found to help learners with FAS to stay focused (Tanner-Halverson, 1999, p.79). The use of a "privacy board", which is placed in such a way that learners can see classmates faces but not their desks, has helped reduce overstimulation (Tanner-Halverson, 1999, p.82), as did the use of earphones playing soft music. As children with FAS often struggle to follow verbal instructions, the teacher should write instructions and page numbers on the board as well. Assessments must also be aimed towards testing knowledge, not attention span.

Sadly, many of the strategies used would not be possible in the mainstream classroom as it would be too time consuming. There is no special school for FAS learners in this area, and the class designated to learners with special needs at EFPS was closed at the end of 2015 because of budget constraints. EFPS employs teaching assistants in most grades, who could assist with the individual attention required if trained properly. Other examples of specialised schools and how their strategies can be translated into a workable model for a mainstream school is vital for helping learners with FAS reach their potential.

### **c. The Future for an FAS Child**

An important consideration is what future awaits those children who have been diagnosed with FAS. In their research, Streissguth et al. (2004, p.230) studied Adverse Life Outcomes and how these are influenced by Risk factors. The Adverse Life Outcomes identified were: Inappropriate sexual behaviour; disrupted school experience; trouble with the law; confinement (arrest or admission to a psychiatric facility); and alcohol or drug problems. Of some concern is the fact that some children within this study already display early signs of such Adverse Life Outcomes. Young learners already display knowledge of sex inappropriate to their age and some

learners have already engaged in inappropriate sexual behaviour, which includes promiscuity and inappropriate sexual advances, which could lead to unplanned pregnancies. Some learners have also broken the law, for example stealing and engaged in drug or alcohol abuse, such as sniffing petrol. Combined with the increased risk of alcohol and drug abuse, this could result in another generation of children with FAS.

In order to reduce the later impacts of such behaviour one must examine how the risk factors are dealt with in this community. Diagnosis of FAS after the age of 12 results in the odds of all 5 Adverse Life Outcomes increasing 2 to 4 fold (Streissguth et al., 2004, p.230). Since an FAS diagnosis of children must be kept confidential according to the Ethical Clearance, and the Department of Education discourages such official diagnoses to prevent learners being stigmatised, the supportive role of carers is diminished. Special classes and learning outcomes can be designed for these children, but are limited by resource constraints and cannot be implemented until the child is diagnosed. Since their IQ is often at the borderline for mental disability, individuals with FAS often do not qualify for disability grants.

A stable and nurturing household, free of abuse of alcohol and sexual abuse (very different from household into which these children are often born) could be beneficial to children with FAS. The Clanwilliam community is riddled with alcohol and substance abuse (Chapter 3) and yet has no children's home to provide safe refuge. The school boarding house is therefore often used as a safe house for these children. But they are forced to return home over weekends.

Michaela noted that attending the high school in town, which allowed longer term boarding, provided her with an escape from her household circumstances, thus contributing to her long-term success. Since many children in this community are not given such an opportunity, and most leave school before completion there is a need for such a safe haven outside of school. The vulnerable time for such children extends to the transition between childhood, adolescence and adulthood, when the school support system is not necessarily present. There is an urgent need to keep adolescents in school, but this often proves problematic in rural environments.

## Chapter 6: Methodology

This chapter outlines the methodology used in data collection and diagnosis of children with FAS. It describes: the process used throughout the year; ethical clearance attained; why this school was selected; measurement and quantification of educational outcomes; the diagnosis process; and the reason for inclusion and measurement of other variables.

### a. Description of process

The study commenced in January 2015 at the start of the school academic year. Upon arrival at the school the Grade 3 class was identified as the best setting to understand the running and operations of the school as the class teacher is also the deputy headmistress and could thus provide meaningful interpretation and input. From the start the learners identified me as a teacher to ensure no observation bias. The Grade 3 teacher asked me to conduct reading assessments of all the learners to ascertain which learners were strong and who required extra intervention. It was therefore decided to test the reading ability of all learners in Grades 1 to 3 (see section d.ii of this chapter).

Most of the first school term (21 January to 1 April) was spent completing the reading scores of all 166 learners and observing the general running of the school and gaining the trust of teachers and learners. Language was also a challenge, as all interactions took place in Afrikaans. Although I am fluent in Afrikaans, specific vocabulary and accents took time to understand. Staff and learners were very helpful throughout this process.

*Table 6.1: Composition of the Sample Grades*

	Boys	Girls	Number of Learners
Grade 1	27	23	42
Grade 2	20	17	37
Grade 3	14	19	33
Grade 4	33	21	54
Total	94	72	166

After the Easter school holidays the second term (13 April to 26 June) was spent concentrating on classroom behaviour of the children (see section d.iii of this chapter). This required a considerable amount of time with each class and allowed insight into general trends and marked differences in teaching strategies. It also allowed in-depth interaction with all the learners in the sample group. As discussed later in this chapter, circumstances interrupting classroom attendance necessitated a return in the third term (20 July to 2 October) to complete the observations. During the return visit there was not sufficient time to observe each child individually, as done before, therefore groups of children were video recorded for the allocated

amount of time and observations were completed outside the classroom. Through this process all learners were observed twice under instruction of different teachers.

The learners' class marks for Mathematics and Afrikaans Home Language were obtained at the end of the second term, which reflect their half-year marks (see section d.i of this chapter). During this time a local doctor also examined the children in order to diagnose those with FAS (see section e of this chapter). The final results were only disclosed to me in the fourth term (12 October to 9 December), thereby eliminating researcher bias.

During research at the school many other factors that could have an effect on educational outcomes were identified and highlighted by the teachers (see section f of this chapter). These were also recorded and included in the analysis.

At the end of the academic year I returned to the school as part of outreach by an affluent Cape Town school. During this visit feedback was given to the teachers about the results of the research. There were requests from teachers for a further follow up visit in the following school year for interaction with parents. This would be to inform them of the results and future strategies to reduce the number of FAS cases and help those children who already present with FAS. This will take place in 2016, which EFPS has designated as "*The Year of Alcohol Awareness*" in response to this study.

#### **b. Ethical Clearance**

Ethical clearance was obtained from the University of Cape Town (UCT) Commerce Ethical Clearance Committee. In accordance with the requirements of this clearance, the names of individual children within the study may not be disclosed. Permission for conducting this study was also attained from the school and from the parents of the participating learners. This permission process was lengthy as forms could only be sent home over weekends because learners were weekly boarders. Since the learners are also very young they had a tendency to forget about the forms. Therefore an incentive scheme was introduced in which a learner was entered into a lucky draw for a chocolate when they returned their form, which stretched over 5 weeks. Once a learner had returned their form they were included in the draw for all subsequent weeks. All forms were returned, with only one parent refusing their child's participation in the study. The child was removed from all research analysis or findings, but was not excluded from any classroom participation to ensure they were not singled out.

#### **c. Why this school?**

Elizabethfontein Primary School (EFPS) has strong ties to many supportive schools, including Diocesan College (Bishops) in Cape Town. Every year Grade 10 learners from Bishops do an outreach to EFPS for the last two weeks of the academic year as

part of an exploration of the Cederburg region. The boys engage in activities such as interacting with the learners, painting the school buildings and donating bedding and mattresses. Learners from EFPS also visit Cape Town arranged by Bishops during a leadership camp in an attempt to widen their horizons. This is a very strong partnership and Bishops donates a large amount of money to EFPS and Bishop's Grade 10's gain a new understanding of life in a farm school. The Mark Hanley fund, administered by Bishops, also offers bursaries to promising Grade 7 learners from EFPS to attend a good high school in Clanwilliam.

From the first interaction, the Headmistress of EFPS was enthusiastic about this study being done at the school, hoping it would benefit the community.

Bishops was also very interested in the findings and I returned to EFPS with the Bishops Grade 10 learners to provide them with insight into the deep rooted problems faced by this community. There is sustained interest from both sides to make a difference in this regard.

#### **d. Considerations for Educational Outcomes**

Measurement of educational outcomes for primary school learners requires sensitive consideration. According to Spaul (2011, p.14) special attention must be given to the language in which tests are conducted. Tests learners write should be conducted in their home language. If the children are predominantly Afrikaans speaking, measurement of their level of education must be done in Afrikaans.

This study is, however, was not only concerned with a child's marks, but also with their behaviour in class. According to Streissguth et al. (2004, p.228) children with FAS display difficulties mastering intellectual, academic, and adaptive living skills. Quantification of the manifestation of these difficulties within the classroom is problematic.

Three educational outcomes were considered in this study: Reading score; classroom behaviour; and class marks (Afrikaans Home Language marks and Mathematics marks). Data on these educational outcomes was obtained through collection of existing data (Home Language Mark and Mathematics Mark), collection of new data (Reading Score) and participant observation (Classroom Behaviour).

#### **i. Class Marks**

Traditionally, educational outcomes consider mainly class marks. It is therefore imperative to include this measure in the study. However, researchers and teachers must consider that good marks should not be the only aim of education, although they are the most easily measured outcome. Other educational outcomes at EFPS relate to the value system they strive to instil on the learners (see Chapter 4).

Nonetheless, the mid-year marks for all learners, as these appeared on their school report, were obtained. Most grades included marks for Home Language (Afrikaans), Mathematics, First Additional Language (English) and Life Orientation. Grade 4's marks also include specific subjects such as Natural Sciences and Arts and Culture. However, Grade 1's marks were limited, only comprising Home Language (Afrikaans) and Mathematics. For comparative purposes only these two subjects were considered for all learners in the sample.

## ii. Reading Score

The assessment of the reading scores of the children was requested by the Grade 3 teacher, as she wanted to ascertain the ability of the learners upon first entering her class. Reading is one of the first skills a child learns upon entering school. If it is not mastered their academic development will suffer (Ersterhuyse et al., 2002, p.144). The Grade 3 teacher provided a list of sight words, and I assessed learners individually. The score reflects the percentage of words they did not require assistance with. For example, if a child struggled with 20 words out of 120 they attained a mark of 100/120, which is 83.33%. Unlike most tests peers could not assist. The normal practice is to have the whole class read at once, where stronger readers speak loudly and weaker readers simply follow. It also provided an opportunity to interact with each learner and establish my identity as a teacher. To reduce preconceptions, no information about the strength of the pupils was obtained before testing commenced. I conducted all assessments to ensure consistency across all learners, classes and grades.

The Grade 3's reading was tested first. The teacher provided 120 words, which they were asked to read. It soon became evident, however, that some learners found this an easy task others were not able to perform. Those who struggled got very despondent, and their testing was therefore broken into different sessions but took place in the same time period. To give each learner a sense of accomplishment reading either took place all at once, in groups of 30 words or in groups of 10 words. Some learners also required the words to be written bigger, and different versions or fonts of letters such as "a" proved to be stumbling blocks. The use of different colours for different letters or sounds helped. I determined which learners required this special attention rather than the teacher.

Grade 2 learners were tested next. This process went faster as the teacher allowed the learners to be tested continuously and only 100 words (provided by the teacher) were read. Once again those learners who found the process more difficult were allowed to complete it in different sessions, especially since such extended periods of intense concentration are difficult for 9 year olds. Each learner assessment could therefore take up to 15 minutes. Many learners needed colours and kinetic recognition strategies, for example tapping themselves on the head when they saw a letter "t" to reduce confusion with the letter "f". All learners were tested in the same

time frame, but one learner left the school before their measurement could be completed. This reading mark is therefore omitted. Some learners were shy about their inability to read, hiding it from the teacher and peers. These learners were tested after school. However, as the teacher cannot provide specialised intervention if she does not know about the problem she was provided with the learner assessments. If the learner struggled to read a word I would use it in a sentence, which was often echoed immediately as would happen if they were reading aloud as a class.

When Grade 4 reading was tested learners were removed from class individually as classes are very full because of the size of the Grade 4 group and learners move between classes in different periods. During the first term, when their reading was tested, the Grade 4 learners were split into two classes, according to ability. The Afrikaans Home Language teacher provided a list of 150 words. It was evident that the learners in the “stronger” class had no trouble with these words, attaining very high scores. However, the “weaker” class presented very different results, with one learner only able to read 4 words of the 150 (see Chapter 6). This means that there are some learners who have been left behind by the system who many never catch up. The same strategies used with learners in the lower grades were adopted for Grade 4 learners. Specific, specialised intervention with an experienced teacher is required to remedy this, as an inability to read will have an impact on all other subjects, even Mathematics in the form of “story sums”.

The Grade 1 teacher did not feel they had learnt enough in the first term to read full words. Grade 1 reading was therefore first tested at the end of the second term. However, it was evident even then that they were still unable to read enough to be tested. Their measurement was therefore done in the third term. Unlike the other grades, the teacher provided sentences (consisting of 50 words) taken from a book “Boet en Saartjie” instead of just words. It was evident that many of the learners had learnt the sentences off by heart, and were reciting rather than reading, resulting in very high scores that do not necessarily reflect ability. There were also 4 learners who officially passed Grade 1 because of the 80% rule (discussed in Chapter 4) but their academic ability did not enable them to proceed to Grade 2, although their class marks were at a Grade 2 level. Their reading marks, tested at a Grade 1 level, were far above what their ability would have been on a Grade 2 level, necessitating their omission from the data.

In retrospect, the level of reading across the grades is not comparable, though within the grade it may give some insight. However, running regressions within a specific grade would reduce the sample size to the point where useful information may no longer be attained. Standardised reading tests such as the ESSI reading and spelling test in Afrikaans would have allowed meaningful comparisons across grades, but can only be administered and interpreted by a registered psychologist or support teacher

(Esterhuyse et al 2002, 148). Still, the testing of learners individually allowed me to be identified as a teacher, thus reducing observation bias.

### iii. Classroom Behaviour

The link between FAS and classroom behaviour has been alluded to in the literature (Howard & Beckwith, 1997, p.399), but never specifically examined within the South African context. Encompassed in the diagnosis of FAS are criteria for Central Nervous System (CNS) manifestations, but the translation of these into classroom behaviour is not quantified. Quantification of this relationship would assist in the development of strategies to help the learners.

Educational theory has developed numerous coding schemes for direct observation of learners' classroom behaviour (Volpe et al., 2005, p.454), Each coding scheme has been developed with a specific focus and objectives. The most useful and appropriate observational code is the Behavioural Observation of Students in School (BOSS) outlined in Table 6.2. This code was selected because of it is sensitive to the behaviours often displayed in foundation phase classrooms and offers a sensitive measure to detect subtle differences in behaviour. The time period of observation is also only 15 minutes, which in this study allowed two observations per learner over the six-month period.

BOSS measures the level of on- and off-task behaviour to determine learners' academic behaviour in the classroom (Shapiro, 2004, p.55). The behavioural categories, which describe what a learner is occupied with during the time of observation, include: Active engagement time; passive engagement time; off-task motor; off-task verbal; off-task passive; and teacher direct instruction. It can measure subtle differences since this code is sensitive to attention deficits, which is one of the symptoms of FAS. The recommended use is for classroom comparison between learners although it is sensitive to manipulation by the observer. All learners in the class (i.e. not only those diagnosed with FAS, especially since the specific diagnosis was unknown at observation) were observed, to control for differences in discipline resulting from teacher input and other influences. The learners were observed twice, with different teachers present, to reduce measurement error.

The Boss Code can be outlined as follows:

*Table 6.2: BOSS Code Outline*

*[Source: Adapted from Volpe and DiPerna (2005 p.457)]*

<b>Behavioural Observation of Students in School (BOSS)</b>	
Behavioural Categories	<ol style="list-style-type: none"> <li>1. Active engagement time</li> <li>2. Passive engagement time</li> <li>3. Off-task motor</li> <li>4. Off-task verbal</li> <li>5. Off-task passive</li> <li>6. Teacher direct instruction</li> </ol>
Strengths	<ul style="list-style-type: none"> <li>• Measures aspects of Attention Deficit Hyperactivity Disorder (ADHD) as well</li> <li>• Specific assessment of active student engagement</li> <li>• Sensitive measure</li> </ul>
Limitations	<ul style="list-style-type: none"> <li>• Sensitive to researcher manipulation</li> <li>• Recommended use of classroom comparison children</li> </ul>
Recommended Use	<ul style="list-style-type: none"> <li>• Describing classroom behaviour of children</li> <li>• May be useful in assessment of externalising behaviour</li> </ul>

In order to quantify the effects of FAS, the counterfactual must also be considered. A perfect counterfactual would involve measuring the behaviour of a learner with FAS and comparing it to the behaviour of the same learner without FAS. This is not possible, thus comparisons are made via regression analysis that controls for other influencing factors (such as sex). The code was applied to every learner within the classroom, and converted to a quantitative measure. The BOSS measurement code has been adapted to a behavioural form for use in the classroom, which is depicted in Figure 6.1 below.

Learner Name:		Learner Grade:	
Reading Score:		Behaviour Score:	
<p>Behaviour Score: Behavioural Observation of Students in School (BOSS)          Period: 15 Minutes          Segment: 10 Seconds</p>			
<b><u>Behaviour</u></b>	<b><u>Weight</u></b>	<b><u>Frequency</u></b>	<b><u>Score</u></b>
Active Engagement Time	$\frac{5}{5}$		
Passive Engagement Time	$\frac{4}{5}$		
Off-task Motor	$\frac{1}{5}$		
Off-task Verbal	$\frac{1}{5}$		
Off-task Passive	$\frac{2}{5}$		
Teacher Direct Instruction	$\frac{3}{5}$		
Total			
<p>Average Score <math>\left(\frac{\text{Total Score}}{\text{Total Frequency}}\right)</math> :</p> <p>Behavioural Percentage <math>\left(\frac{\text{Average Score}}{5}\right) * 100</math> :</p>			

Figure 6.1: Behavioural Score Form

Every learner in the sample was observed for two 15-minute periods. Their of behaviour was classified into one of the six categories listed above. Each category was awarded a score out of 5 with 5 being most desirable. Active Engagement, which showed that the learner was engaging with the work either through writing or engaging with the teacher is most desirable, and was therefore awarded 5/5. Passive Engagement, which included passively listening to the teacher or awaiting further instructions, was awarded 4/5. Off-task Motor involved the child walking around or

clapping on the desk. Off-task verbal involved the child speaking or making other noises. Both these behaviours have the negative externality of bothering other learners in the class and adding to the general disruptive nature of the class, they were therefore awarded 1/5. Off-task passive was displayed when a learner was not engaging with work but involved non-disruptive behaviour, such as staring into space. It was therefore awarded 2/5. Teacher Direct Instruction involved a teacher spending individual time with a learner, clarifying work or helping them, as well as situations where learners were sent on errands. This is considered neutral behaviour, and was awarded 3/5.

The observation involved recording their behaviour for every 10-second segment. For example, if a learner was actively working or engaging with the teacher for 7 seconds, but passively looking at their work for 3 seconds, their behaviour was recorded as active engagement for that segment. The frequency of each behavioural segment was recorded in the frequency column. For example, if a learner spoke for 5 segments of the 15 minutes they would receive a 5 in the frequency. The total number of segments was calculated by totalling the frequencies and usually came out to 90 (i.e. 6 ten second segments per minute, multiplied by 15 minutes), though there was some deviation because of time required to record behaviour. The frequency of the segments was then multiplied by the weighting of that behaviour, for example speaking for 5 segments would be weighted by a value of 1/5, giving a score of 5. Actively engaging for 5 segments would be weighted as 5/5 giving a score of 25. The total score was then recorded as the sum of all the scores. This total score was divided by the total frequency to give the learner an average behavioural score out of 5, which was converted to a behavioural percentage.

Comprehensive descriptions and novel insights were provided through the use of this system. However, it is a very lengthy and time-consuming process that must be conducted by a single researcher to reduce observational and measurement error. The researcher must also be blind to the diagnosis status of the learners. The results generated from this process make it worth the effort (see Chapter 8), but the scope for a larger sample size may be limited.

This method of quantifying classroom behaviour was very useful and insightful. However, recording all the data was challenging. It was a very intensive process, requiring a high degree of uninterrupted concentration, not always possible in a primary school classroom. I was seen as a teacher, which meant that, although learners did not behave as they would if a stranger was present, they would continually ask me work related questions. Further disruption took place when teachers left the classroom, often for extended periods of time. This resulted in observation having to be halted while I took over the teaching role in the classroom. There were also numerous disruptions to class time, such as visitors to the school

and extracurricular activities, which meant that learners were not in the class to be observed.

The need to complete two observations per learner was seen as critical to remove timing bias. Different teachers were in charge of each class, therefore the repeat observation controls for the teacher effect. This resulted in the extension of the research into the third term, in which time constraints necessitated video recording groups of learners and assessing their behaviour from these recordings. This could be done without interruption, which proved useful and could be used in observing a larger sample size. However, the use of numerous observers should be cautioned against to ensure comparability of results. It is important to note that all observations were completed before the disclosure to me of which learners were diagnosed as living with FAS.

#### **e. Diagnostic Procedure**

The diagnosis of Fetal Alcohol Syndrome is based on 3: Typical facial features; evidence of abnormal cerebral (brain) development; and a history of alcohol use by the mother while pregnant. This system is easy to apply to young infants, but after 6 years of age it becomes increasingly difficult for a variety of reasons: Mothers forget their alcohol use during pregnancy or deny it when asked directly; the small stature noted at birth becomes less obvious as children begin to grow; and compounding medical factors are noted for the observable characteristics of the child. Abnormal Cerebral development is difficult to ascertain, and mental processes cannot be used in the study, as this will affect the ultimate conclusion. Thus only Microcephaly (small head) was used as an indicator in diagnosis of this developmental abnormality.

The diagnoses of the presence of FAS for each learner was conducted independently by a qualified medical doctor who resides in the district and is involved in the local hospital, clinic and examination of disability grants. The doctor screened all learners in Grades 1 to 4 (170 learners) on the same day. An anonymous number was assigned to learners to be used during the diagnosis period to protect their identity. The initial screening process involved basic anthropometry (i.e. weight, height and head circumference). Any child falling below two standard deviations of the normal value for their age on 1 January (as shown on Table 6.3: Initial Screening Table below) was included in the following round, constituting of 52 learners.

Table 6.3: Initial Screening Measurements [Source: Adapted from WHO (2015)]

Age	Head Circumference (cm)		Weight (kg)		Height (cm)	
	Male	Female	Male	Female	Male	Female
6	49	48	16,2	15,7	105,3	104,9
7	49	49	18	17,4	111	111
8	49,5	49	19,7	19,2	116,6	116,4
9	50	49	21,7	21,1	121,5	121
10	50	49	23,7	23,5	125,8	125
11	50	50	26,1	26,2	129,8	129,6
12	50,5	50	28,8	29,3	134,6	136,2
13	51	51	32,2	32,7	140,5	143,2

The examination round, conducted during a repeat visit by the doctor, involved repeated anthropometric measurements, examination for typical facial characteristics and examination for systemic manifestations of fetal alcohol exposure. Figure 6.2 below shows the FAS Assessment Form used by the doctor in this round, identifying 31 learners.

**FAS Assessment Form**

Candidate Number:  
DOB (Age in months):

Maternal EtOH use	Sure	Unknown	None
Anthropometry			
Birth:	HC	L	Wt
Current:	HC	L	Wt
Facial Features			
Short palpebral fissure	Thin upper lip	Smooth Philtrum	Epicanthal folds
Flat mid-face	Micrognathia	Flat nasal bridge	Short upturned nose
Systemic Manifestations			
Cardiac Exam:			
Skeletal Exam:			
Renal Exam/History:			
Ocular Exam:			
Auditory Exam:			
Neurological exam:			
Other:			

Diagnosis:

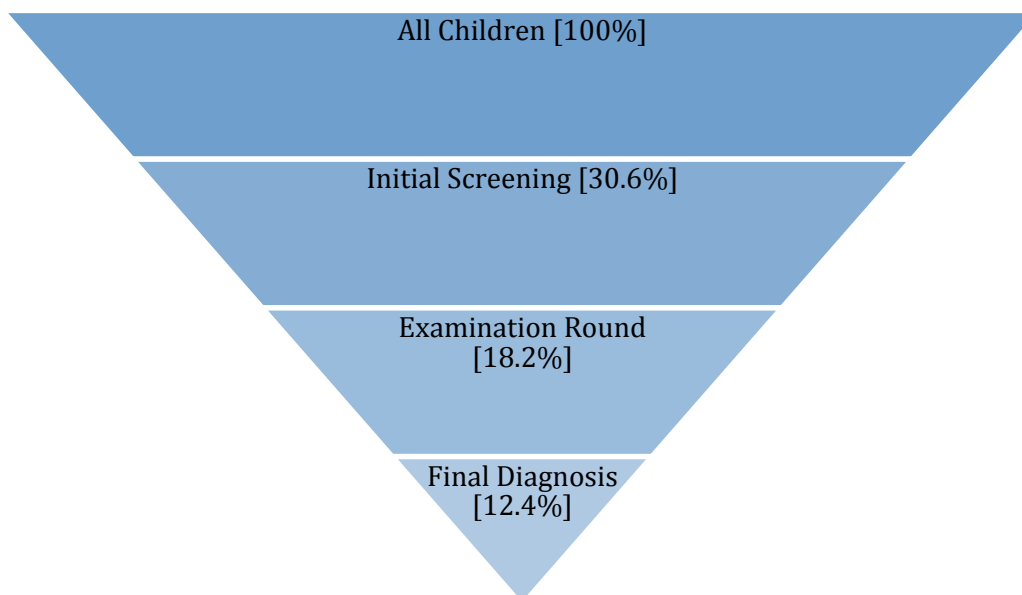
Figure 6.2: FAS Assessment Form [Source: Adapted from The Canadian Child and Adolescent Psychiatry Review (2003)]

The final phase was a review of maternity, clinic and hospital notes (to which the doctor was granted access) on the mother and child, leading to a final diagnosis of 21 children. Definitive conformation of maternal drinking could not be ascertained. All data was recorded on the FAS Assessment Form, specifically developed based on the literature and diagnosis requirements (Figure 6.2 above) to aid in review and final diagnosis. Misplacement of learner files by substitute teachers made finding required information challenging.

As Table 6.4 and Figure 6.3 show, the original sample consisted of 170 learners: 47 in Grade 1; 34 in Grade 2; 33 in Grade 3; and 56 in Grade 4. The Initial screening phase for the presence of FAS decreased the percentage of learners from 100% to 30.59% comprising 52 learners. The examination round reduced the percentage of learners diagnosed with possible FAS to 18.24%, comprising 31 learners, 12,35%, 21 learners, were finally diagnosed with FAS.

*Table 6.4: Number of Children Passing Through the Diagnosis Process*

	Grade 1	Grade 2	Grade 3	Grade 4	Total	Percentage
Full Sample	47	34	33	56	170	100
Initial Screening	17	12	10	13	52	30.6
Examination Round	13	7	6	5	31	18.2
Final Diagnosis	7	6	3	5	21	12.4
Percentage Diagnosis	14.9	17.7	9.1	8.9	12.4	



*Figure 6.3: Percentage of Children Pass-through the Diagnosis Process*

The original sample consisted of 170 learners, 12,35% of which were finally diagnosed by the doctor as learners with FAS. This is a very high percentage, since the highest percentage of FAS occurrence found in previous studies in South Africa was 10% (Olivier et al., 2013 p.402). Grade 2 had the highest percentage of FAS

learners at 17,7%, followed by Grade 1 at 14,9%, Grade 3 at 9,1%, and finally Grade 4 at 8,9%. This may be due to the fact that learners leave school at an early age if they are struggling, resulting in a high dropout rate of learners with FAS. It may also be the result of the requirement that learners may only fail once in a phase and the 80% rule (see Chapter 4).

Difficulties faced in the diagnosis process included: Poor attendance of learners, especially on assessment days, resulting in one learner being excluded due to lack of information (though it is unlikely that they had FAS); many of the hospital folders and information at the hospital have been lost due to changes in filing systems, including numbering and storage of the folders (in these cases the diagnosis was made on the current clinical examination). Complicated cases were also a burden, for example a learner was excluded despite possibly having FAS because birth abnormalities, prematurity, bacterial blood stream infection when new-born, and meningitis made the case too complicated for direct correlation to be drawn between cognitive impairment and FAS.

#### **f. Other Variables**

Staff and pupils identified other contributing factors influencing learner's educational outcomes. All these variables were controlled for to test the teacher's hypothesis that they are to blame for poor performance. These included: grade; number of days absent; living on a farm; boarding; having Afrikaans as home language; number of years too old for the grade; and sex. Data was collected on these variables and included in the regression.

##### **i. Grade**

As learners progress through school they are expected to increase their ability and mature. Grade 1 learners are therefore expected to receive the lowest behavioural scores. This was verified as all grades behaved statistically significantly better than Grade 1 learners (at a 1% level of significance). Grade 3 learners were found to be the best behaved (achieving between 11.5 and 15.9 percentage points more than Grade 1s), followed by Grade 2 learners (between 8.6 and 10.6 percentage points more than Grade 1s) and then Grade 4 learners (between 5.9 and 10 percentage points more). This suggests that increased maturity does not automatically translate to better behaviour.

The difficulty of reading words tested, home language and mathematics assessments, however, increase by grade. As a result, differences in achievements in these categories point towards the ability of learners to keep up with increased difficulty (See Chapter 8 for detailed regressions). Grade was not found to have a statistically significant impact on home language marks, showing that the increased difficulty of assignments was in line with increased ability. Conversely, grade always had a statistically significant influence on mathematics marks, with average mark

decreasing with an increase in grade. This shows that mathematics ability does not keep up with increased difficulty of work. Reading marks of Grade 2 learners were not statistically significantly different from that of Grade 1 learners, showing that reading ability of Grade 2 learners is not more than that of Grade 1 learners. Grade 3 and 4 reading marks are drastically and significantly more than that of Grade 1 learners, but this may be largely due to the difference in measurement method.

The influence of Grade may also be a factor of the influence of the specific teacher. Classroom observations were done under two different teachers in most cases, but the general influence of a specific teacher can only be removed by increasing the sample to include various classes with different teachers per grade, which was not possible at EFPS.

#### **ii. Days Absent**

EFPS offers weekly boarding for many learners, which has the unintended consequence that learners who are sick on a Sunday or Monday when they should come to school, possibly for legitimate reasons, are absent for the entire school week. Such high absenteeism results in learners missing significant portions of work and not having an adequate educational foundation. Being absent could also be linked to the health of the learner. Access to healthcare is limited and time consuming, learners in the boarding house have to be taken to town to the hospital or clinic, where waiting times are often very long. The result is that if a child is sick he or she could miss a significant portion of school activities. Regressions (chapter 8) did not show absenteeism to have a statistically significant impact, possibly due to a small number of strong learners being absent for extended periods of time.

#### **iii. Farm**

The catchment of the school is extensive (see Chapter 4) with many learners from the surrounding farming areas attending EFPS. A significant number of children attending EFPS live in the town of Clanwilliam, although there are closer schools. The parents of the town's children may prefer to send their children to EFPS feeling that it provides a better education than the town's schools, as well as providing exposure to dancing and other extracurricular activities. A "town" parent who makes a concerted effort to ensure their child goes to a better school is also more likely to give the child more guidance at home and take an active interest in their child's education. Whilst farm parents may be equally diligent they do not have the option of sending their children elsewhere. Therefore 'farm' may be a proxy for the amount of choice available to the parent. Living on a farm also offers less exposure to different life outcomes as opposed to becoming a farm labourer (see Machala's story in Chapter 3). There is also a library and other resources in town that farm children may not always have access to. The exception is learners living on Bushmans Kloof, where workers children have more resources (see Chapter 2) This could account for

farm not being found to have a statistically significant influence in the regression analysis (chapter 8).

#### **iv. Boarding**

As indicated in Chapter 4, two thirds of learners at EFPS live in the boarding house. The school requires most learners from Grade 5 to board, in an effort to protect them from harmful influences at home. This requirement is not placed on those learners in this study as they are in lower grades. Children who do not have daily transport are required to board from as early as Grade R. At the same time, the school makes a concerted effort to determine which learners face difficulties at home, such as neglect or abuse, and requires them to board, turning the boarding house into a safe haven. The measured effect of boarding is therefore a proxy for the effect of growing up under these tough domestic circumstances. Those learners who live at home may receive more individual attention from parents whereas the boarding mistresses are stretched, but the boarding house offers a fixed structure, routine, security and food.

By definition, a child with FAS or FAE has a biological mother who abused alcohol. Streissguth et al. (2004) find that the more time spent in a stable, nurturing home, the less likely a child with FAS is to display adverse life outcomes. Given the security provided in the boarding house, spending time in this environment may therefore help these children. Regression analysis (chapter 8) finds that the most significant influence of boarding is on mathematics mark (boarders score on average between 4.2 and 7.4 percentage points lower than non-boarders), which is likely due to the domestic situation they were removed from. Given this, the fact that behaviour of boarders was not significantly different from non-boarders shows the stabilising impact of this safe haven.

In order to ascertain whether the boarding house is helpful in this regard one would have to test how a child performs when in the boarding house compared to how they perform under difficult domestic circumstances whilst living at home. This would be very difficult as they can only live in one place at a time, and it would be unethical to purposefully leave a child in a potentially dangerous situation.

#### **v. Afrikaans Home Language**

The medium of instruction at EFPS is Afrikaans even though some learners speak other languages at home, such as isiXhosa or isiSotho. Spaul (2011 p.14) highlights the importance of testing a child in their home language. The influence of not having Afrikaans as mother tongue is expected to be negative, even though there are limited cases. Most second language learners live on Bushmanskloof where their parents are employed, and the positive influence of living on this lodge (outlined in Chapter 2) may compensate for these language challenges, which may explain why the influence of Afrikaans as home language was not found to be statistically significant (chapter 8).

#### vi. Years too Old

As explained in Chapter 4, the majority of learners are not the correct age for the grade. It is therefore of interest to see whether repeating a grade or being kept back at any stage increases learner's performance. This variable was calculated as the difference between the age they should have been at the beginning of that grade and their biological age. Being too old can be attributed to having repeated a grade (having failed) or starting school too late. The latter could result from: Not having adequate resources to allow for school attendance; lack of parental commitment to education; or lack of permanent residence (seasonal labour). Regression analysis (chapter 8) find that home language marks decrease on average by 2.5 to 6 percentage points for every year a learner is too old (at a 5% level of significance) and does not have a statistically significant influence on other educational outcomes. This questions the ability of a repeated year to help a learner catch up.

#### vii. Sex

Traditionally men have been regarded as more intelligent, though this is not supported by the literature. When intelligence tests have been designed to minimise differences in ability by sex, boys and girls perform largely the same (Woolfolk, 2010, p.120). However, boys receive more varied scores and are diagnosed with learning disabilities more often. Girls perform better when verbal ability is tested, and boys perform better on visuospatial tests (Halpern et al 2007, 40). In this study home language and mathematics marks were considered (Chapter 8). Since home language measures verbal ability it is unsurprising that girls received on average between 2 and 9 percentage points more for this subject (at a 10% level of significance when other factors are controlled for). Conversely, when other factors are controlled for, boys receive on average 4 to 4.7 percentage points more for mathematics (at a 10% level of significance). Boys were found to have significantly worse classroom behaviour (up to 6,3 percentage points at a 1% level of significance) than girls. The fact that sons of alcoholic fathers perform worse in school (Howard & Beckwith 1997, 398) may contribute to this.

## Chapter 7: Statistical Analysis

This chapter describes the econometric analysis of data collected during the research at Elizabethfontein Primary School (EFPS). The first section describes each variable and their interactions, followed by a description of the econometric analysis. Next the full regressions as well as interactions between grade and Fetal Alcohol Syndrome (FAS) are discussed.

This section describes the variables used in the regressions discussed in the next section. First the educational outputs (home language mark, mathematics mark, reading score and classroom behaviour) are described, followed by other explanatory variables.

### a. Home Language

The Home Language measure consists of the percentage score a learner attained for Afrikaans on their mid-year report. Every teacher determines this mark according to the curriculum. There are 166 observations with a mean of 51.17 and a standard deviation of 16.45. The lowest mark recorded is 14 and the highest is 90. This distribution is near normal with an adjusted Chi Squared of 3.01 ( $p=0.2217$ ).

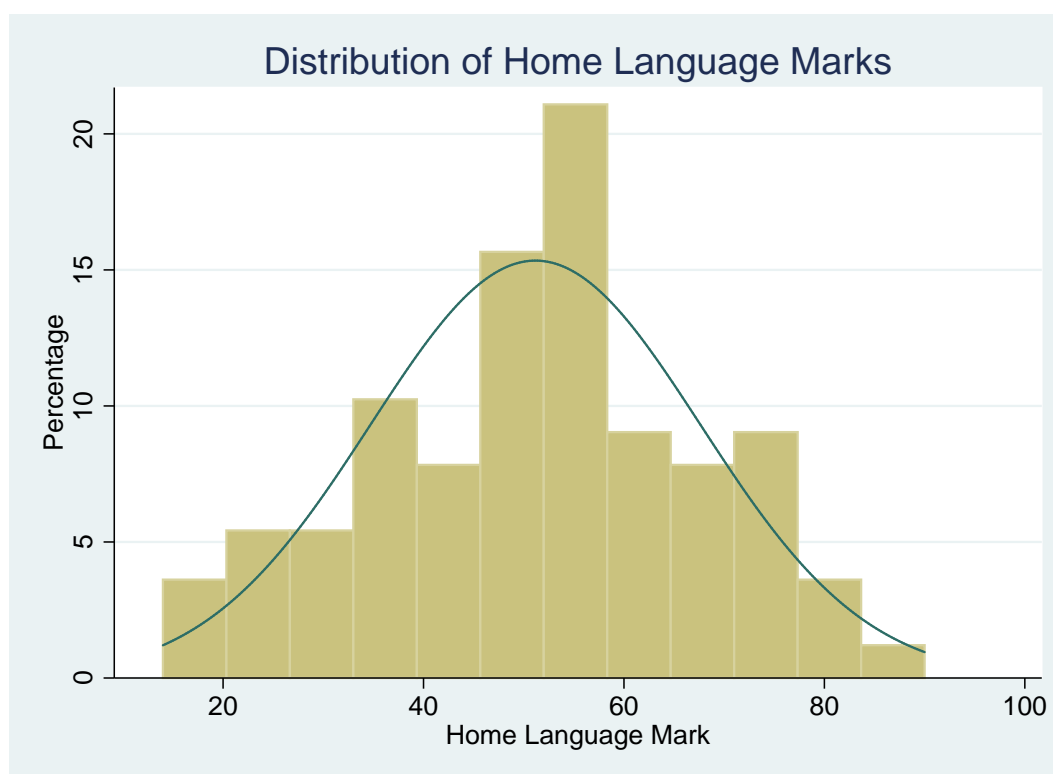


Figure 7.1: Distribution of Home Language Marks with Normal Distribution

Figure 7.2 below indicates the distribution of home language marks for each grade. The median for each grade is shown in the centre of the box, the edges of which denote the 25<sup>th</sup> percentile (on the left) and the 75<sup>th</sup> percentile (on the right). The wicker connects these percentiles to the lower and upper adjacent values

respectively. Outside values are indicated as dots beyond this range. Grade 2 median marks are higher than those for other grades and displays a very large inter quartile range. Grade 1 also displays more outliers in marks.

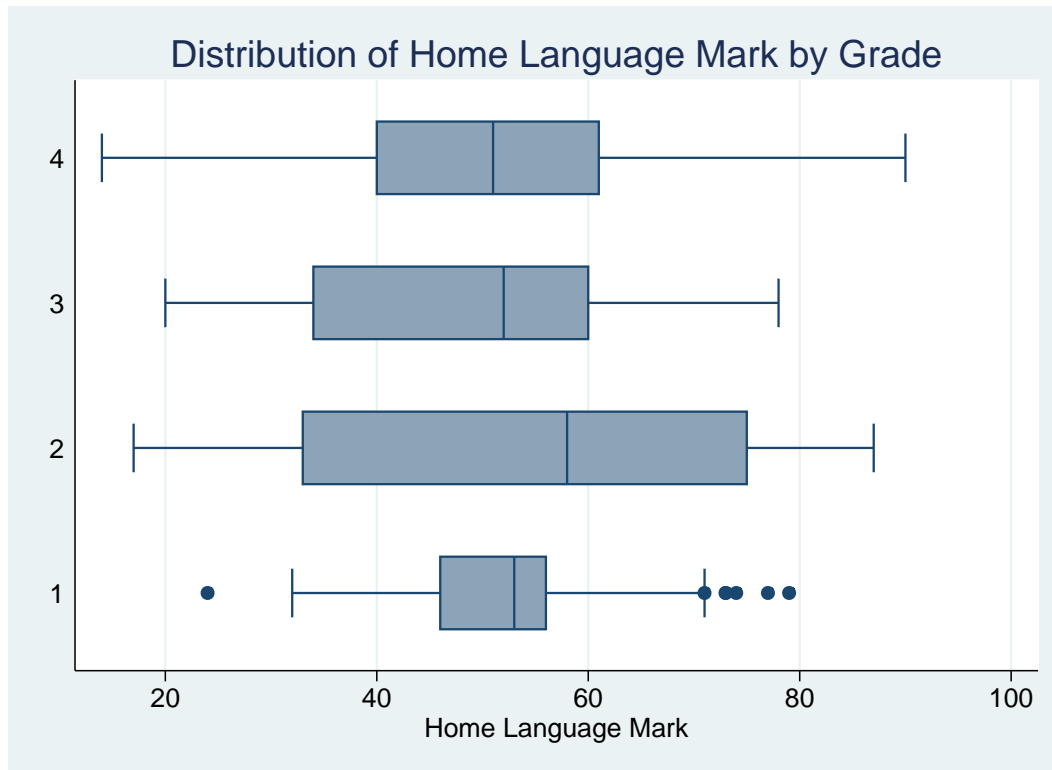


Figure 7.2: Distribution of Home Language Marks by Grade

### b. Mathematics

The Mathematics measure consists of the percentage a learner attained for Maths on their mid-year report as assessed by teachers in accordance with the curriculum. There are 166 observations with a mean of 46.73 and a standard deviation of 17.29. The lowest mark recorded is 7 and the highest is 90. As figure 7.3 below shows, the mathematics marks are not normally distributed, with an adjusted Chi Squared of 5.15 ( $p=0.0760$ ). Learners seem to perform below average in mathematics.

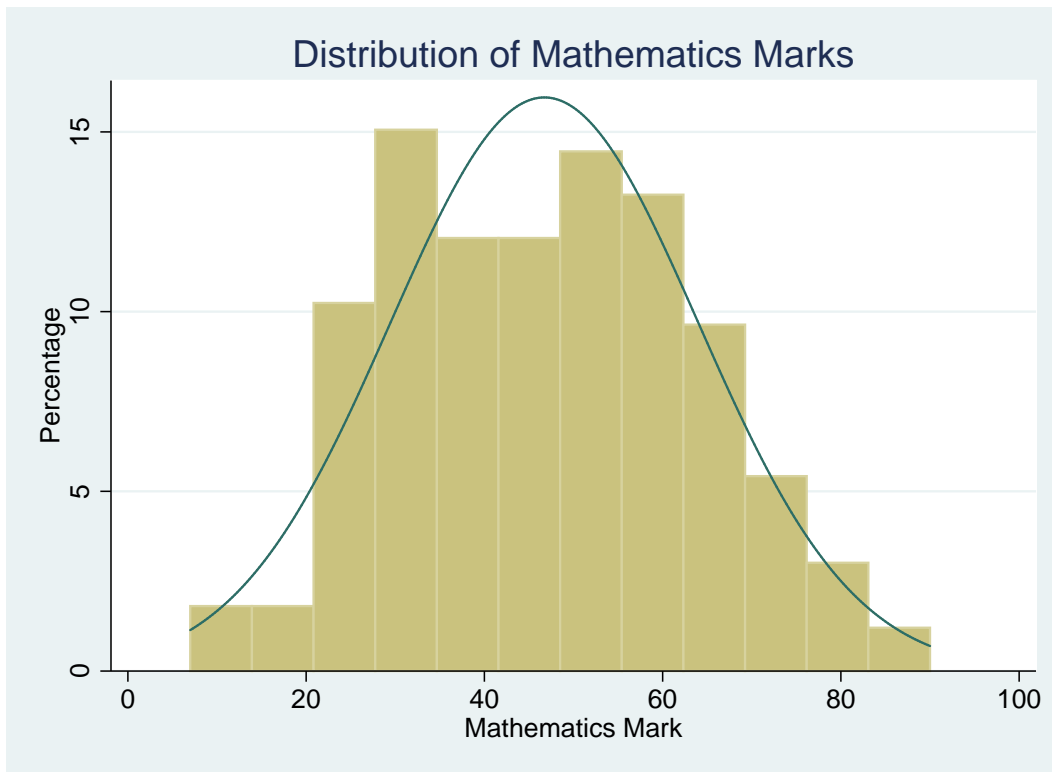


Figure 7.3: Distribution of Mathematics Marks with Normal Distribution

Figure 7.4 below shows the distribution of mathematics marks by grade. The median mark decreases with the progression of grade, with Grade 4 having two positive outliers.

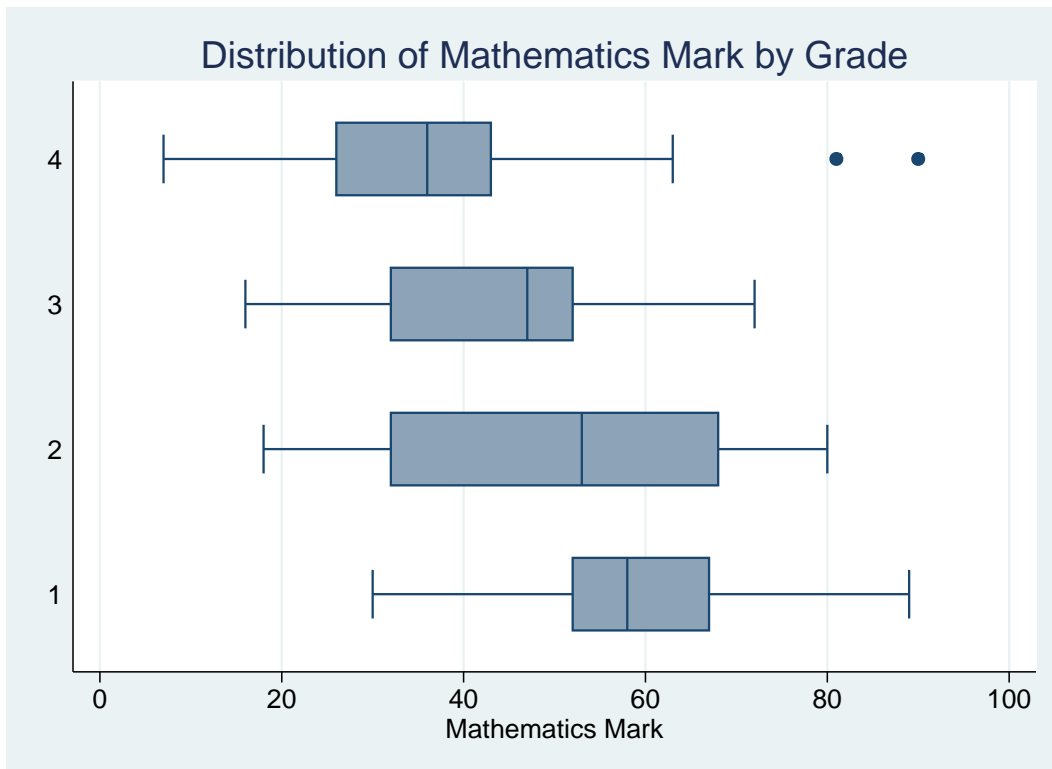


Figure 7.4: Distribution of Mathematics Marks by Grade

The correlation between mathematics and home language marks is depicted in Figure 7.5 below. The correlation coefficient is 0.675, suggesting a strong positive correlation in performance between the two subjects.

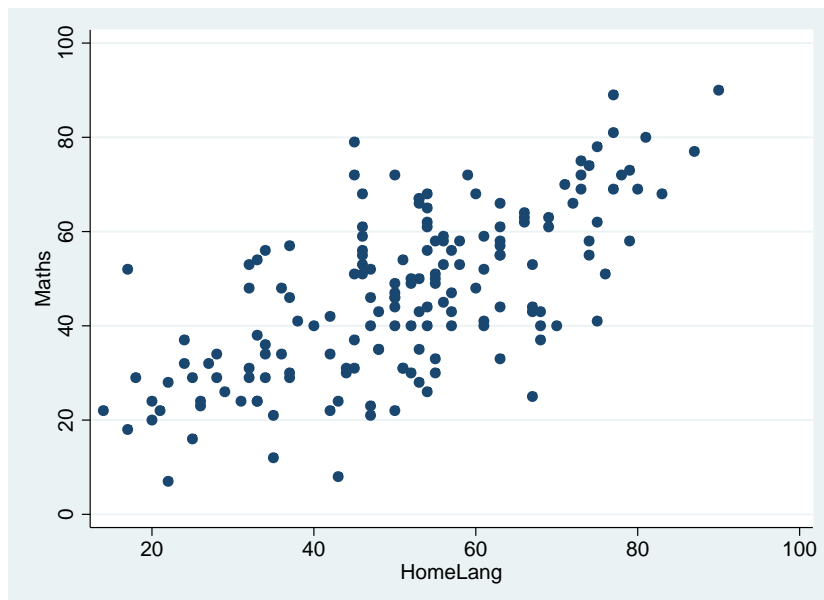
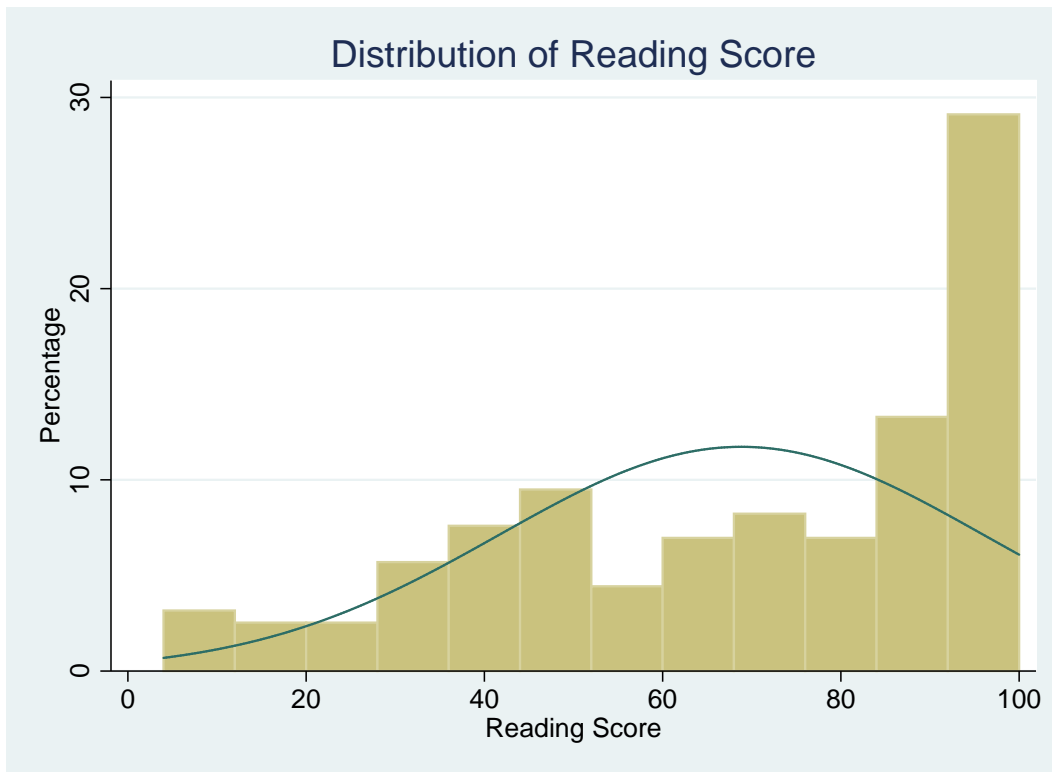


Figure 7.5: Correlation between Mathematics and Home Language Mark

### c. Reading Score

Reading score indicates the percentage of a set list of words that a learner could read without assistance (for a detailed description of this process and the challenges involved see Chapter 6). There are 158 observations, which is less than that for home language and mathematics. This was due to 4 Grade 2 learners reading at Grade 1 level, learners leaving the school, and constant absenteeism. The mean is 68.83 with a standard deviation of 27.22. The lowest reading score recorded was 4, and the highest was 100. As can be seen from Figure 7.6 below, the distribution of reading marks is not normal. The highest frequency of learners attained 100 with some achieving very low marks. The distribution is not normal with an adjusted Chi Squared of 17.49 ( $p=0.002$ ).



*Figure 7.6: Distribution of Reading Score*

As described in Chapter 6, the method used to measure reading score does not make this variable comparable across grades. Figure 7.7 below shows the distribution of reading score by grade. The median reading score decreases with the progression of grade. Most Grade 4 learners scored very highly, but some outliers fall at the bottom of the distribution, the lowest being 3%. This is discussed more fully in Chapter 6.



Figure 7.7: Distribution of Reading Score by Grade

Figure 7.8 shows the correlation between home language mark and reading score. There is a relatively strong positive relationship with a correlation coefficient of 0.5508.

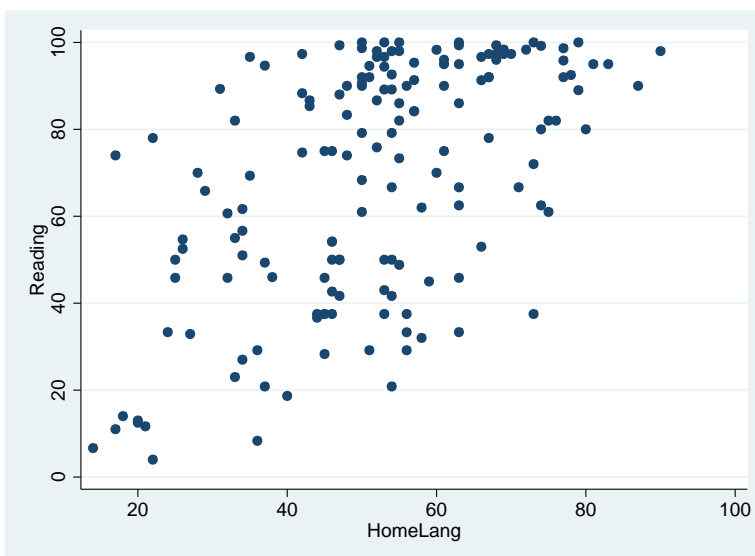


Figure 7.8: Correlation between Home Language Mark and Reading Score

Correlation between mathematics mark and reading score is shown in Figure 7.9. There is almost no correlation, which is reinforced by a correlation coefficient of 0.1263.

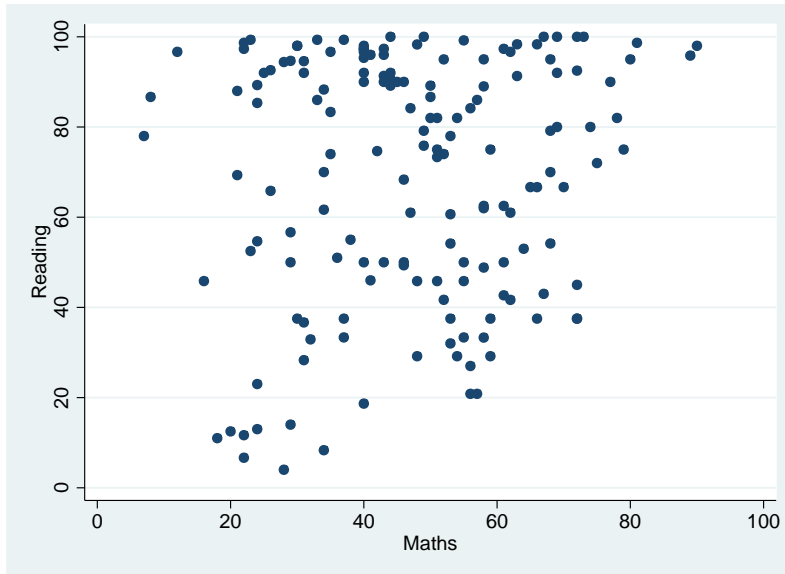


Figure 7.9: Correlation between Mathematics Mark and Reading Score

#### d. Observation of Classroom Behaviour

Classroom behaviour was measured according to the Behavioural Observation of Students in School (BOSS) system on two different occasions, usually with different teachers to remove the teacher and timing effect (see Chapter 6 for a detailed description). In the first round of observations there were 164 data points. This is slightly lower than the number of observations for marks because of absenteeism and learners leaving the school. The mean value was 64.32 with a standard deviation of 11.86. The Lowest value was 31.4 and the highest observed was 93.1. In the second round of observations there were 165 data points with a mean of 60.96 and standard deviation of 12.18. The lowest value observed was 33.3 and the highest was 91.6. As can be seen from Figure 7.10 below the two sets of observations are positively correlated with a correlation coefficient of 0.4717.

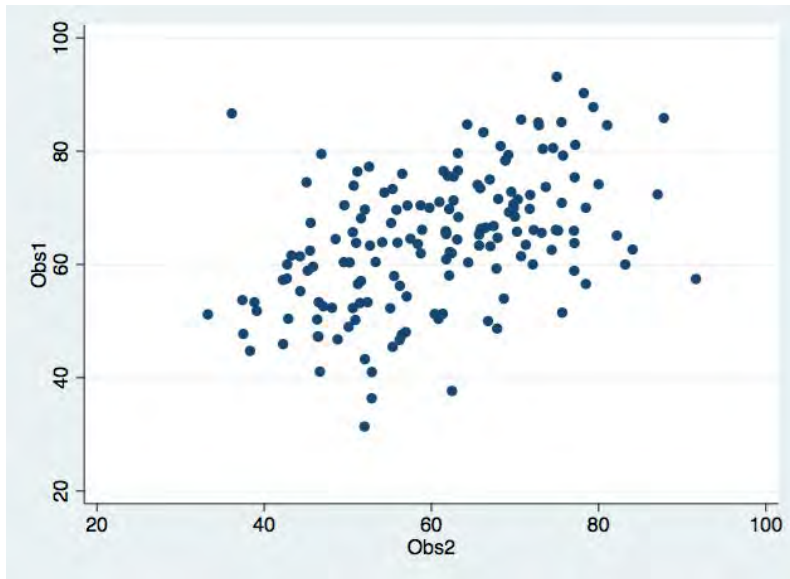


Figure 7.10: Correlation between Observation 1 and Observation 2

A new variable, namely Average Observation was therefore created using the two sets of observation to indicate the classroom behaviour of each learner. It has 165 observations with a mean of 62.73 and standard deviation of 10.28. The lowest observation was 41.5 and maximum observation was 84.8. As figure 7.11 below shows the distribution of classroom behaviour is normal with an adjusted Chi Squared of 5.83 (p=0.0542).

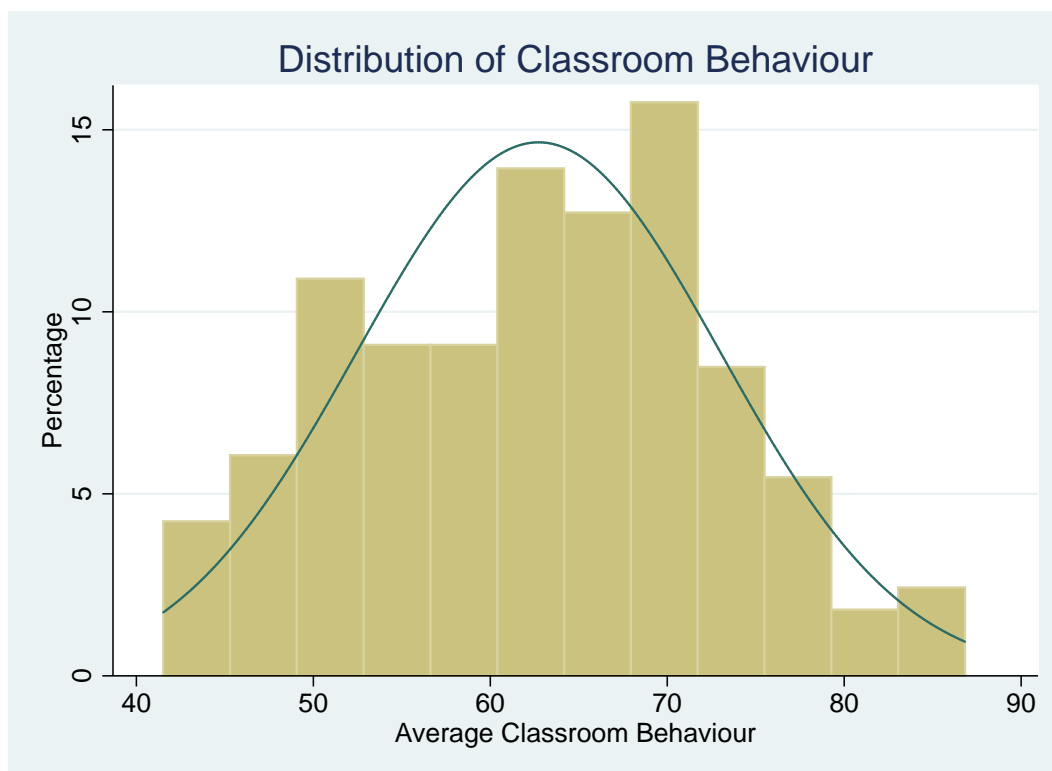
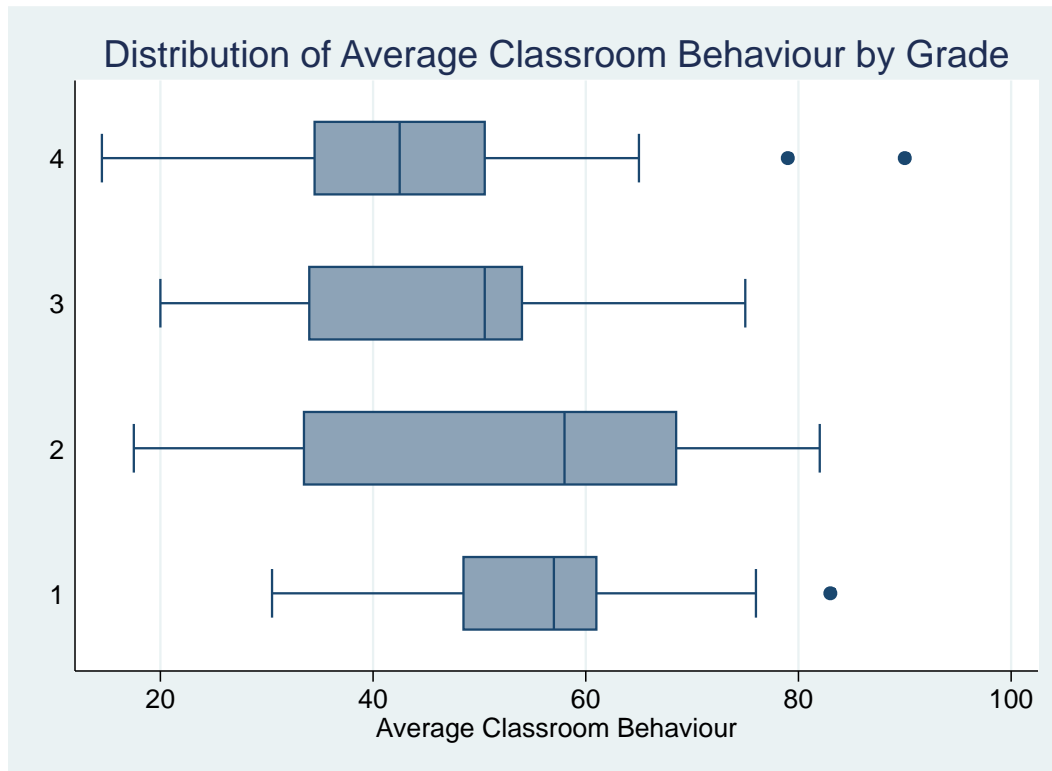


Figure 7.11: Distribution of Classroom Behaviour

Since children are expected to grow and mature with age, a difference in the classroom behaviour scores between grades is expected. Figure 7.12 below depicts the distribution of classroom behaviour by grade. The median behavioural score decreases from Grade 2, although some Grade 4 learners were at the top end of the distribution.



*Figure 7.12: Distribution of Classroom Behaviour by Grade*

The relationship between home language mark and classroom behaviour is shown in Figure 7.13. With a correlation coefficient of 0.3569 this relationship is positive but not strong.

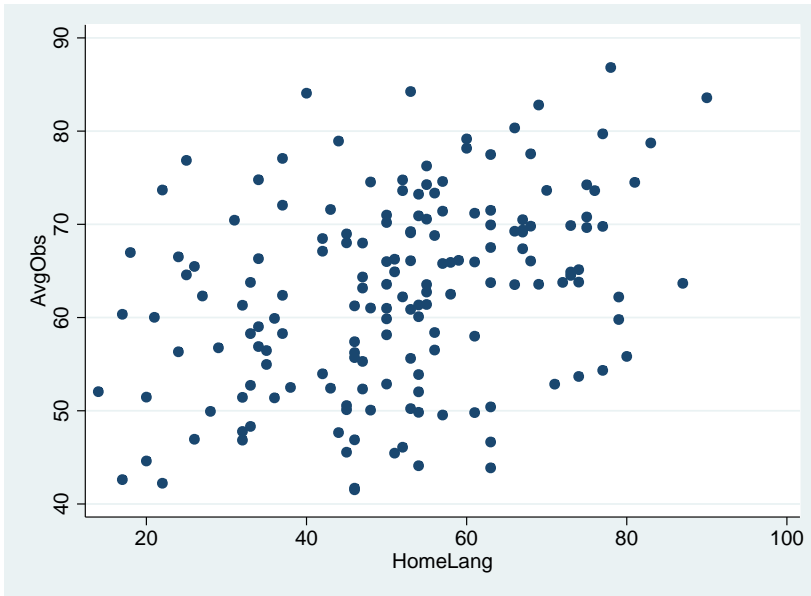


Figure 7.13: Correlation between Home Language Mark and Classroom Behaviour

Mathematics mark's relationship with classroom behaviour is shown in Figure 7.14. There is almost no relationship, with a correlation coefficient of 0.0810.

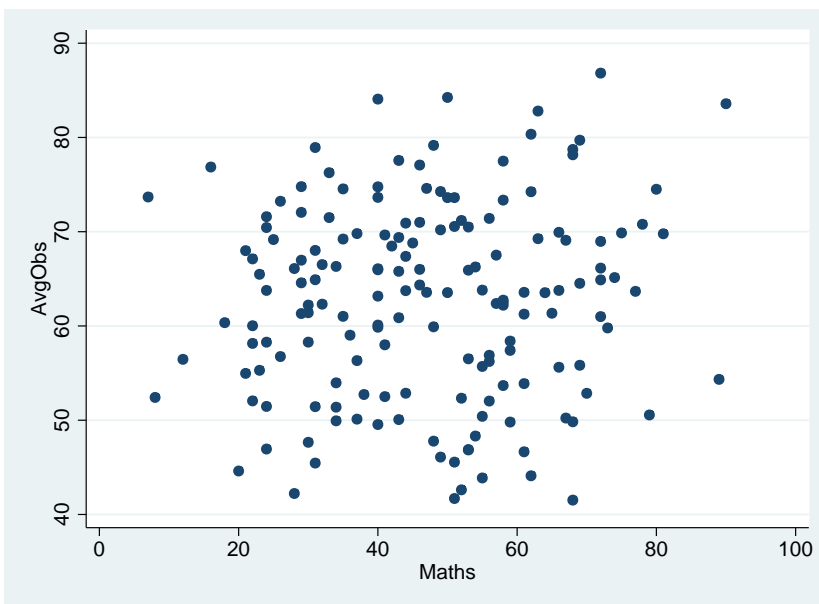


Figure 7.14: Correlation between Mathematics Mark and Classroom Behaviour

Figure 7.15 depicts the relationship between reading score and classroom behaviour. There is a weak though positive relationship with a correlation coefficient of 0.3262.

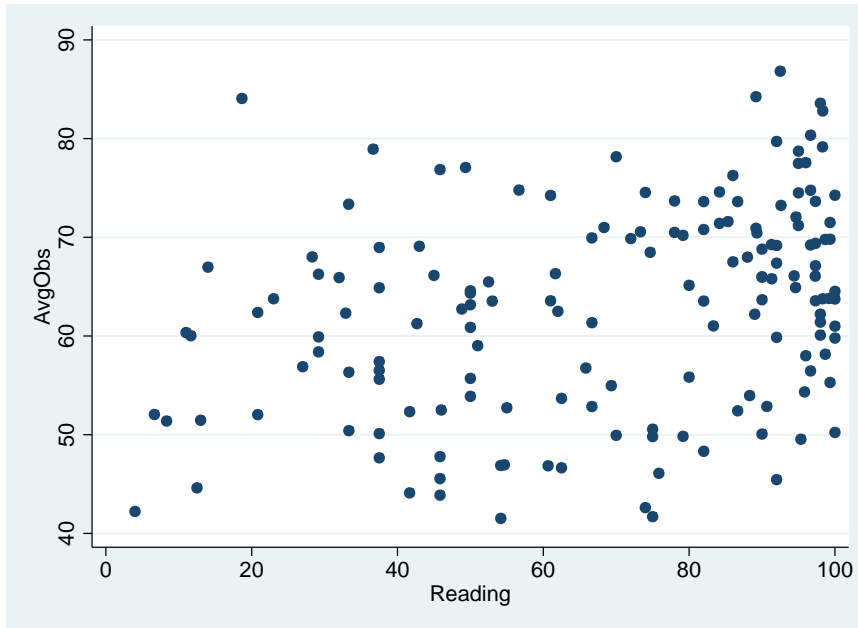


Figure 7.15: Correlation between Reading Score and Classroom Behaviour

#### e. FAS

FAS denotes a dummy variable indicating whether a specific learner has been diagnosed with FAS (see Chapter 6 for the diagnosis procedure). A value of 1 indicates a learner who has been diagnosed and 0 if not. Of the 166 observations 21 learners (12.35%) were diagnosed with FAS (percentages shown in Figure 7.16 below): 7 in Grade 1 (16.37% of the grade); 6 in Grade 2 (16.22% of the grade); 3 in Grade 3 (9.09% of the grade); and 5 in Grade 4 (9.26% of the grade).

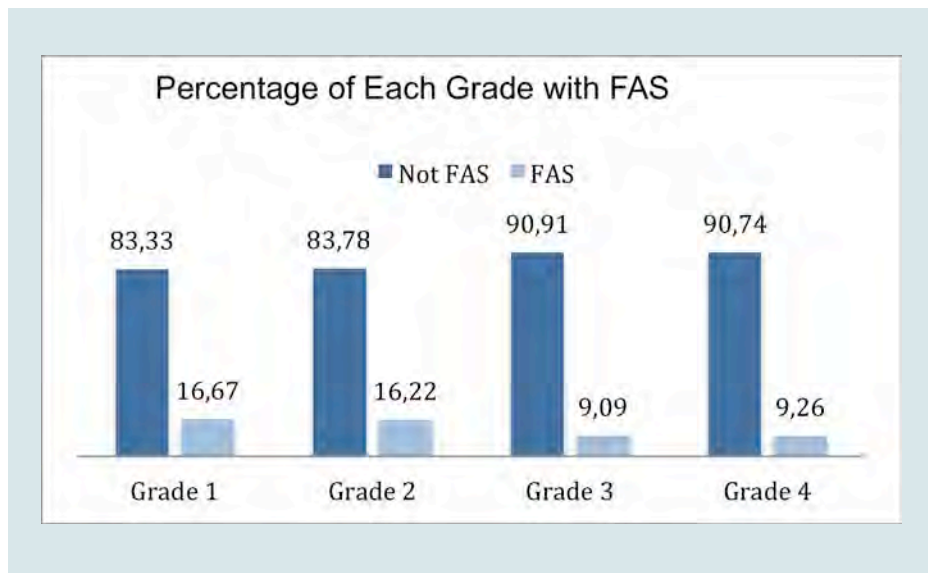


Figure 7.16: Percentage of Each Grade with FAS

#### f. Number of Days Absent

The number of days absent measures how many school days a specific learner missed during the first half of 2015, as per their official record. There were 166

observations with a mean of 4.34 days and a standard deviation of 6.11. The lowest number of days absent was zero, and the highest 28 days. As Figure 7.17 below shows, the majority of learners were never absent with only a small number being absent more than 10 days in the period.

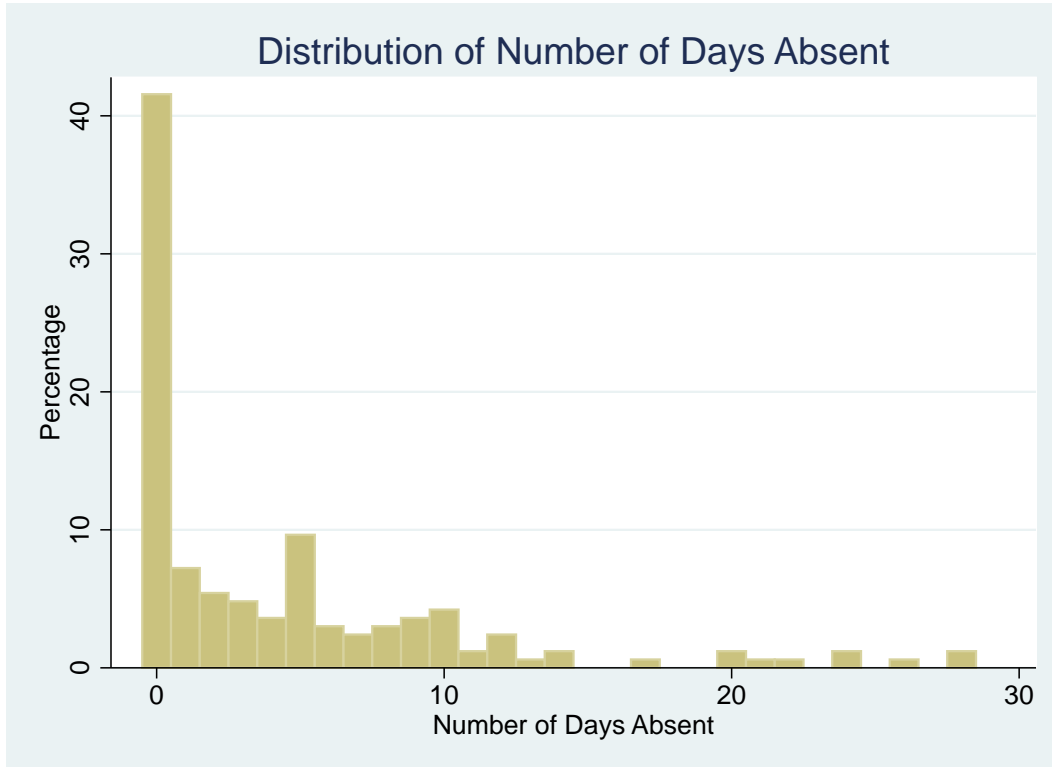


Figure 7.17: Distribution of Days Absent

The distribution of absenteeism by grade is shown in Figure 7.18. It shows that learners are more absent in the younger grades. Because of the small sample size absenteeism may be due to individual learners being sick for extended periods of time rather than a trend. For example, a Grade 4 learner missed a considerable amount of school time because of treatment for Tuberculosis.

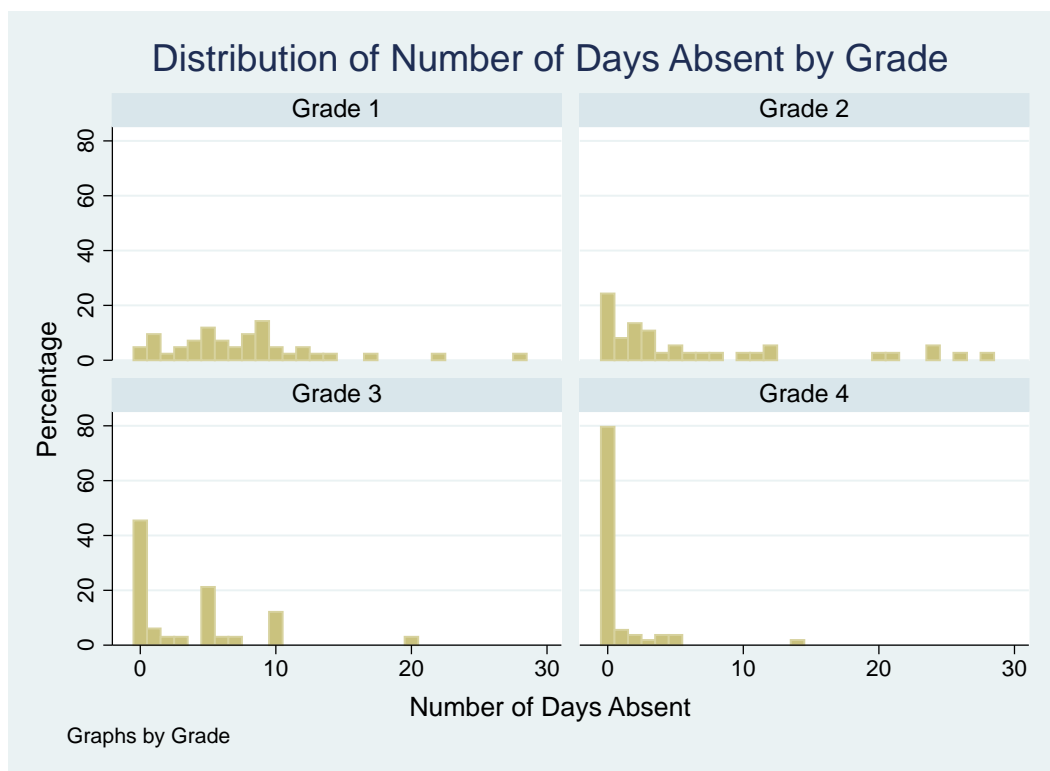


Figure 7.18: Distribution of Number of Days Absent by Grade

The correlation coefficient between days absent and FAS is very low at 0.0351, indicating that learners with FAS are not necessarily absent from school more often. Similarly, the correlation coefficient between days absent and boarding is 0.0283, indicating that those learners who are in the boarding house are not more likely to be absent.

#### g. Farm

Farm denotes a dummy variable indicating whether a learner lives on a farm ( $f=1$ ) or in town ( $f=0$ ). There are 166 observations with 105 (63.25%) living on farms.

The percentage of learners in each grade living on a farm is shown in Figure 7.19. In Grade 1 has almost 50-percentage point more learners living on a farm than in town, whilst Grade 2 has almost 20-percentage point more learners living on a farm than in town. Grade 3 has almost one third of learners living in town and two thirds of learners living on a farm. In Grade 4 the split is very close to equal (53.70% from the farm and 46.30% from the town). Since there is a school in town, the department has encouraged EFPS to focus on accepting learners from the farms when they enter school.

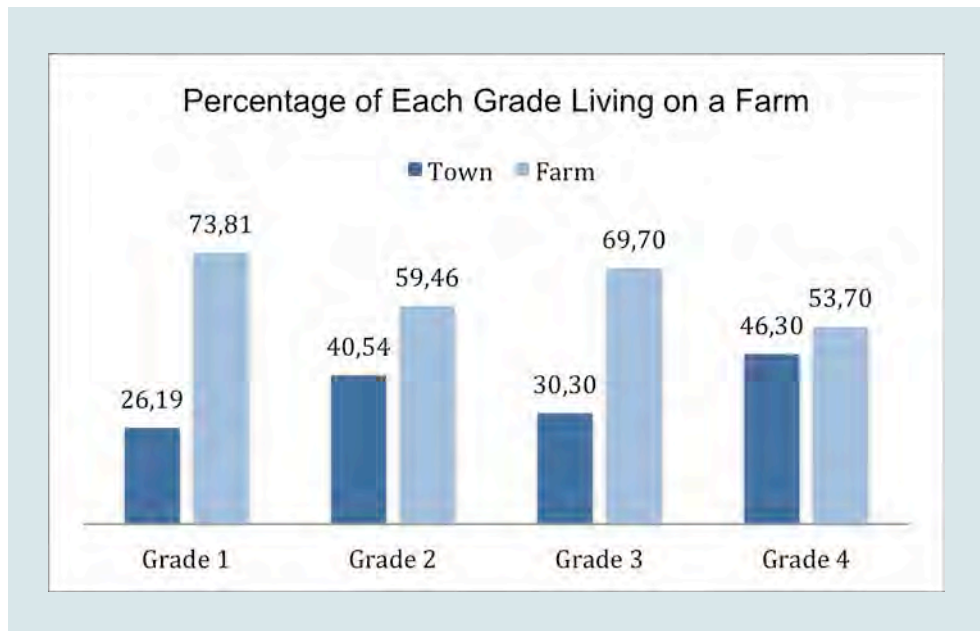


Figure 7.19: Percentage of Each Grade Living on a Farm

The correlation coefficient between living on a farm and FAS is 0.1397, which means that a child with FAS is not necessarily more likely to be living on a farm than in town.

#### h. Boarding

Boarding is a dummy variable denoting whether a child lives at home ( $b=0$ ) or in the boarding house ( $b=1$ ) during the week. Of the 166 observations 109 (65.66%) are in the boarding house.

Within each grade, the percentage boarding is shown in Figure 7.20. In all grades there are more boarders than day learners, but the biggest difference is in Grade 4 where  $\frac{2}{3}$  of the Grade are in boarding, a much higher proportion than those who live on farms. This is in keeping with the school's policy to have older pupils in boarding. Grade 1 also has a high percentage of boarders, which may be due to more farm children in this grade, although it is evident that some farm pupils still live at home in the younger grades. The correlation coefficient between living on a farm and boarding is 0.3127, adding to the impression that there is more influencing whether a child boards than purely distance from school.

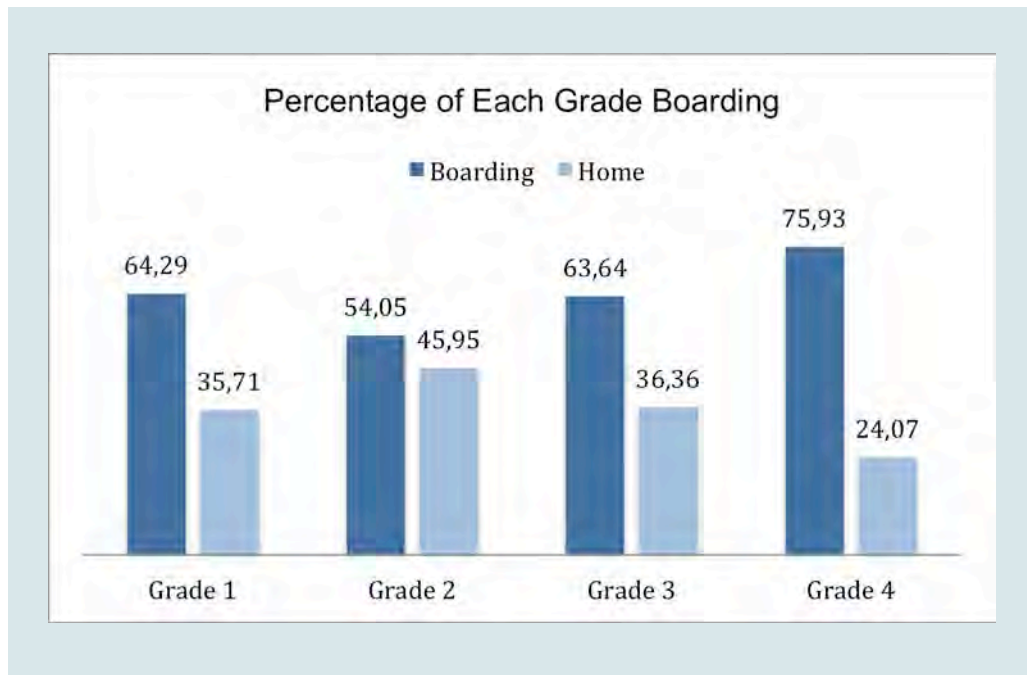


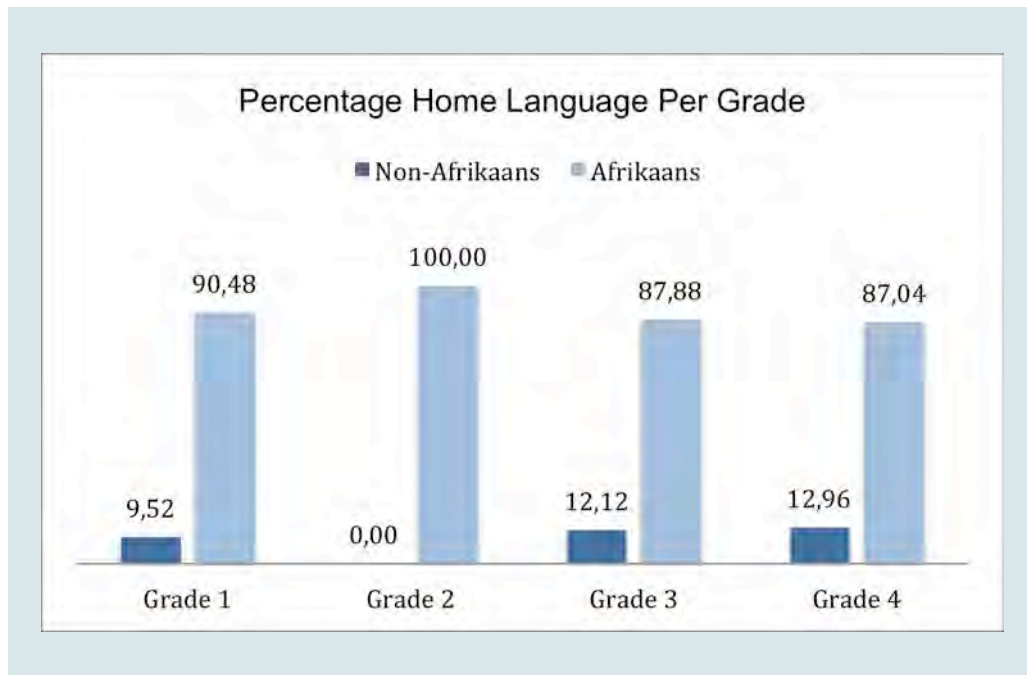
Figure 7.20: Percentage of Each Grade Boarding

The correlation coefficient between FAS and boarding is 0.1989, which is quite low, indicating that a child with FAS is not more likely to be in the boarding house. This could be because a number of children with FAS are in foster care, see Frank's story in Chapter 3.

#### i. Afrikaans as Home Language

Afrikaans as home language is a dummy variable taking on a value of 1 if it is a learner's mother tongue and 0 if they speak a different language at home. Of the 166 observations 151 (90,96%) speak Afrikaans at home, with only 15 learners having a different home language.

The breakdown of home language per grade is shown in Figure 7.21. Grade 1 has very few non-home language learners and Grade 2 has none. Grade 3 and 4 have similar percentages of non-home language learners.



*Figure 7.21: Percentage Home Language Per Grade*

The correlation coefficient between FAS and Afrikaans as Home Language is 0.1199, which is very low. This means that there is not much relationship between a child's home language and their diagnosis as living with FAS.

#### **j. Too Old for the Grade**

Being too old for the grade shows the difference between the standard age for a grade at the beginning of the year (6 for Grade 1, 7 for Grade 2, 8 for Grade 3 and 9 for Grade 4) and the learner's biological age on 1 January 2015. The mean years too old were 0.92 with a standard deviation of 0.81. The minimum was zero, in other words the correct age for the grade, and the maximum was 3. As figure 7.22 shows, the majority of learners are one year too old for the grade, reflecting adherence to the rule that a child may only fail once per phase (See Chapter 4).

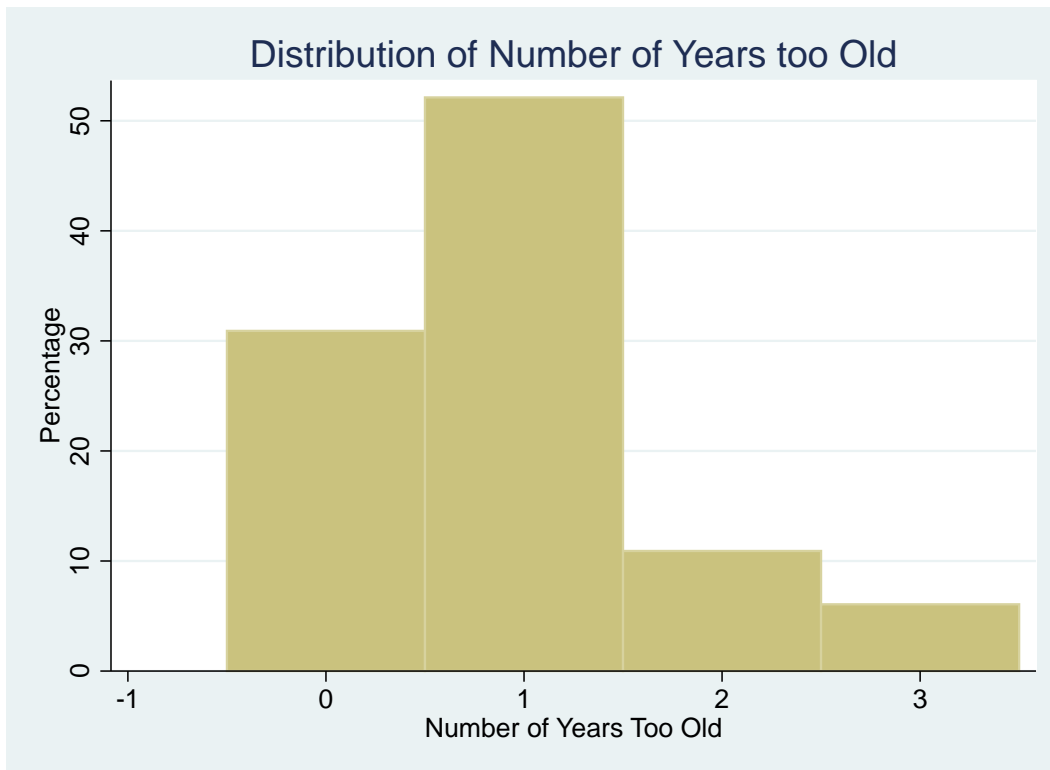


Figure 7.22: Distribution of the Number of Years a Learner is Too Old

The distribution of years too old by grade is shown in Figure 7.23. This once again shows that learners in Grade 1, 2 and 3 may only be one year too old, where learners in Grade 4 can also be 2 or 3 years too old. This is discussed in Chapter 4.

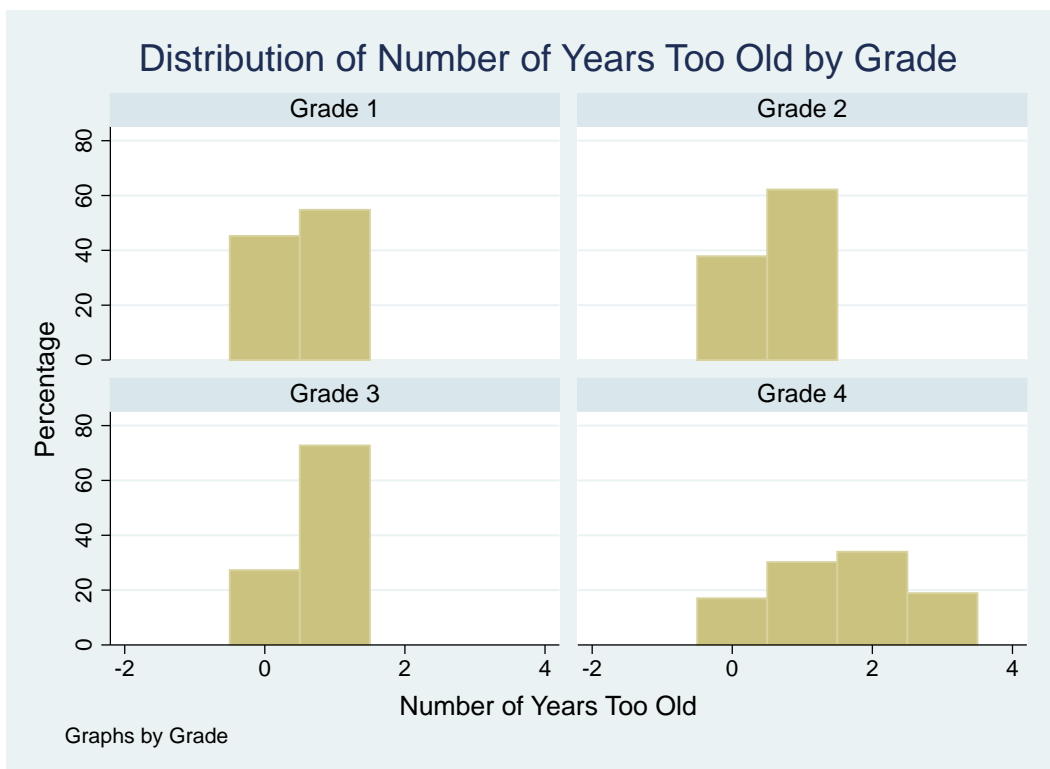


Figure 7.23: Number of Years Too Old by Grade

The correlation coefficient between FAS and the number of years a child is too old for the grade is 0.0147, which is very low. This may be as a result of the high number of new Grade 1 learners who have FAS or learners simply being pushed through the system.

#### k. Sex

Sex is a dummy variable indicating whether a learner is male ( $s=1$ ) or female ( $s=0$ ). Of the 166 observations 94 were male (56.66%). Figure 24 show what percentage of each grade is male and female. As can be seen all grades apart from Grade 3 have higher percentages of males.

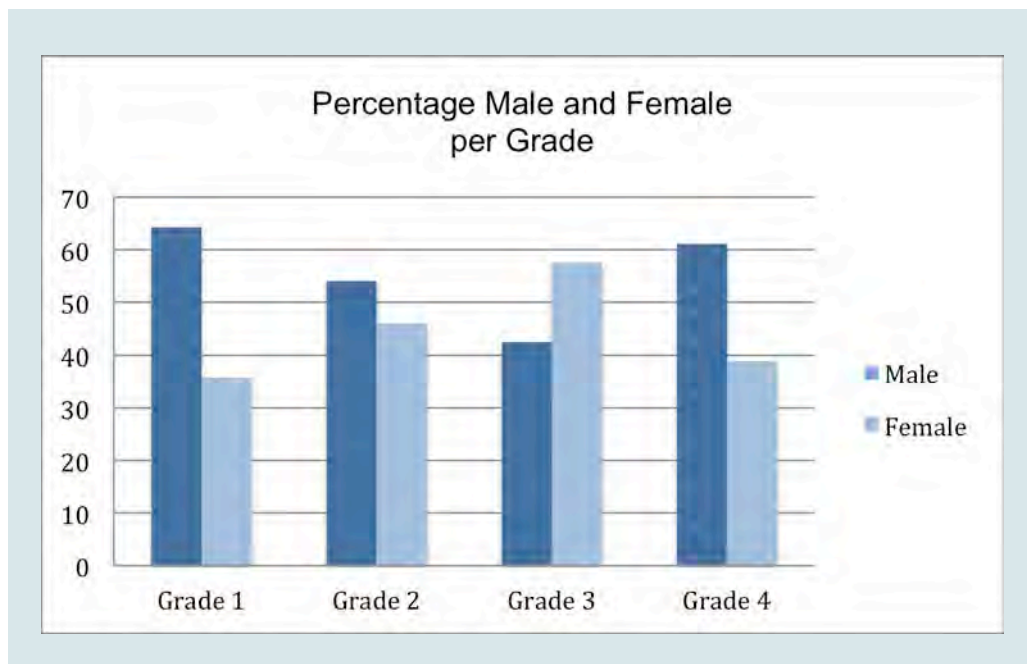


Figure 7.24: Percentage Male and Female per Grade

The correlation coefficient between FAS and sex is -0.0326, which is very weak. This means that there is almost no difference in diagnosis of FAS between boys and girls.

## Chapter 8: Regression Analysis

Comprehensive regressions using the data collected were run using Stata 13. The influence of FAS on each identified educational outcome (home language mark, mathematics mark, reading score and classroom behaviour) was examined first. This, however, does not take into consideration the numerous other factors of influence identified by teachers. Grade was included as a categorical variable in subsequent regressions. Other explanatory variables (including reading ability and classroom behaviour) were added systematically to determine their explanatory value. A comprehensive regression was then run, after which all non-statistically significant variables were dropped to give the best regression. Interaction terms between FAS and Grade were included to determine whether the impact of FAS changes as a learner moves through the school.

### a. Home Language Mark

As explained in Chapter 6, home language mark refers to the half-year mark a learner received on their report. Regression 1 (table 8.1) indicates the impact of FAS on the home language mark when not controlling for other factors, and shows that a learner with FAS scores on average 7.23 percentage points less than their peers at a 10% level of significance. Grade (regression 2) does not have a statistically significant influence on home language marks, indicating that language ability increases in line with the difficulty of assessments.

The number of days a learner is absent from school (regression 3), whether a learner lives on a farm or in town (regression 4), or whether Afrikaans is their home language (regression 6) do not have a significant impact on home language marks. The positive work Bushmans Kloof (who employ primarily non-Afrikaans speaking workers) does may influence the lack of impact of living on a farm and Afrikaans as home language (see Chapter 3). Since the sample is small a strong learner who is absent for an extended period of time may overshadow the impact of others missing school.

If a learner lives in the boarding house their home language mark is on average 5.21 percentage points lower, at a 10% level of significance, than that of a learner who lives at home (regression 5). This is more likely an indication of adverse home circumstances the school attempts to remove them from, rather than a negative impact of the boarding house itself. For every year a learner is too old for the grade (regression 7) their average home language mark decreases by 6.97 percentage points at a 1% level of significance, indicating that repeating a grade or being held back does not improve a learner's mark. Repeating is indicative of something else, such as low IQ, which influences marks. This should not be interpreted as saying that not repeating would be a better option.

Girls achieve on average a 9.62 percentage points higher home language marks than boys at a 1% level of significance (regression 8). Reading ability has a significant effect on home language mark, with an average increase of 0.46 percentage points for every percentage point increase in reading score (at a 1% level of significance). Similarly, for every percentage point increase in classroom behaviour (regression 10) home language mark is expected to increase by 0.75 percentage points at a 1% level of significance.

Regression 11 is the fully specified model, from where all non-significant variables and classroom behaviour (as it dilutes the effect of FAS which impacts on both home language mark and classroom behaviour) were removed, to produce regression 12. This shows that FAS, Grade, number of years too old, sex and reading score have significant impacts on home language marks. It should be noted that FAS has an impact on many of the independent variables, i.e. learners with FAS tend to have below average marks, reading ability and behaviour. By including all these variables in the regression the full effect of FAS is diluted. Despite this, the impact of FAS is significant at a 5% level.

Table 8.1: Regressions of Effect on Home Language Mark

Regressions of Effects on Home Language														
	R2	Costant	FAS	Grade 2	Grade 3	Grade 4	Days Absent	Farm	Boarding	Afrikaans	Years too Old	Sex	Reading	Behaviour
<b>Regression 1</b>	0,0214	52,08	-7,23											
<b>Std Error</b>		1,36	3,82											
<b>p stat</b>		0,000	0,060											
<b>Regression 2</b>	0,0404	53,67	-8,03	1,74	-3,91	-3,37								
<b>Std Error</b>		2,58	3,84	3,69	3,80	3,37								
<b>p stat</b>		0,000	0,038	0,638	0,306	0,318								
<b>Regression 3</b>	0,0458	51,98	-7,99	1,92	-3,01	-1,86	0,22							
<b>Std Error</b>		3,13	3,84	3,69	3,92	3,72	0,24							
<b>p stat</b>		0,000	0,039	0,603	0,445	0,618	0,344							
<b>Regression 4</b>	0,0422	54,71	-7,74	1,52	-3,96	-3,65		-1,46						
<b>Std Error</b>		3,22	3,89	3,72	3,81	3,41		2,70						
<b>p stat</b>		0,000	0,048	0,684	0,301	0,286		0,590						
<b>Regression 5</b>	0,0614	56,79	-6,41	1,13	-3,86	-2,68			-5,21					
<b>Std Error</b>		3,04	3,91	3,67	3,77	3,36			2,76					
<b>p stat</b>		0,000	0,103	0,758	0,308	0,425			0,061					
<b>Regression 6</b>	0,0434	50,82	-8,31	1,45	-3,84	-3,28				3,20				
<b>Std Error</b>		4,79	3,87	3,72	3,81	3,37				4,52				
<b>p stat</b>		0,000	0,033	0,697	0,315	0,333				0,481				
<b>Regression 7</b>	0,1236	57,35	-7,07	2,21	-2,61	3,55					-6,97			
<b>Std Error</b>		2,66	3,70	3,55	3,67	3,72					1,80			
<b>p stat</b>		0,000	0,058	0,534	0,479	0,341					0,000			
<b>Regression 8</b>	0,1224	59,93	-8,55	0,78	-6,04	-3,70						-9,62		
<b>Std Error</b>		2,96	3,69	3,55	3,69	3,23						2,49		
<b>p stat</b>		0,000	0,022	0,826	0,104	0,253						0,000		
<b>Regression 9</b>	0,5294	29,29	-5,54	1,64	13,44	-17,65							0,46	
<b>Std Error</b>		2,67	2,81	2,75	2,77	2,63							0,04	
<b>p stat</b>		0,000	0,050	0,552	0,000	0,000							0,000	
<b>Regression 10</b>	0,2168	11,87	-5,50	-4,50	-13,81	-9,77								0,75
<b>Std Error</b>		7,48	3,51	3,56	3,83	3,23								0,13
<b>p stat</b>		0,115	0,119	0,208	0,000	0,003								0,000
<b>Regression 11</b>	0,6318	12,75	-2,92	-2,81	-17,13	-15,44	0,14	-0,52	-2,90	-0,58	-3,11	-1,54	0,41	0,43
<b>Std Error</b>		7,26	2,69	2,70	2,86	3,11	0,16	1,94	2,02	2,99	1,30	1,88	0,04	0,10
<b>p stat</b>		0,081	0,280	0,300	0,000	0,000	0,388	0,789	0,153	0,846	0,018	0,413	0,000	0,000
<b>Regression 12</b>	0,5773	35,40	-5,43	1,48	-13,07	-13,31					-3,74	-4,01	0,43	
<b>Std Error</b>		3,08	2,70	2,64	2,69	2,90					1,30	1,86	0,04	
<b>p stat</b>		0,000	0,046	0,575	0,000	0,000					0,004	0,033	0,000	

### **b. Mathematics Marks**

Mathematics mark (table 8.2) refers to the half-year mark a learner receives on their report (Chapter 6). Regression 1 indicates that although FAS has a negative impact on mathematics marks when no other variables are controlled for, it is not statistically significant; this may be because all learners struggle with mathematics, resulting in the influence of FAS being overshadowed.

Once again grade is included in all future regressions. Mathematics marks decrease with grade progression (regression 2). In comparison to a Grade 1 learner, a Grade 2 learner receives on average 7.6 fewer percentage points, a Grade 3 learner 14.9 fewer percentage points, and a Grade 4 learner 21.61 fewer percentage points. Since mathematics is not an intuitive subject like language, which is learnt from birth, a firm foundation is required for more complex terms to be understood, which is not reflected by these results.

The number of days a learner is absent from school (regression 3), whether they live on a farm or in the town (regression 4), whether their home language is Afrikaans (regression 6) and their sex (regression 8) are not statistically significant. The rationale for these influences are the same as described for home language, though the insignificance of the variable sex means that girls do not outperform boys in mathematics as they do in other educational outcomes.

Boarders achieve on average 7.6 fewer percentage points for mathematics (regression 5), significant at a 1% level, attributable to the negative influence of the home environment from which they are removed. For every year a learner is too old for their grade (regression 7) their average mathematics mark is expected to decrease by 4.0 percentage points which is significant at a 5 % level. This may be because it is correlated with ability, which influences both performance and how many years a learner must repeat. Reading score and classroom behaviour are statistically significant at a 1% level (regressions 9 and 10). A percentage point increase in reading score or classroom behaviour is associated with a 0.30 and 0.49 percentage point increase in mathematics mark respectively.

The comprehensive regression 11 shows that the only significant variables are grade, boarding, reading score, and behaviour. These (and FAS for comparative purposes) were retained to form regression 12.

Table 8.2: Regressions of Effects on Mathematics Mark

Regressions of Effects on Mathematics														
	R2	Costant	FAS	Grade 2	Grade 3	Grade 4	Days Absent	Farm	Boarding	Afrikaans HL	Years too Old	Sex	Reading	Behaviour
<b>Regression 1</b>	0,0035	47,12	-3,07											
<b>Std Error</b>		1,44	4,04											
<b>p stat</b>		0,000	0,449											
<b>Regression 2</b>	0,2454	59,08	-5,22	-7,60	-14,91	-21,61								
<b>Std Error</b>		2,40	3,58	3,43	3,54	3,13								
<b>p stat</b>		0,000	0,146	0,028	0,000	0,000								
<b>Regression 3</b>	0,2454	59,01	-5,22	-7,60	-14,87	-21,55	0,01							
<b>Std Error</b>		2,93	3,59	3,45	3,66	3,48	0,22							
<b>p stat</b>		0,000	0,148	0,029	0,000	0,000	0,967							
<b>Regression 4</b>	0,2532	61,37	-4,57	-8,10	-15,01	-22,23		-3,23						
<b>Std Error</b>		2,98	3,60	3,45	3,54	3,16		2,50						
<b>p stat</b>		0,000	0,206	0,020	0,000	0,000		0,199						
<b>Regression 5</b>	0,2640	63,65	-2,83	-8,50	-14,83	-20,61			-7,64					
<b>Std Error</b>		2,79	3,58	3,36	3,46	3,07			2,52					
<b>p stat</b>		0,000	0,430	0,012	0,000	0,000			0,003					
<b>Regression 6</b>	0,2454	59,06	-5,22	-7,61	-14,91	-21,61				0,02				
<b>Std Error</b>		4,47	3,61	3,46	3,55	3,15				4,22				
<b>p stat</b>		0,000	0,149	0,030	0,000	0,000				0,996				
<b>Regression 7</b>	0,2732	61,18	-4,61	-7,34	-14,16	-17,83					-3,99			
<b>Std Error</b>		2,54	3,54	3,39	3,51	3,55					1,72			
<b>p stat</b>		0,000	0,194	0,032	0,000	0,000					0,021			
<b>Regression 8</b>	0,2490	60,46	-5,33	-7,82	-15,38	-21,69						-2,12		
<b>Std Error</b>		2,87	3,58	3,44	3,58	3,14						2,42		
<b>p stat</b>		0,000	0,138	0,025	0,000	0,000						0,382		
<b>Regression 9</b>	0,4569	43,40	-4,15	-5,49	-21,01	-30,78							0,30	
<b>Std Error</b>		3,09	3,22	3,16	3,17	0,04							0,04	
<b>p stat</b>		0,000	0,198	0,084	0,000	0,000							0,000	
<b>Regression 10</b>	0,3176	31,63	-3,60	-11,58	-21,41	-25,82								0,49
<b>Std Error</b>		7,35	3,45	3,50	3,76	3,17								0,13
<b>p stat</b>		0,000	0,297	0,001	0,000	0,000								0,000
<b>Regression 11</b>	0,5267	32,01	0,14	-9,64	-24,60	-32,09	-0,04	-1,27	-6,46	-4,09	-1,02	3,02	0,28	0,35
<b>Std Error</b>		8,78	3,26	3,26	3,46	3,76	0,20	2,35	2,44	3,62	1,57	2,27	0,04	0,12
<b>p stat</b>		0,000	0,967	0,004	0,000	0,000	0,853	0,588	0,009	0,261	0,518	0,185	0,000	0,004
<b>Regression 12</b>	0,5082	31,31	-1,13	-9,65	-24,49	-31,71			-6,40				0,27	0,31
<b>Std Error</b>		6,50	3,18	3,23	3,30	2,97			2,18				0,04	0,11
<b>p stat</b>		0,000	0,723	0,003	0,000	0,000			0,004				0,000	0,006

### c. Reading Score

Reading score (table 8.3) was constructed by determining what percentage of a teacher-determined list of words a learner could read without assistance (see Chapter 5). Since the selection and presentation of words was not consistent across grades results should be interpreted with care. Of interest are comparisons between results on reading score and other educational outcomes.

Regression 1 shows that the negative impact of FAS on reading is not statistically significant at a 10% level, but it is significant at a 20% level. Since teachers allocated the words to be tested, reading score is not comparable across grades, necessitating the inclusion of grade in all subsequent regressions. Regression 2 shows that, apart from Grade 2, reading scores are significantly different by grade. The sustained increase after this shows that learners do improve their reading ability.

Once again the number of days a learner is absent from school (regression 3), whether a learner lives on a farm or in town (regression 4), whether they live in the boarding house or at home (regression 5), if Afrikaans is their home language (regression 6), and how many years they are too old for the grade (regression 7) do not have a statistically significant impact.

The effect of a learner's sex (regression 8) shows that a girl is expected to receive 9.7 percentage points more than a boy at a 5% level of significance. This is in line with results found on the home language marks and indicates a stronger language ability of girls in this sample. For every percentage point increase in classroom behaviour, reading mark is expected to increase by 0.60-percentage points (regression 9), significant at a 1% level.

All explanatory variables are included in regression 10, which shows that regression 9, with grade and classroom behaviour is the most useful in understanding the topic.

Table 8.3: Regressions of Effects on Reading Score

Regressions of Effects on Reading Score													
	R2	Costant	FAS	Grade 2	Grade 3	Grade 4	Days Absent	Farm	Boarding	Afrikaans HL	Years too Old	Sex	Behaviour
<b>Regression 1</b>	0,0123	69,94	-9,24										
<b>Std Error</b>		2,30	6,64										
<b>p stat</b>		0,000	0,166										
<b>Regression 2</b>	0,2240	53,03	-6,55	8,91	20,66	30,96							
<b>Std Error</b>		3,86	5,99	5,85	5,68	5,03							
<b>p stat</b>		0,000	0,275	0,130	0,000	0,000							
<b>Regression 3</b>	0,2267	50,97	-6,61	9,11	21,77	32,81	0,27						
<b>Std Error</b>		4,80	6,00	5,87	5,89	5,65	0,38						
<b>p stat</b>		0,000	0,272	0,123	0,000	0,000	0,470						
<b>Regression 4</b>	0,2243	52,34	-6,77	9,08	20,70	31,16		0,95					
<b>Std Error</b>		4,92	6,08	5,92	5,70	5,13		4,16					
<b>p stat</b>		0,000	0,312	0,127	0,000	0,000		0,821					
<b>Regression 5</b>	0,2243	53,58	-6,26	8,74	20,67	31,08			-0,92				
<b>Std Error</b>		4,63	6,16	5,93	5,70	5,08			4,26				
<b>p stat</b>		0,000	0,312	0,143	0,000	0,000			0,829				
<b>Regression 6</b>	0,2277	47,95	-7,07	8,40	20,77	31,13				5,70			
<b>Std Error</b>		7,13	6,02	5,89	5,69	5,04				6,72			
<b>p stat</b>		0,000	0,242	0,156	0,000	0,000				0,397			
<b>Regression 7</b>	0,2331	55,11	-6,08	9,00	20,77	31,13					-3,98		
<b>Std Error</b>		4,13	6,00	5,85	5,69	5,04					2,80		
<b>p stat</b>		0,000	0,312	0,126	0,000	0,000					0,158		
<b>Regression 8</b>	0,2541	59,45	-7,04	7,74	18,38	30,49						-9,65	
<b>Std Error</b>		4,60	5,89	5,78	5,66	4,96						3,90	
<b>p stat</b>		0,000	0,234	0,182	0,001	0,000						0,014	
<b>Regression 9</b>	0,2641	19,89	-4,38	2,86	12,75	25,83							0,60
<b>Std Error</b>		12,12	5,90	6,09	6,20	5,23							0,21
<b>p stat</b>		0,103	0,459	0,639	0,041	0,000							0,005
<b>Regression 10</b>	0,2849	22,43	-5,75	3,44	14,56	31,43	0,20	2,69	-0,32	5,44	-2,76	-5,00	0,49
<b>Std Error</b>		16,76	6,23	6,26	6,53	6,73	0,38	4,50	4,69	6,94	3,00	4,34	0,22
<b>p stat</b>		0,183	0,358	0,583	0,027	0,000	0,608	0,551	0,946	0,434	0,359	0,251	0,031

#### d. Classroom Behaviour

Analysis of classroom behaviour is discussed in Chapter 6. In Regression 1 (table 8.4), the influence of FAS on classroom behaviour without controlling for other variables is examined. It shows that FAS reduces expected classroom behaviour scores by 4.2 percentage points, significant at a 10% level.

Since maturity and discipline by the teacher are influential, behaviour will differ by grade. The effect of different grades (regression 2) is statistically significant at a 1% level, but the improvement in behaviour is not uniform. Grade 1 learners display the lowest behavioural score, followed by Grade 4 learners (8.5 percentage points more), then Grade 2 learners (9.1 percentage points more). Grade 3 learners display the highest classroom behaviour score at 13.7 percentage points more than Grade 1's. This suggests that factors other than age influence behaviour.

Once again the number of days a learner is absent from school (regression 3), whether they live on a farm or in town (regression 4), whether they board or live at home (regression 5), whether Afrikaans is their home language (regression 6) and how many years they are too old for their grade (regression 7) do not have statistically significant impacts. Girls behave better than boys, receiving on average 6.2 percentage higher behaviour score, significant at a 1% level. For every percentage point increase in reading score (regression 9) classroom behaviour scores increase by 0.09 percentage points, significant at a 1% level.

Regression 10 contains all explanatory variables, and shows that grade, sex and reading score are statistically significant. FAS is significant at a 20% level. These variables are retained to produce regression 11, where FAS is almost significant at the 10% level.

Table 8.4: Regressions of Effects on Classroom Behaviour

Regressions of Effects on Classroom Behaviour													
	R2	Costant	FAS	Grade 2	Grade 3	Grade 4	Days Absent	Farm	Boarding	Afrikaans HL	Years too Old	Sex	Reading
<b>Regression 1</b>	0,0186	63,21	-4,21										
<b>Std Error</b>		2,40	-1,76										
<b>p stat</b>		0,019	0,081										
<b>Regression 2</b>	0,2228	55,73	-3,68	9,11	13,17	8,51							
<b>Std Error</b>		1,45	2,17	2,10	2,15	1,90							
<b>p stat</b>		0,000	0,092	0,000	0,000	0,000							
<b>Regression 3</b>	0,2288	55,12	-3,75	9,40	13,51	9,07	-0,08						
<b>Std Error</b>		1,76	2,16	2,09	2,20	2,09	0,13						
<b>p stat</b>		0,000	0,084	0,000	0,000	0,000	0,532						
<b>Regression 4</b>	0,2322	56,87	-3,44	9,09	13,12	8,21		-1,58					
<b>Std Error</b>		1,80	2,18	2,10	2,13	1,91		1,51					
<b>p stat</b>		0,000	0,115	0,000	0,000	0,000		0,298					
<b>Regression 5</b>	0,2285	55,22	-4,05	9,47	13,16	8,39			0,88				
<b>Std Error</b>		1,72	2,21	2,10	2,14	1,90			1,57				
<b>p stat</b>		0,000	0,069	0,000	0,000	0,000			0,575				
<b>Regression 6</b>	0,2270	55,44	-3,80	9,32	13,18	8,52				0,35			
<b>Std Error</b>		2,69	2,17	2,10	2,14	1,89				2,54			
<b>p stat</b>		0,000	0,082	0,000	0,000	0,000				0,891			
<b>Regression 7</b>	0,2368	56,54	-3,56	9,44	13,45	10,03					-1,50		
<b>Std Error</b>		1,55	2,16	2,08	2,14	2,17					1,05		
<b>p stat</b>		0,000	0,101	0,000	0,000	0,000					0,154		
<b>Regression 8</b>	0,3162	59,81	-4,07	8,65	11,79	8,30						-6,26	
<b>Std Error</b>		1,63	2,03	1,97	2,03	1,78						1,37	
<b>p stat</b>		0,000	0,047	0,000	0,000	0,000						0,000	
<b>Regression 9</b>	0,2696	51,03	-3,09	9,39	11,49	5,93							0,09
<b>Std Error</b>		2,15	2,24	2,20	2,21	2,10							0,03
<b>p stat</b>		0,000	0,170	0,000	0,000	0,005							0,005
<b>Regression 10</b>	0,3556	57,52	-3,52	8,91	10,39	5,56	0,00	-2,48	2,09	-0,86	-0,12	-5,93	0,06
<b>Std Error</b>		3,85	2,26	2,16	2,25	2,58	0,14	1,63	1,70	2,53	1,10	1,51	0,03
<b>p stat</b>		0,000	0,121	0,000	0,000	0,033	0,996	0,130	0,219	0,735	0,913	0,000	0,031
<b>Regression 11</b>	0,3405	56,11	-3,53	8,89	10,60	6,37						-5,79	0,06
<b>Std Error</b>		2,41	2,14	2,10	2,12	2,00						1,44	0,03
<b>p stat</b>		0,000	0,101	0,000	0,000	0,002						0,000	0,032

### e. Interactions between Grade and FAS

Tables 8.5 to 8.8 below show regressions of the effects of FAS and grade, as well as their interaction terms. This was done to ascertain whether the effect of FAS on educational outcomes changes according to what grade learners are in. In table 8.5 the impact on home language mark is considered. Although the impact of FAS seems to display a turning point in Grade 2, this is not statistically significant. The impact on mathematics mark (table 8.6) shows individual grades as significant, but not the interacted terms. Only Grade 3 and 4 have statistically significant impacts on reading score (table 8.7), but the interaction terms do not. Table 8.8, shows the interactions on classroom behaviour, where every grade is statistically significant, although FAS is not. Interestingly a Grade 4 learner with FAS is predicted to display classroom behaviour 9.5 percentage points lower than a Grade 1 learner who does not have FAS; the result is almost statistically significant at a 10% level.

*Table 8.5: Regression of Effect on Home Language Mark with Interaction*

Regression of Effects on Home Language with Interactions									
	R2	Constant	FAS	Grade 2	Grade 3	Grade 4	Grade 2 * FAS	Grade 3 * FAS	Grade 4 * FAS
<b>Regression 1</b>	0,0460	54,00	-10,33	0,50	-4,37	-3,31	7,12	3,70	-1,96
<b>Std Error</b>		2,74	7,25	4,06	4,06	3,61	10,01	12,31	10,59
<b>p stat</b>		0,000	0,156	0,902	0,284	0,361	0,764	0,764	0,853

*Table 8.6: Regression of Effect on Mathematics Mark with Interaction*

Regression of Effects on Mathematics with Interactions									
	R2	Constant	FAS	Grade 2	Grade 3	Grade 4	Grade 2 * FAS	Grade 3 * FAS	Grade 4 * FAS
<b>Regression 2</b>	0,2128	59,36	-7,19	-7,89	-15,19	-22,10	2,01	2,03	4,13
<b>Std Error</b>		2,56	6,76	3,79	3,79	3,37	9,34	11,49	9,88
<b>p stat</b>		0,000	0,289	0,039	0,000	0,000	0,830	0,860	0,677

*Table 8.7: Regression of Effect on Reading Score with Interaction*

Regression of Effects on Reading Score with Interactions									
	R2	Constant	FAS	Grade 2	Grade 3	Grade 4	Grade 2 * FAS	Grade 3 * FAS	Grade 4 * FAS
<b>Regression 3</b>	0,2327	54,08	-15,15	5,71	20,21	29,83	19,35	1,97	9,50
<b>Std Error</b>		4,07	11,64	6,43	6,03	5,35	16,11	18,81	16,33
<b>p stat</b>		0	0,195	0,375	0,001	0	0,231	0,917	0,562

*Table 8.8: Regression of Effect on Classroom Behaviour with Interaction*

Regression of Effects on Classroom Behaviour with Interaction									
	R2	Constant	FAS	Grade 2	Grade 3	Grade 4	Grade 2 * FAS	Grade 3 * FAS	Grade 4 * FAS
<b>Regression 4</b>	0,2405	55,20	0,07	9,61	13,81	9,58	-2,34	-4,80	-9,48
<b>Standard Error</b>		1,53	4,04	2,28	2,26	2,01	5,58	6,86	5,90
<b>p stat</b>		0,000	0,986	0,000	0,000	0,000	0,676	0,485	0,109

The limited data available for this study means that such interacted analysis are stretching it to its limit, possibly explaining the lack of significance. Further investigation into these interacted effects could be conducted with an extended dataset in future.

## f. Summary of Findings

Comprehensive regressions analysing the effects of numerous factors on educational outputs were run. Table 8.9 summarises these effects.

*Table 8.9: Summary of Regression Outputs*

	Home Language	Mathematics	Reading Score	Classroom Behaviour
<b>FAS</b>	Generally statistically significant at 10% level	Not statistically significant	Not statistically significant	Statistically significant at a 10% or 20% level
<b>Grade 2</b>	Not statistically significant	Generally statistically significant at 5% or more	Not statistically significant	Always statistically significant at 1% level
<b>Grade 3</b>	Only statistically significant when reading or classroom behaviour are included	Always statistically significant at 1% level	Always statistically significant at 5% level or more	Always statistically significant at 1% level
<b>Grade 4</b>	Only statistically significant when reading or classroom behaviour are included	Always statistically significant at 1% level	Always statistically significant at 1% level	Always statistically significant at 1% level
<b>Number of Days Absent</b>	Not statistically significant	Not statistically significant	Not statistically significant	Not statistically significant
<b>Farm</b>	Not statistically significant	Not statistically significant	Not statistically significant	Not statistically significant
<b>Boarding</b>	Not statistically significant	Always statistically significant at 1% level	Not statistically significant	Not statistically significant
<b>Afrikaans Home Language</b>	Not statistically significant	Not statistically significant	Not statistically significant	Not statistically significant
<b>Number of Years Too Old</b>	Always statistically significant at 5% level or more	Statistically significant on own, but not when other factors are included	Not statistically significant	Not statistically significant
<b>Sex</b>	Always statistically significant at 10% level or more, Girls receive higher marks.	Not statistically significant	Statistically significant on own, Girls receive higher scores, but not when other factors are included	Always statistically significant at 1% level, Girls behave better than boys
<b>Reading Score</b>	Always statistically significant at 1% level	Always statistically significant at 1% level		Always statistically significant at 5% level or more
<b>Classroom Behaviour</b>	Always statistically significant at 1% level	Always statistically significant at 1% level	Always statistically significant at 5% level	

FAS was diagnosed in 12.4% of this sample, which represents 21 of 170 children, the majority of whom are in Grade 1. This study aims to quantify the impact of FAS on a child within the classroom. Although influences may not always be statistically significant, this may be largely due to the limited sample available and should not deter further research into this area. FAS was found to have a generally statistically significant impact on home language marks, but not on mathematics scores. This could be attributed to the fact that all learners struggle with mathematics. The lack of a significant impact of FAS on reading may be because of the unreliability of reading scores. FAS does have a significant effect on classroom behaviour, though sometimes only at a 20% level, which will have a cumulative effect in a classroom with many FAS learners. Although the magnitude of the influence is less than expected, its effect is probably mitigated by the extended support that the school provides to these children (see Chapter 4). Without these efforts the gap would probably be larger.

Grade did not have a statistically significant influence on home language marks, indicating that learner's language ability increases at the same pace as the difficulty of the work examined. Similarly, the reading ability of learners increases as they progress throughout school. An exception is Grade 2 because the school is encouraged to progress learners to Grade 2 even if they cannot read. On the other hand, as a learner progresses through the grades their mathematics mark tends to

decrease substantially to the point where a Grade 4 learner is expected to achieve up to 30.8 percentage points less than a Grade 1 learner. Since mathematics is not an intuitive subject this suggests that increasing complexities are not understood.

Although classroom behaviour changes significantly by grade, this is not uniform. Behavioural score are lowest in Grade 1, highest in Grade 3, then in Grade 2, then in Grade 4. This indicates that behaviour is influenced by more than just maturity.

The number of days a learner was absent does not have a statistically significant impact on any of the educational outcomes, nor does it have a high correlation with FAS. Therefore, a learner with FAS is not more likely to be absent from school and a learner who is absent from school does not necessarily perform worse in class. This may be as a result of the small sample where specific data points may skew the results. For example, the regression results are substantially influenced by a strong learner in Grade 4 who was absent for an extended period of time for Tuberculosis treatment.

Equally, the impact of living on a farm compared to in town does not have a significant impact on any educational outcome. The town does not provide any favourable inputs to a learner such as accessibility of resources. Bushmans Kloof, which is classified as a farm, does, however, provide educational resources to the children living there. The positive influence of this resort may dampen the effect of being isolated on a farm. Similarly, the lack of influence of Afrikaans as home language may indicate that being taught in one's mother tongue is not relevant, or that second language learners receive additional support. Since most of the learners who speak other languages live on Bushmans Kloof, the resources available there may be offering this support.

Boarding offers a place of safety from difficult home circumstances (Chapter 4). The significant influence of boarding on mathematics mark may therefore rather reflect the influence of these circumstances. In this light, the fact that boarding does not have a negative impact on home language marks, reading and behaviour should be taken as credit to the work the school is doing, as one would expect a child who comes from adverse home situation to misbehave in class.

Less than a third of learners in the sample are the right age for the grade, the majority being one year too old (51.8%). Marks tend to decrease for every year a learner is too old, but this is likely due to another factor (such as ability) that causes learners to repeat as well as receive low marks.

Although the sample is almost evenly split between boys and girls, sex is almost always significant in explaining school outcomes. Girls perform significantly better in

home language, reading, and behaviour. However, boys perform better in mathematics in our sample.

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## Chapter 9: Challenges, Limitations and Scope for Further Research

This aims to add to the field of research already conducted to understand the impact of Fetal Alcohol Syndrome (FAS) on individuals and society. Limitations due to sample size and methods used must be seen in conjunction with the opportunities for future research stemming from this work.

### a. Challenges and Limitations

#### i. Sample Size

There are various limitations to a study of this nature. Such a comprehensive study of all the pupils within a classroom is time-consuming, placing limitations on the sample size. The sample consisted of 170 learners, 21 of who were subsequently diagnosed with FAS. Although valuable insights were obtained, the sample is limited, thus this project must be viewed in conjunction with the literature. Emphasis was placed on an in-depth understanding of the manifestation of FAS within the classroom, which can be built on in the future.

#### ii. Risk of Misdiagnosis

Since diagnosis of the children with FAS is critical, the implication of misdiagnosis must be considered. This misdiagnosis can take two forms: the omission of a learner with FAS from the diagnosed group and the inclusion of a learner with PFAS (a less severe birth defect resulting from pre-natal alcohol exposure) in the diagnosed group. An experienced doctor conducted the diagnosis but he could not confirm maternal drinking, as ethical clearance was not obtained for this. Parents may also behave differently when observed if they feel judged. Since developmental difficulties are still be present for individuals with FAS the actual effect of FAS may be underestimated. It is likely that many children will have some form of prenatal alcohol exposure. Future studies could benefit from work by a team of experts.

#### iii. Measurement of Class Marks

The class teacher determined home language and mathematics marks, therefore the standard cannot be guaranteed. If the test is too difficult all the children will underperform, making comparisons futile. Similarly, if the tests are too easy all the children will perform well. Therefore, the difficulty should be set at the margin where those children with FAS would reveal their difficulties in comparison to their peers. Since the teacher is an expert and engages with the learners' daily, they will be able to gage this level more accurately than an external examiner. It is still important that the analysis is not solely based on a single test, but rather on an average performance over a number of tests and subjects. Two school subjects and two external measures were considered in this study. However, other outcomes, such as physical ability, though difficult to measure, could add new insights.

#### **iv. Measurement of Reading Ability**

The reading score measure is not comparable across grades, as each teacher provided the words to be tested. Since progression of difficulty was not determined and Grade 1 learners were tested on sentences rather than sight words, one must caution against strong conclusions drawn from this measure. It must rather be viewed as supporting evidence for other trends. Future studies should consider a comparative measure of reading ability such as the ESSi reading and spelling test in Afrikaans, though a registered psychologist or support teacher must conduct this.

#### **v. Measuring Behaviour**

Use of coding schemes to quantify classroom behaviour is not without its challenges. Merrell (1999, p.6) describes the threats to the validity of behavioural observations, including: Poorly defined behaviour categories; low interobserver reliability; observer reactivity (i.e. measuring behaviour to fit a preconceived idea); situational specificity of target behaviours; inappropriate code selection; and observer bias. Poorly defined behavioural categories will not pose a problem as long as application of the categories is consistent. Since a single researcher conducted all the observations interobserver reliability was controlled for. Observer reliability was minimised since all observations are subject to a single, consistent influence in this regard. Measurement observer bias was reduced since diagnosis of learners was only known once observations had been completed. In field experiments subjects often change their behaviour if they know they are being observed, in this case children may behave well because the researcher is in the classroom. Reading tests were conducted first, allowing me to be identified as a teacher before observations commenced, reducing this effect. Behaviour was assessed twice, and generally with different teachers, reducing but not eliminating the teacher effect. The teacher effect was removed by controlling for grade in regressions. Further observations with a wider variety of teachers should be done. The code selected was due to ease of use and time constraints. As long as a constant code is used in comparative studies the data will remain consistent.

#### **vi. School Involvement**

The fact that I was viewed as a teacher, though vital for the reliability of the research, also posed challenges. This led to involvement in all aspects of the school (such as athletics days and fund raisers on weekends), which is very time consuming. Repeatedly taken over the teacher's role when they were unavailable, interrupted observations. I was also asked to teach English for a considerable amount of time, which hindered research progress. Afrikaans is the main language spoken in the region, and thus the language of this research. Had I not been a home language Afrikaans speaker this would have been a considerable challenge, even so, the slang spoken and local accents required careful study.

Participating in the lives of the school and its learners granted insight into the true impact of FAS on these children. This enriched the research. The emotional impact of conducting such an in depth study is discussed in an appendix but connects to the fact that FAS irrefutably alters the lives of children, and the emotional impact of this cannot be ignored.

#### **b. Scope for Future Research**

Many questions about FAS still remain unanswered, opening the field for wider research. A Grade 10 Bishops boy asked when visiting EFPS on an outreach programme: *“So what are we doing about it?”*

The first step to fixing any problem is understanding it. FAS has a devastating effect on lives which can never be removed, although it is completely preventable. There are therefore two areas of focus that are useful for sufferers: helping those individuals with FAS to live the best life possible; and preventing the perpetuation of the cycle by future generations. This study attempts to quantify how central nervous system (CNS) defects in learners with FAS are troubling in the classroom. In order to draw more definitive conclusions, the dataset must be expanded.

Reading score should be re-evaluated because reading ability has a lasting impact on the ability of a child to learn. Evaluating the ESSI reading and spelling test in Afrikaans would provide valuable insight. Other educational outcomes such as physical ability, creativity and social skills should also be considered, the aim being to gain a comprehensive picture of a learner’s ability. The diagnosis and evaluation process would also benefit from a team of experts, such as child psychologists and physical therapists.

This school only represents a small sample. Expansion of the study to more schools would provide a clearer picture of FAS in this community. Schools with which EFPS shares a geographic catchment area could be included, such as Wuppertal Primary, Cederberg Primary, Ausberg Landbou Gymnasium, and Dwarsrivier. This would remove the school-specific effect and increase the sample size considerably. This would allow evaluation of interactions between grade and FAS, which stretched the current dataset beyond its capabilities. Such an analysis would establish whether the impact of FAS changes by grade i.e. do the abilities of learners with FAS continue to diverge from those of their classmates, always stay a predetermined amount behind, or catch up? A study of Wuppertal would also show the impact of geographic and institutional isolation, especially since no alcohol is sold in the town. The same instruments must be used, specifically the BOSS measure of classroom behaviour (Chapter 6). This is a time consuming process, but provides valuable insight into the classroom environment. Because of time constraints, some classroom observation was done with a video recorder and analysed after the fact. This was a helpful adaptation that should be implemented from the outset.

FAS is a lifelong disorder, the long-term educational impact of which is not fully understood. Part of the challenge is that learners with FAS leave school. Thus, simply extending the sample to include older learners will not give an accurate assessment of the influence of FAS. A longitudinal study, tracking individuals at intervals in their lives would be of great value. Since this is a small, and relatively closed community, most children will presumably live in the same area in 5 years. Finding them after the lapse of time and evaluating their progress would provide information as to the trajectory of FAS to determine if FAS children catch up or fall further behind.

Even with the limited sample examined in this study, the impact of FAS on this community and the need for intervention is undeniable. There are some small, specialised schools in South Africa and globally that aim to help individuals with FAS to learn effectively (such as the Arizona project). Careful observation of the methods found to work in these schools could provide strategies for intervention. However, in South Africa, learners with FAS are more likely to find themselves in a small, public, rural school such as EFPS, which does not have the resources (especially in terms of staff) to implement many of the strategies suggested. The adaptation of interventions to the realities of these classrooms is required.

Further research in this area falls should be interdisciplinary. Further economic and econometric analysis requires a more comprehensive dataset, but would quantify the effects of FAS. Such a data set should include a wider sample of learners, from different schools and socio-economic backgrounds. A team of experts should do the diagnosis of FAS from different fields. Non-verbal performance (as tested through the Raven progressive matrices) and working memory tests (such as Digit span (WISC)) and the ESSI reading and spelling test in Afrikaans should also be included to account for difference in testing standards between schools. This analysis could also be extended to a measurement of the ultimate cost of FAS for the economy. However, a study of the impact of this syndrome needs to attempt to quantify its personal and societal challenges. Educational research is required to adapt the learning environment so that a child with FAS is supported. Psychologists and social workers need to work to improve the home environments of learners with FAS. Sociological studies scrutinising why FAS is still prevalent should be combined with public health efforts to minimise future cases. Collaborative work, shared experiences and interdisciplinary research are vital in this regard.

## Chapter 10: Conclusion

Fetal Alcohol Syndrome (FAS) describes a birth defect that results from a mother drinking alcohol excessively during pregnancy. The syndrome has been widely researched internationally and within South Africa, with an estimated prevalence rate in the developed world of 0.97 per 1000 live births (May et al, 2004). This study finds a rate of 124 per 1000 (that may include incidences of PFAS because of the method of diagnosis), which is in keeping with other South African research (see table 10.1). Learners in Grade 1 to 4 at Elizabethfontein Primary School (EFPS), a small farm school near Clanwilliam, which is a non-viticulture farming community in the Western Cape, were examined. Unlike previous studies on FAS prevalence, the focus of this study is the classroom environment, context and educational outcomes of learners with FAS.

*Table 10.1: FAS Prevalence Rates from Studies in South Africa*

Area	Year Published	Viticulture	Sample	FAS Cases (Excluding PFAS)
Cape Town, Western Cape <sup>1</sup>	1985	N	Mothers	3.56 per 1000
Wellington, Western Cape <sup>2</sup>	2000	Y	Grade 1	42.9 per 1000
Wellington, Western Cape <sup>3</sup>	2005	Y	Grade 1	73 per 1000
Wellington, Western Cape <sup>4</sup>	2007	Y	Grade 1	89.2 per 1000
Upington, Northern Cape <sup>5</sup>	2008	Y	Grade 1	97 per 1000
De Aar, Northern Cape <sup>6</sup>	2008	N	Grade 1	64 per 1000
Wellington, Western Cape <sup>7</sup>	2013	Y	Grade 1	59.3 to 91 per 1000
Aurora, Western Cape <sup>8</sup>	2013	N	Grades 1-7	100 per 1000
Clanwilliam, Western Cape <sup>9</sup>	n/a	N	Grades 1-4	124 per 1000

The poor school performance of learners with FAS is a result of multiple interactions. EFPS has a large catchment area, with few tarred roads and no public transport. Lack of cell phone reception and other resources isolates the inhabitants and restricts the support offered to these vulnerable children. The curse of history of the region, particularly racial segregation, has played a big role in the educational trajectory of

<sup>1</sup> Croxford & Viljoen (1999)

<sup>2</sup> May et al (2000)

<sup>3</sup> Adnams et al 2005

<sup>4</sup> May et al (2007)

<sup>5</sup> Urban et al (2008)

<sup>6</sup> Urban et al (2008)

<sup>7</sup> May et al (2013)

<sup>8</sup> Olivier et al (2013)

<sup>9</sup> Current Study (2015)

children. The legacy of the Dop system can still be seen, as alcohol is a cornerstone of social interaction and has always played a big part in these children's lives. Wages are paid weekly, which gives rise to binge drinking and child neglect over weekends. The cycle of alcohol dependency has resulted in unsupervised children partaking in a range of risky behaviours. The school offers protection, routine and structure and as such often fulfils the role of a "safe haven".

Elizabethfontein Primary School (EFPS) is a small, quintile 1 school, situated on a farm 35km out of Clanwilliam. Two-thirds of the 262 learners board during the week. The school values of love, respect, kindness, friendship and honesty are emphasised in an effort to provide a well-rounded education, which includes extracurricular activities such as Riel Dancing. Meals are provided daily, thanks to the school feeding scheme, the vegetable garden and donations. For this research I spent six months at EFPS, interacting with learners, teachers and the community on a daily basis.

The school faces many challenges, especially financial. It is a no-fee school that relies heavily on donations and fundraising to cover maintenance and staffing costs (56% of the staff are not paid for by the education department). The Governing Body makes an effort to build and to initiate fundraisers (especially through Riel Dancing). These have provided the school with more resources than other Quintile 1 schools. The emphasis on academic development of staff members paid by the education department and the focus on fundraising by those paid by the Governing Body causes friction. Teachers are enthusiastic and care for the children more than at most schools. However, help and support, especially with FAS learners, is needed, as many of the teachers are at their wits' end. The school has not given up on these children, even if society has.

Transportation of learners in such a large catchment, area with limited resources and government support is also challenging, as is the disruption this causes to learning on Mondays and Fridays. Few learners are the correct age for their grade, having repeated and then progressed without attaining the necessary skills. This, in combination with often dysfunctional home environments, results in older learners who challenge the discipline structure. The school has a high dropout rate.

A local doctor diagnosed 21 of the 170 learners with FAS (12.4% or 124 per 1000), which is the highest prevalence found in South Africa to date and poses unique challenges. Data on class marks, reading ability, classroom behaviour and other factors teachers suggested as contributors to performance were analysed. FAS generally has a significantly negative effect on home language marks and classroom behaviour.

The findings of this study are broadly in line with those of other studies which have investigated the impact of FAS on classroom behaviour. Learners with FAS have been found to have lower IQs and mental capabilities than their classmates. They are concrete thinkers who cannot generalise and therefore struggle to follow rules and principles. Memory deficits, especially verbal and visuospatial deficits, require specialised and time-consuming teaching techniques. Children with FAS are hyperactive, distractible, and inattentive and impose a negative externality within the classroom. Learners with FAS also display deficits in social interactions, which sometimes result in misbehaviour and violence (Howard & Beckwith, 1997, p.399). Schools specialising in the education of learners with FAS may provide valuable tools to minimise these challenges, but these must be translated into appropriate strategies for the main-stream, under-resourced schools these children may have to attend.

This study has shown that FAS has an undeniable impact on learners, the school and the community they live in. The key to breaking the cycle of alcohol abuse causing FAS is education, which starts with understanding the specific manifestations and developing strategies to help and support learners in reaching their full potential. This requires interdisciplinary research and collaboration, as it is a multifaceted and complicated problem.

In response to this research EFPS has dedicated 2016 to "*The Year of Alcohol Awareness*". Workshops and information sessions will be held at the school and on surrounding farms. Community support is needed to prevent the further cases FAS and support the development of all vulnerable children. FAS mitigation should be prioritised in areas where it is prevalent. This will require a concrete plan of action resulting from collaboration between parents, learners, the government, NGO's and academia. Places of safety for children from highly abusive and dysfunctional families should be established in these areas.

EFPS's core values of *Love, Respect, Kindness, Friendship and Honesty* should govern all work in this area. Ultimately the subjects of this research are children who did not ask for their place in life and deserve the best we can do.

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## Appendix: Personal Reflection

The idea of researching FAS stemmed from an interaction I had whilst doing a teaching practical as part of my Postgraduate Certificate in Education. A Grade 11 boy who was unable to sit still, always interrupted my lessons and required constant attention. This was very frustrating, but when I spoke to the class teacher she informed me that he had FAS and the school was very proud of the fact that he had made it so far in the mainstream. After researching the manifestations of FAS I recognised the features in many homeless people in Stellenbosch. This prompted the question of what kind of future a child with FAS can expect. This question accompanied me into my first meeting with Professor Corné van Walbeek, who became my thesis supervisor. Together we established that the first place FAS differentiates an individual is when they enter school. If I would to understand this complicated issue I would need to get my hands dirty and go see for myself.

In 2015 I moved to Clanwilliam, a small town at the tip of the Cederburg Mountains. I volunteered at Elizabethfontein Primary School (EFPS), a small farm school nestled 35km away from town, over the picturesque Pakhuis Pass. EFPS welcomed me with open arms, helped me to find accommodation in town and their bus picked me up at the crack of dawn for the daily school commute. The school year for teachers started before the learners arrived. What struck me from the start was the focus on every learner, their home environment and how best to support them. For example, the teachers discussed which learners should be removed from home and placed in the boarding house because of suspected child abuse or neglect. On the first morning when pupils would attend school a fellow teacher warned me that the learners would *“demand more love than I would be able to give”*. That afternoon a Grade 1 learner fell asleep leaning against me in the bus after her first day of “big school”, and I realised that my heart was already touched.

My ability to speak Afrikaans fluently allowed access to this Quintile 1 School, without which this research would never have been possible. From the start of the school year I was placed in the Grade 3 classroom with a very experienced teacher. I helped those learners who were struggling with their work, particularly Chris\*. At the time I did not know, but he was later diagnosed with FAS. He relished in the attention and care, and was so proud of small achievements that would have been overlooked before. When he learned that he shared a birthday with my mother he was overjoyed. Throughout my time there, he made a point of reminding me about this bond, even though he could not remember the date.

The neglect and abuse of children was shocking, but what was more disturbing is how desensitised some teachers had become. Incidences of rape, incest and physical abuse were discussed, but the human aspect was often omitted as it became overwhelming. Child protective services in Clanwilliam are severely stretched.

Alex's\* story touched me deeply. He was a Grade 3 learner who was absent from school often. I promised him a chocolate every Monday he came to school, but one Monday he did not return and I have never seen him since. The idea that children disappear and nothing can be done about it is frustrating and heart breaking.

I experienced the challenges faced by teachers first-hand whilst teaching English to Grade 3's and Grade 4's. Apart from the lack of discipline and the added challenge of having learners with FAS in the classroom, the English ability of learners was especially poor. To them it was very foreign, as learners have not been exposed to English media or individuals. During one lesson I asked them what other country in the world speaks Afrikaans, and they answered Citrusdal (the neighbouring town). This shows how small their world is and the need for teachers to help broaden horizons. Some learners had never seen a traffic light before as the closest one is over an hour's drive away. I told stories of places I have visited, and tried to point these out on a map, but many learners could not grasp this world beyond where they had grown up. Even small luxuries like having an ice cream on a hot day were foreign concepts. This makes programs where learners are taken further than their comfort zone vital.

Challenges are exacerbated by a lack of resources, but it was encouraging to see how much can be done with what little is provided. The children were full of life and hungry for knowledge. An enormous amount of effort goes into fundraising (sometimes to the detriment of academics) to ensure that children do not go without. Since EFPS is built on private property, the education department does not finance maintenance and expansions. The land was donated by a previous generation of farmer, and the current owner does not see the school as a priority. Renovations to the Grade 1 classroom were started but never completed because the contractor ran out of funds. It is sad that already vulnerable children are the ones to suffer.

Having grown up in an Afrikaans household I did not expect to experience such great cultural differences. Understanding learners was challenging at first because of the specific slang. Because of my skin colour many children expected me to distance myself. A Grade R girl pointed out that I am a different colour to her in the school bus one day. In response I turned her hand over pointed out that our palms are the same colour and said: *"but we are the same on the inside"*.

Living in the town of Clanwilliam gave me unique insight into the mind-sets that surround these children every day. Most people showed me great generosity. A lady took it upon herself to make a cover for my car whilst it stood in the sun, and my landlady often admired my work over dinner. There were more young people in town than I expected, many of who became friends and were interested in my research. One of the local doctors offered his help with my research, and went beyond the call of duty in diagnosing those children with FAS. A farmer from a

neighbouring area invited me to visit and speak to his workers about FAS at a soup-and-bread evening he had specifically organised. The coloured community, especially farm workers, were honoured that I took time to look out for their children, whom they often feel are forgotten by the system. Even with the little they have, they gave me a bag of potatoes to say thank you. I was also invited to the 10<sup>th</sup> birthday party of a girl at the school. The whole family was so excited when I joined in to the celebrations that they named me “the pale cousin”.

On the other hand, some white residents could not understand the reason for the research. They accused me of being too liberal and held the fact that I can fluently speak English against me. A talk on FAS at a Vroue Landbou-Vereeniging (an organisation for the women in the agricultural community) meeting was met with a hostile reception. Many of the women became defensive as they thought I was blaming the white farmers for FAS. Upon hearing about my research a man in town said I was stupid for trying to help these children; we should just let the “*hotnots* (derogatory term for coloured people) *die out*”. The history of the town, segregation and the legacy of Apartheid influences the lives of children today, as do the attitudes and prejudices that still persist.

Before embarking on this study I did not realise how my personal history is intertwined in the history of these children. Whilst researching the origin of Clanwilliam I discovered that one of my direct ancestors was one of the first farmers in the Agterpakhuis region. This brought the experiences very close to home. I visited my extended family that still live in the original farmhouse near Wuppertal and gained new insight into the legacy passed on to me.

The legacy of the Dop system can still be felt today. Alcohol plays a big role in the community since there is little else to do in town. The practice of binge drinking on weekends was made clear when I visited Michaela’s\* (an old EFPS learner who managed to escape her circumstances and is now studying through UNISA) father. At 4pm on a Saturday he was so drunk he was crawling around on all fours in the garden. I am inspired by her story and her ability to break out of the cycle into which she was born. Many children are not as lucky.

Spending time with each individual learner at EFPS (in collecting reading marks) meant that they all got to know me and I formed a close bond with many. A group of learners met me at the bus every morning to carry my bags, and I could not walk around school without being greeted, hugged and smiled at. In the afternoons we often sat outside singing and clapping together, which gathered a big crowd. These are children like any other, who just want to be loved and feel valued. Saying goodbye at the end of my time at EFPS was very hard. The learners had moved me very deeply and I walked away on the last day crying.

I returned to EFPS at the end of November 2015 for two weeks with an outreach group from Diocesan College (Bishops) in Rondebosch. The children had prepared a concert for us, and cheered the visitors on as they walked through the school gates. When the learners saw me I was swept up in an embrace that nearly knocked me over. It was a privilege to end the school year at EFPS, and share what I had learnt with the Bishops boys. I realised that the question of "*How does FAS influence a child's classroom performance?*" gives rise to the follow up question of "*How can we improve a learner with FAS's classroom performance?*" which I hope to explore next.

Often case studies are reduced to numbers and figures, but when I look at the data I see the faces of children who did not ask for this life. I realise that it wasn't that they demanded more love than I was able to give, but that they gave more love than I had ever expected.