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School of Mathematical and Natural Sciences

Master's research

Topic: Determination of factors contributing towards women's unemployment in the Capricorn and Sekhukhune districts in the Limpopo Province

By

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Abstract

The study aimed to investigate the factors contributing towards the unemployment of women in the Sekhukhune and Capricorn districts in the Limpopo Province. Limpopo has the highest proportion of rural dwellers in South Africa, hence it is expected that economic conditions in the province are inferior to the national average; with the consequence of high unemployment rate. Sekhukhune is rural while Capricorn is urban, so the study is considered as a comparison of rural-urban structures. Specifically, the study focused on women aged between 20-54 years. Using proportional allocation, about 2 600 women from Capricorn district and 2 000 women from Sekhukhune district were interviewed.

Primary data was used and direct interviews were conducted. Multivariate statistical analyses, including hierarchical loglinear, generalised linear models and multiple logistic regressions, were used to determine the relationship between dependent and independent variables. The factors that were most predictive are: district, age, education level, and marital status. The least predictive factors were family background and the number of children a woman has.

Key findings of this research could shed light on how to deal with the factors that contribute to women unemployment, how to achieve equal employment opportunities and also remove the obstacles and barriers to women's participation in the workplace.

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Declaration

I, Maboko Tumisho, hereby declare that the work contained in this project report for the award of the Masters degree in Statistics at the University of Venda is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Signature..... Date 15/8/16

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Dr. K.A. Kyei

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

South African women under the legal control of their fathers and husbands were second class citizens for many years until the introduction of the Bill of Rights written in 1993 that enabled all women, in this country, to receive formal recognition as equal citizens. Black women were disadvantaged as a result of their race and their gender and the law in various forms, has had a significant role in this prejudice. Customary law, for instance, gives black women the status of minors and excludes them from rights regarding children and property. South Africa's common law in addition deprived white women of guardianship and various economic rights (South African History online, (SAHO), 1900-1994).

Even now women and black women in particular, are still economically disadvantaged. They make up a disproportionate section of the unemployed and tend to occupy more of the lower-paid jobs, as domestic and farm labourers. They often earn less than men even for the same tasks (SAHO, 1900-1994). Unemployment has always been a matter of serious concern in South Africa from the 1970s (Kingdon & Knight, 2000).

It is clear that a major obstacle to equal employment opportunity is the capacity for women and men to manage their work, life and family responsibilities. Long and inflexible working hours may preclude many workers with family responsibilities from pursuing particular career paths or job opportunities. Men are less likely to access flexible work opportunities and women continue to engage less in paid work. It is necessary for the wellbeing of the economy and community, that both women and men are able to enjoy the different benefits that combine both caring and paid work.

This study focuses on women's unemployment status, looking at the level of unemployment of women and makes an attempt to find the causes of such unemployment. Women's unemployment is a big problem for the society because women are the bread winners. Most women are bound to look after

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their children, including such reasons as polygamy, therefore, when they are unemployed and without money, the family may face crises.

"Women experience far higher unemployment that is, they experience a far lower participation rate [in the economy]", Lehohla said in Pretoria last month (April 2015) at the release of the Gender Statistics in South African 2011 report. According to Lehohla, at least 32.4% of the population was living below the food poverty line, set at three hundred and five rand (R305) per individual per month; and most were women. The report showed that the unemployment rate of women was 29% higher than the national average, which was pegged at 24.9%. The percentage of those employed was highest among white men and lowest among black women. The figures indicated that 72.6% of white men were employed; 56.1% of white women, 42.8% of black men and 30.8% of black women. Lehohla (2015) noted that blacks and coloureds were least likely to attain a tertiary qualification and that fact accounted for the high unemployment rate. Black women were more likely to have a tertiary qualification in comparison to their male counterparts.

1.2 BACKGROUND

This research seeks to find out the factors contributing to unemployment of women in Sekhukhune and Capricorn districts in the Limpopo Province. These two districts were chosen because the researcher knows them well, having grown up in Sekhukhune and having done high school studies in the Capricorn district. Sekhukhune is rural while Capricorn is urban, so the study can be considered as a comparison of rural-urban structures.

Generally, unemployment has a detrimental effect on the development of the country. Tax payers have to pay a lot more in order for the government to raise money for services such as: social grants (disabled, child, pensioners and others);for medical facilities, educational system (feeding schemes, textbooks, laboratories), and for policing unit, defence among others.

Gender gaps in sectoral segregation

Women are more limited in their choices for employment across sectors. This sectoral segregation has increased over time, with women moving out of

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agriculture in developing economies and out of industry in developed economies and into services. In 2012, at the global level, a third of women were employed in agriculture, nearly half were in services, and a sixth were in industry (ILO, 2012). Women's industrial share only slightly rose over the last two decades as most women moved out of agriculture and directly into services. In advanced economies, women's participation in industry halved, crowding more than 85% of them into services, primarily into service areas like education and health. In most developing economies, women moved out of agriculture, and into services, with the exception of East Asia, where women's employment in industry rose to a quarter of total participation (International Labour Organisation, (ILO) 2012).

Gender gaps in occupational segregation

Occupational segregation has been pervasive over time, with some evidence of a decline in the gap in the previous decade, and a stalling in this convergence in the past decade. From a sample of both advanced and developing countries, men were over-represented in crafts, trades, plant and machine operations, and managerial and legislative occupations. In contrast, women were over-represented in mid-skill occupations like clerks, service workers, and shop and sales workers. The initial impact of the crisis, in the advanced economies, seemed to have affected men in trade-dependent sectors more than women in health and education-related services. Conversely women were strongly hit in developing economies, in tradable sectors (ILO, 2012).

The four industries in South Africa, with the largest percentage of total employed women in 2013 were:

Education and Health, 36.2%;

Wholesale and Retail Trade, 13.1%;

Professional and Business services, 10.5%; and

Leisure and Hospitality, 10.3%.

The four industries in South Africa, with the smallest percentage of total employed women in 2013 were:

Mining, Quarrying and Oil and Gas extraction, 0.2%;

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Construction, 1.3%;

Information, 1.7%; and

Transportation and Utilities, 2.6%.

Source: Data from the Bureau of Labour Statistics (2013 Annual Averages).

The employment estimates include all people in work including those working part-time. People not working are classified as "unemployed" if they have been looking for work within the last four weeks and are able to start work within the next two weeks from the day of interview. Jobless people are those who have not been looking for work within the last four weeks or who are unable to start work within the next two weeks from the day of interview, are also classified as "economically inactive". Examples of economically inactive people include people not looking for work because they are students, looking after family or home, because of illness or disability or because they have retired. Employment figures measure the number of people in paid work and differ from the number of jobs because some people have more than one job. "Unemployment" figures measure people without a job or who have been actively seeking within the last four weeks and are available to start within the next two weeks.

1.3 STATEMENT OF THE PROBLEM

Limpopo tends to have the highest proportion of rural dwellers in South Africa, hence it can be expected that economic conditions in the province are inferior to the national average, with the consequence of high unemployment rate. However, the focal point of the study is the investigation of the main causes and the persistence of these high rates of unemployment, particularly that of women in the Limpopo province.

Women continue to face many barriers to entering the labour markets. These barriers do not only hold back women, but also hold back economic growth and developing countries with large gender gaps.

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A very small number of women are employed in highly paid professional occupations such as engineering, accountancy, architecture and law. Even well educated women tend to enter the teaching and nursing professions rather than in the management, scientific or technical occupations (Mafiri, 2002). Therefore, the study seeks to investigate whether gender, age, marital status, educational level, training, type of work offered and financial incentives like child grants are significant predictors of women's unemployment status in the Sekhukhune and Capricorn districts in the Limpopo province.

1.4 LOCATION OF THE STUDY AREAS

Sekhukhune is one of the five districts of the Limpopo province of South Africa. The seat of Sekhukhune is Groblersdal. The majority of its 967 126 people speak Northern Sotho (Census, 2001). The district is named after the natural region of Sekhukhune land. Sekhukhune District Municipality was established in December 2000. It consists of five local municipalities, namely Elias Motswaledi, Ephraim Mogale, Greater Tubatse, Fetakgomo and Makhuduthamaga. Sekhukhune is an area with a long and proud history and a place of majestic beauty with regal mountains, lush valleys and meandering rivers. Under the soil lie vast deposits of precious metals- so vast that today the area contains the largest reserves of platinum group metals in the world. Above its soil, sprout more than 2200 indigenous species of vascular plants, making Sekhukhune an area of exceptionally high biodiversity that is globally recognised. It is a land of natural beauty, unusual resource endowments and a compelling history dating back to the 16th century (http://www.sekhukhune.gov.za).

Capricorn District Municipality falls under the Limpopo province, located on the northern side of South Africa. It derives its name from the Tropic of Capricorn, along which it is situated. It is predominantly urban in nature and consists of the following five local municipalities: Aganang, Blouberg, Lepelle-Nkumpi, Molemole and Polokwane. Limpopo's capital city, Polokwane (previously known as Pietersburg), lies in the heart of Capricorn region (http://en.wikipedia.org/wiki/capricorn_district_municipality).

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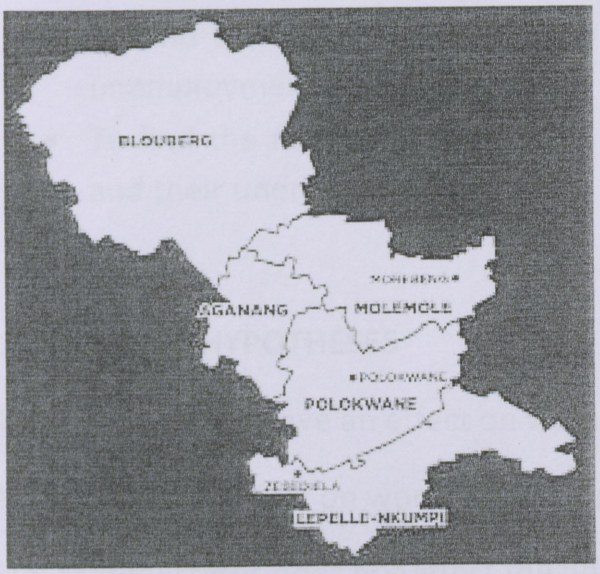


Fig 1.1 : Capricorn district

1.5 MAJOR RESEARCH QUESTION

The major questions posed in this study are: What is the level of unemployment and what are the factors that contribute to women's unemployment status in the Capricorn and Sekhukhune districts in the Limpopo province?

1.6 AIM OF THE STUDY

The aim of this research study is to find the factors that contribute to unemployment of women in the Capricorn and Sekhukhune districts of the Limpopo province.

1.7 OBJECTIVES OF THE STUDY

The objectives of this study are:

- To examine the effect of women's age on unemployment.
- To determine the relationship between women's marital status and their unemployment.

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- To find the relationship between women's educational level and their unemployment.
- To find the relationship between the number of children a woman has and their unemployment.

1.8 STUDY HYPOTHESES

Ho: Age does not have an effect on women's unemployment.

Ha: Age has an effect on women's unemployment.

Ho: Marital status does not affect the unemployment of women.

Ha: Marital status affects the unemployment of women.

Ho: Educational level does not have an effect on women's unemployment.

Ha: Educational level has an effect on women's unemployment.

Ho: The number of children a woman has does not affect her unemployment.

Ha: The number of children a woman has affects her unemployment.

1.9 SIGNIFICANCE OF THE STUDY

The findings of this study could shed some light on how to deal with these factors that contribute to women's unemployment; how to achieve equal employment opportunity and also remove the obstacles and barriers to women's participation in the workplace.

1.10 DEFINITION OF CONCEPTS

Unemployment – Barker (1999) defines an "unemployed person" as one who is without work although he or she is currently available for work and is seeking or wanting to work.

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The "unemployment rate" is defined as the number of unemployed persons taken as a percentage of the economically active population which includes both the employed and unemployed.

A woman is an adult (aged 20 years plus) female human being (Collins Advanced Dictionary).

"Women unemployment" is a term used to refer to unemployed female adults who are currently available for work and/or seeking for a job.

1.11 CONCLUSION

This chapter introduced the matters that needed to be investigated, that is factors contributing towards women unemployment. It also outlined the background, problem statement, research question, motivation to conduct this study, aim and objectives of the study, hypotheses, significant of the study, the scope of the study and definition of major concepts.

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CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This review discusses literature relevant to the study. It starts with types of unemployment and then details several factors that contribute towards women unemployment.

2.2 Unemployment

Unemployment is caused when someone is laid off, fired or made to quit the job but the person is still looking for a job. This type of natural unemployment always occurs even in a healthy economy. If someone retires, goes back to school or leaves the work force to take care of children or other family members that is not unemployment. Also, if someone gives up looking for work, they are also not counted as unemployed by the government. Sometimes unemployment is a result of advanced technology, such as computers or robots, which replace workers with machines. If workers are not retrained, they may not have the skills needed to get and keep their jobs. This is known as "structural unemployment". Unemployment can also be caused by job outsourcing; when a company for example, moves its manufacturing or call centres to another country where labour costs are cheaper. This occurred in many states after North American Free Trade Agreement (NAFTA) was signed in 1994. It also occurred when workers in China and India gained the skills needed by American companies. Large scale unemployment is caused when consumer demand slows down resulting in businesses losing too much profit. If businesses do not expect sales to pick up anytime soon, they lay off workers. This usually happens during the recession phase of business cycle (http://www.almanar.job).

With the coming generation, the skilled and educated population is rising at a high rate compared to the rate at which job opportunities are being created, thus producing unemployment. Poor planning by governments has also caused

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unemployment, when the government rejects sensitive sectors like agriculture which employs many people. People are unemployed because of over-population, that is, when there are not enough jobs for people (http://www.almanar.job).

2.2.1 Women unemployment

There are wide variations in female labour force participation between and within countries in the world. Available statistics show that labour force participation rates are lower for women than men in most countries. However, official labour statistics do not adequately reflect women's activities especially in rural areas where production systems are still predominantly house-hold or family-based. A great deal of women's economic activities, especially for family consumption and unpaid family labour are not reflected in official statistics (ILO, 2003).

In rural areas, especially in Sub-Saharan Africa, the proportions of women concentrated in agriculture and food production are higher than that of men (ILO, 2003). For several countries statistics of informal sector wage employment are often unavailable or not disaggregated by gender. Although an increasing number of women are now employed in the formal sector, waged employment whether in public or private sector has offered relatively limited opportunities for women as men dominate it. Women are found mainly at the lower echelons in the formal sector (ILO, 2003). The share of women employed in industry is low; given the limited opportunities in the formal sector, the majority of women in urban areas are self-employed in the informal sector. The most common entrepreneurial activity for women is retail trade, including within and cross-border trading. Other activities include handicrafts, food processing and cottage industries (ILO, 2003).

2.2.2 Factors affecting women's unemployment

2.2.2.1 Women's unemployment and age

Age is an important factor since the young are more likely to search rather than get 'locked-in' to an undesirable job. Younger women are more able to

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afford unemployed job-search because they have fewer financial commitments than older women do. Moreover, they may be more ignorant about what their skills can command in the labour market, that is, they may have higher reservation wages. It is more difficult to explain this phenomenon among the older age groups. According to a study carried by Kryger (1999) on unemployment, the probability of being unemployed initially decreases with the age but then increases as the women becomes older. For a 20 year old woman, the probability that she be unemployed decreases by 0.7 of a percentage point each additional year. At 40 years, it decreases by 0.1 of a percentage point and at 45 years, the probability of unemployment starts to increase by a small amount with age (Kryger, 1999).

Unemployment does not occur openly in all occupations or sectors of society. Workers under 25 years of age are far more likely to be unemployed than older workers. The jobs held by younger workers are often more marginal and younger workers leave their jobs more often than older women do.

Younger women who entered the labour market recently experience higher levels of unemployment than middle-aged women, who are better established in employment. Amongst men, the relationship between age and unemployment remains relatively steady until their early 50s when it begins to rise, peaking at age 59. The age effects for women are considerably different with the employment rate continuing to decline after the age of 50. The sharp drop in unemployment rates, among both men and women close to age 60, may be attributed to worker retiring from the labour market (Kryger, 1999).

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2.2.2.2 Women unemployment and marital status

Single parents are more likely to be unemployed long term than the married parents. A study by the Urban Institute shows that the long term unemployment rate for unemployed single parents was 55%, compared to 44% for unemployed married parents (The Urban Institute, 2013). The vast majority of children in single parent families, being 85%, live with their mothers. The regular unemployment rate for women who maintain families was substantially higher (8.4%) than the overall unemployment rate (6.3%) in May 2014.

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Despite the number of dual-earner families, the majority of married women still earn less than their husbands, perpetuating the status of wives as secondary wage-earners. The fact that wives are secondary wage-earners is convincing evidence of the continuing differences in the kinds of work that men and women do at their advancement and their earning (Hertz and Marshall, 2001).

2.2.2.3 Women unemployment and education level

The more education a woman possesses, the less likely she will be unemployed. For instance, the U.S Bureau of Labour Statistics (2006) revealed that about 76% of those with less than a high school diploma were unemployed, but only 2.3% of college graduates were unable to find a job. Employment status is usually determined by education level, whereby women with high education level can access employment more than those with low education level. However, it must be noted that there are some jobs where education is not essential.

Girls are still more often excluded from secondary education, vocational and tertiary education than boys, particularly in West and South Asia (United Nations, 2007).This education gap has implications for the ability of girls and women to access economic opportunities later in life. The rapid increase in women's labour force participation rate noted in the Middle East over the past decade has coincided with massive investments in education (ILO, 2008).

The more women get educated, the higher their chances of getting employed. This relationship is as strong as it is in the male labour force. The channel through which this relation arises is the same, namely labour turnover, almost half of which involves unemployment. However, the relation between education and turnover is mediated largely by educational differences in on-the-job training among men, while educational differences in labour force attachment are the main source of differences among women. This is because levels of educational differences in on-the-job (in-house) training are small among women, while non-participation in the labour market and educational differences in it are quite small among men. Recent growth in women's work has reduced their inter-labour force turnover and their unemployment rate to

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the point of eliminating any sex differentials. On-the-job training of women appears to have increased, though it still remains limited.

A major explanation of the education effect on unemployment was that, the more educated workers tend to have opportunities to change employers less frequently than other workers. In turn, such workers stronger attachment to the firm is, in a large measure attributable to their more intensive learning and training on the job. The positive correlation of education and training is a reflection of the greater learning abilities, opportunities and preferences of the more educated persons. And the negative correlation between training and turnover reflects the fact that, to some extent, skills acquired by training are firm-specific, thus it is not fully transferable to other firms.

Longer education spells lower participation rates for young women. Whether higher education leads to greater gender equity, in the labour market remains questionable. Certainly, the higher the investment in education (both in terms of years and real cost), the higher the opportunity costs of inactivity. This translates into a stronger tendency for women with higher education to participate in the labour market. Moreover, women with higher education might have better opportunity to work in occupations or sectors where gender equality, both in career opportunities and wages is better. For example, Handy *et al.* (2003) examine women entrepreneurs in a particular segment of the non-profit sector in India to determine which factors influence such self-selection and they realised that education is one of the main drivers.

According to the World Bank in 2008, the percentage of female unemployment with primary education was reported at 12.50, that of secondary education was 84 and that of tertiary education was 0.70, (www.tradingeconomics.com).

The picture of the educated employed reveals that the unemployment rate varies by the type of degree. In Tunisia, the unemployment rate is the lowest for engineers (24.5%), and high for graduates in economics, management and law (47.1%) and in social sciences (43.2%) among university-educated youth (Stampini and Verdier-Chouchane, 2011).

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2.2.2.4 Women's unemployment and gender gap

The unemployment gender gap is defined as the difference in the employment picture between female and male. According to ILO (2008) report, the status of women at the labour markets throughout the world has not substantially narrowed gender gaps in the workplace. Women's economic empowerment currently faces three major challenges: women are less likely to have a paid job; women's jobs are more likely to be concentrated in the informal economy and in low value-added sectors; and in low-paid jobs characterized by poor working conditions. The gap between female and male employment worldwide is very significant. According to the ILO estimates, the share of employed people in the world's working-age population (the employment-to-population ratio) was 49.1% for women and 74.3% for men in 2007 (ILO, 2008).

The difference in the female and male share of employed people, in the working age population is above 40 percentage points in South Asia, the Middle East and North Africa. At the other end of the spectrum, the gaps are below 20 percentage-points in East Asia. As documented in a relatively recent cross-country study of 18 sub-Saharan countries, countries with the highest male employment ratio also tend to have the lowest gender gap (Kolev and Sirven, 2007).

The general gender gap is explained by multiple factors. The most important among these factors are social and cultural patterns which keep women out of the labour market as well as a tendency of government authorities to invest too little attention and resources in the promotion of women's employment: women are "time poor". Due to the gender division of labour in the family prevailing in many countries, women's responsibility for unpaid household labour leaves only few hours daily for engaging in work outside the household (United Nations Development Fund for Women (UNIFEM), 2005). The situation is further aggravated in cases where women are the sole head of household. Women's ability to free up time depends, to a great extent, on the availability of services and infrastructure, such as water and good access roads.

Cultural beliefs and norms may keep women out of the labour market. In many cultures - society, in families, among employers and even among women themselves there is little or no acceptance of women taking up employment. In many rural areas of Afghanistan for example, women do not have permission

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to leave their house, let alone take a job outside the household (Integrated Regional Information Networks (IRIN), 2007). In sub-Saharan Africa early marriage is common and is often seen as a key factor why women fail to access the labour market. The Organisation for Economic Co-operation and Development (OECD) database on Gender, Institutions and Development confirms this by looking at a broader set of factors related to discrimination against women (OECD, 2008). Using a combined measure for family code, physical integrity, civil liberties and ownership right, the OECD finds that discriminatory institutions have a direct impact on women's economic development (OECD, 2006). Finally, it should also be noted that customary norms and lack of access to information often prevent women from claiming their rights and exploiting opportunities.

Across the Gallup World Poll sample, the unemployment rate among young women is 18% compared to 15% for men; across Sub-Saharan Africa the unemployment rate for women is 16% compared to 14% for men and in North Africa, 31% of women are unemployed compared to 19% of men. According to Labour Force Survey (LFS) data, the unemployment rate among women in Rwanda is only 60% that of men and in Niger this ratio is 50%. This reveals that unemployment is slightly higher among women than men and there are considerable variations among countries.

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2.2.2.5 Women's unemployment and pregnancy

The evolution of labour-force behaviour in connection to pregnancy and child birth is documented in the 2008 Current Population Report on "Maternity Leave and Employment Patterns of First time Mothers: 1961-2003". This report shows that women are now more likely to work, both during pregnancy and after child birth. In 1976-1980, the fraction of women who stopped working two months or more before the end of pregnancy was 41%; that ratio dropped to 23% in 1996-2000. Among women who worked during pregnancy, 36% quit their jobs in 1981-1985, but this fraction dropped to 26% by 1996-2000. Leave arrangements that allow women to keep their positions have become more widespread. The fraction of women who used paid/unpaid leave after child birth increased from 71% in 1981-1985 to 87% in 1996-2000.

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2.2.2.6 Women's unemployment and the number of children a woman has

Children are affected by their parents' long-term unemployment. The number of children living with a parent seeking for work for six months or more has tripled since the start of the recession in 2012. In an average month in 2013, 2.3 million children across South Africa were living with a parent who had been looking for work for six months or more, three times the number in 2007. In the United States, some states have large percentage of children living with unemployed parents. The ten states in the United States with the largest percentage of children living with a long-term unemployed parent are Rhode Island, Illinois, Georgia, Kentucky, Michigan, Connecticut, North Carolina, California, New Jersey and Tennessee. The highest percentage of all is in the District of Columbia (The Urban Institute, 2013).

Mothers' participation in the Labour Force

In 2013, Labour Statistics provided figures showing that about 69.9% of women had children under 18 years, 74.7% with children 6-17 years, 63.9% with children under-6 years, 61.1% with children under-3 years and 57.3% mothers of infants participate in the labour force. The labour force participation rate for single mothers with children under 18 years of age was 74.2% in 2013 and 67.8% for married mothers. Single mothers include never married, married-spouse absent, divorced, separated and widowed persons, (Bureau of Labour Statistics, 2013).

2.3 CONCEPTUAL FRAMEWORK

The conceptual framework shows the factors that are associated with women's unemployment. The study focussed on the following factors: age, marital status, educational level and the number of children a woman has. These are the factors that were viewed as contributing to women's unemployment.

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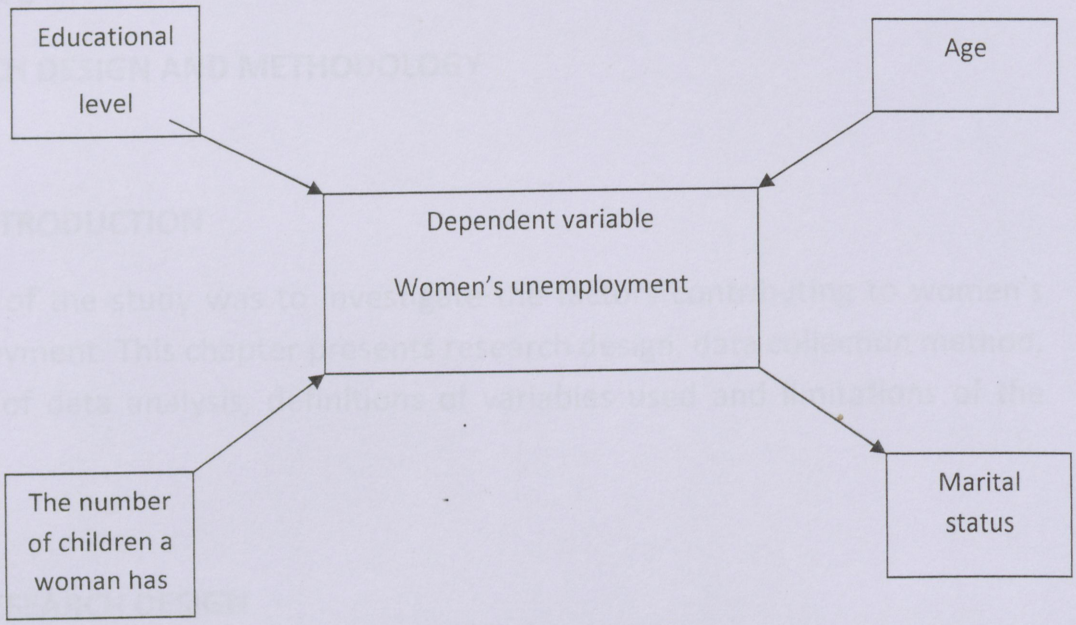


Fig 2.1: Conceptual framework for women's employment

2.4 CONCLUSION

In conclusion, the literature review has highlighted several factors that contribute towards women's unemployment as reported by different researchers, internationally, including researchers in South Africa. The literature has established that the impact of factors on women's unemployment is applicable to all women, irrespective of whether the country is classified as developed or developing. This is a global problem as highlighted by international and local literature.

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CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The aim of the study was to investigate the factors contributing to women's unemployment. This chapter presents research design, data collection method, method of data analysis, definitions of variables used and limitations of the study.

3.2 RESEARCH DESIGN

The study focused on women aged between 20-54 years because women in this age bracket are active, strong, healthy and capable of doing (any) job offered to them. The purpose of this study was to determine the level of unemployment and to recommend strategies that will minimise women's unemployment as women need to manage households. If each "household manager" is employed, it simply means that the country will develop, regardless of the job type these women are involved in. The survey was conducted in the Capricorn and Sekhukhune districts in the Limpopo Province. The interviews took place in the respective homes of respondents and each respondent had about 15-20 minutes to answer questions. The probability sampling method was used because it enables inference to be done. Using proportional allocation, about 2 600 women from Capricorn district and 2 000 women from Sekhukhune district were selected because the population size of Capricorn district is larger than that of Sekhukhune district.

3.3 DATA COLLECTION METHOD

Primary data were used. Before collecting the data, round trips were made to meet with the chiefs of the villages and chairpersons of the Civic Associations in towns and townships where the objectives of the project were explained to them and were entreated then to, in turn, sensitize the members of their community about the project.

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A questionnaire was used as an instrument to collect data which implies that the study was quantitative. Before the actual study, the researcher first tested the instrument to be used, for the purpose of checking for faults in the questionnaire and rectifying them. Faults, for example, leading questions, ambiguous questions, questions which convey a position for or against the topic being investigated, were rectified. Some of the corrections were done after the pilot study. Females who are similar to intended respondents were asked questions before conducting the real study to test the appropriateness of the questions.

3.4 Data analysis

The data obtained were analysed using SPSS. Basic descriptive analysis and multivariate analysis were done. Diagnostic analysis was employed to check model fit. The study employed multivariate analysis, including regression models for analysis to investigate which model best fits the data.

The independent variables and their coding are as follows:

X1 = marital status (1= single, 2=married)

X2 = age (20-54)

X3 = the number of children a woman has (0-10)

X4 = family background (1= low class, 2=middle class, 3= high class)

X5 = education level (1= primary, 2= secondary, 3= tertiary)

3.4.1 Multivariate Analysis

Multivariate analysis was performed to assess the factors relating to women (un)employment. Loglinear models, multiple logistic (multinomial) regression and Generalized Linear Models (GLM) analyses were performed because the data comes from a survey using a questionnaire and most of the variables are categorical. The employment question, for example, which is the subject of investigation as a response variable, is categorical with a binary response.

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Loglinear models are ANOVA-like models for the log-expected cell counts of contingency. They are logarithmic versions of the general linear model. They include general loglinear model, logit model and model selection techniques. The general loglinear model is a technique for modelling a categorical response variable, which are often count data that follows a Poisson distribution or frequency in a cross tabulation form that follows a multinomial distribution, based on a set of factors or covariates. The maximum number of factors or covariates allowed is ten. The procedure analyses the frequency counts of cases falling into each category of a cross classification of two or more variables. Each cross classification leads to a cell. The variables forming the cross classification are called factors. The model selection of loglinear analysis procedure analyses multiway crosstabulations (contingency tables). It fits hierarchical loglinear models to multidimensional crosstabulations using an iterative proportional fitting algorithm. This procedure helps to find out which categorical variables are associated.

The logarithm of the cell frequencies is a linear function of the logarithms of the components:

$Outcome_i = Model_i + error_i$

$Ln(O_i) = ln(Model_i) + ln(e_i);$

- With the following assumptions:
- Each categorical variable is called a factor
- Each case should fall into only one cross-classification category
- All expected frequencies should be greater than 1, and not more than 20% should be less than 5.

In order to test the interaction between two variables, say A and B, in Hierarchical loglinear models, we test the "goodness of fit" of a model that contains only the main effect of A and the main effect of B. A "bad fit" of that model results in a significant likelihood ratio chi-square ($LR\chi^2$) statistic, and we conclude that the interaction must be considered to fit the data.

In order to test, say, a three-way interaction between variables A, B and C, we test the goodness of fit of a model containing only two-way interactions (A*B, A*C, and B*C). If the model containing only 2-way interactions does not fit

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(significant LRχ^2), we conclude that the three way interaction (A*B*C) must be considered.

The same logic/procedure can hold for higher-way (i.e. 4-way, 5-way, etc.) interactions.

Loglinear models combine features of standard chi-square tests (determining the fit between observed and expected cell counts) with those of ANOVA (simultaneous testing of main effects and interactions within multi-factorial designs).

They do not differentiate between 'dependent' and 'independent' variables (the response variable is always treated as a factor!)(Hair jr et al., 1995).

They are applicable to the multinomial case (not only binary response categories!).

Almost no requirements needed (except that the sample has to be sufficiently large).

They can be used in an "explorative" model-building fashion (find the most parsimonious model that describes the data best) as well as for hypothesis testing (simultaneous testing of all factor combinations).

Hierarchical loglinear models are particularly useful for

- The analysis of multi-dimensional (multi-factorial) categorical data
- Categorical data with more than two levels (multinomial model), not just binary data (binomial model)
- Multi-dimensional dependent variables.

Generalized linear models (GLM) are a broad class of statistical models that relate the mean of the response variable to a combination of linear predictors. These Models can handle more complicated situation such as analysing simultaneously the effects of several explanatory variables. The structure of the model describes patterns of association and interaction. The size of the parameters determines the strength and importance of effects. GLM's encompass ordinary regression and ANOVA models for continuous responses and also models for discrete responses (Hair jr et al., 1995, Agresti, 1996).

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These models comprise three components: random component identifies the response variable and selects a probability distribution for it; the systematic component specifies the explanatory variables as a linear combination; and the link function connects the expected value of random component and systematic component.

The random component can assume any distribution in the exponential family of distributions. Distributions belong to the exponential family of distributions if their probability mass (or density) functions can be expressed in the form:

$$f(y; \theta, \phi) = \exp\left\{\frac{y_i\theta_i - b(\theta_i)}{a_i(\phi)} + c(y_i, \phi)\right\}$$

where,

y = random component

a, b and c = arbitrary functions

ϕ = dispersion parameter

θ = canonical parameter

Multiple logistic (multinomial) regression is logistic regression in which more than one predictor variable is used to classify the binary response, (Larose, 2006: 178 – 183). Logistic regression refers to methods for describing the relationship between a categorical response variable and a set of predictor variables. The Logistic regression assumes that the relationship between the predictor and the response variable is nonlinear. Its model assumption is different from that of linear regression. Since the response of logistic regression is dichotomous, the errors can take only one of two possible forms: ($Y = 0$ or $Y = 1$), with their probabilities [1 - $\pi(x)$ and $\pi(x)$] for absence and presence respectively. The variance of the error term, ε, is $\pi(x)[1 - \pi(x)]$ which is the variance for a binomial distribution. The response variable in logistic regression, Y, is assumed to follow a binomial distribution with probability of success, $\pi(x)$, (Larose, 2006: 155 – 166).

Discriminant function analysis predicts an outcome. It is used when the dependent is categorical with the predictor independent variables being categorical or not. Discriminant involves the determination of a linear equation like regression that will predict which group the case belong to. The form of equation or function is:

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$D=v_1x_1 + v_2x_2 + v_3x_3 =.....v_ix_i + a$

Where D=discriminate function

V= the discriminant coefficient

X= respondent's score for that variable

a= constant

i= the number of predictor variables

Assumptions of discriminant analysis

- The observations are a random sample;
- each of the allocations for the dependent categories in the initial classification are correctly classified;
- There must be at least two groups or categories, with each case belonging to only one group so that the groups are mutually exclusive and collectively exhaustive;
- Each group or category must be well defined.

3.4.2 Statistical tests and Model selection & evaluation

Omnibus tests were used to test the association between factors and or dependent and independent variables. The AIC (Akaike's Information Criterion) and its deviance were used as criteria for judging the quality of the model. A Goodness fit of the test uses deviances to assess how adequate a model fits into a set of observations. The analytical tools employed for this study was a logit model and chi-square test. A logit model was a useful measure to study the relationship between a binary response variable and one or more explanatory variable(s).

The link function was used, which was identified as the log link function to describe the nature of the relationship between the mean of the random component and each determinant. The regression equation for all models is:

$\log \mu_\gamma = \beta_0 + \beta_1X_1 + \beta_2X_2 +.....+ \beta_iX_i$

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3.5 Definitions of variables used

- Marital status is the fact of being married or single. Single women in this study include all women who fall under one of the following: divorced, separated, widow, never been married and lived together previously but not anymore. Married women are women who have husbands or living together with their lifetime partners.
- An employed woman is a woman who is currently doing a job for payment. The job can be temporary, part time or full time. The unemployed women include all women who are not working, retrenched, quit working, still studying and others.
- Low class – family getting income of less than R5000 per month;
- Middle class – family getting income of between R5001 and R15000 per month;
- High class – family getting income of between R15001 and more per month.
- Age is the number of years that a person has lived.

3.6 LIMITATIONS OF THE STUDY

Focus group discussions were not conducted. This would have given the women an opportunity to share their views and experiences in an open forum about women's unemployment; this limitation was due to time frame. Only women were interviewed; interviewing their partners or spouses would have given us much broader picture or opinion about women's unemployment.

3.7 CONCLUSION

This chapter outlined the research methodology for the study. The pilot study highlighted some gaps such as the need to rephrase the question before the actual interviewing could start. A quantitative research approach allowed the researcher to identify and estimate the level of factors contributing towards women's unemployment. Definitions of variables used were also provided. The researcher was therefore satisfied that the necessary data was collected through oral questionnaire which highlighted critical issues that were not envisaged.

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CHAPTER 4

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results from the analysis of the data. The data come from Sekhukhune and Capricorn districts and covered sampled women aged 20-54 years concerning the factors contributing towards women unemployment. This chapter begins with basic data summary, followed by, loglinear models, generalized linear models, multiple logistic (multinomial) regression and finally by discriminant analyses. Loglinear models, generalized linear models and multiple regression techniques have been used in this analysis, because as stated in chapter three these methods are more suitable for the type of data we have here. This is a survey data with categorical variables so these techniques are the most suitable.

Hierarchical loglinear models help us to find interactions among variables at third, fourth and even higher levels, though themselves not showing dependent and independent variables. Once interactions have been detected in hierarchical loglinear analysis, generalized linear modelling now enables us to find factors that affect the dependent variable(s). Multiple logistic (Multinomial) regression and generalized linear modelling do almost the same analysis because they all use link function, logit model (Larose, 2006: 178 – 183).

4.1.1 Basic Data Analysis: Results from Sekhukhune and Capricorn districts (combined data)

Table 4.1.1 shows that out of 4600 respondents from both Sekhukhune and Capricorn districts, only 28.9% of them were employed, 56% were single (not married), 8.2% had primary education, 72.3% had secondary education and 19.4% had tertiary education. Fifty-six and a half percent of the women were from Capricorn district and 43.5% from Sekhukhune. In Table 4.1.2, the unemployed in Sekhukhune is a whopping 85.3% while that of Capricorn is 60.2%; for the marital status, 61.5% of the women were married in Capricorn as against only 21.1% in Sekhukhune; 10.0% had primary education, 82.4%

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with secondary education and 7.6% tertiary education in Sekhukhune, while the proportions are 6.9% with primary education, 64.6% with secondary education and 28.5% tertiary education in Capricorn. The table further shows that women who come from low class (poor background), account for 49.5%, middle class (average background) account for 50.1% and high class (rich background) make up 0.4% in Sekhukhune; as against 51.3% in the low class, 44.4% in the middle class and 4.3% in the high class in Capricorn.

Table 4.1.1: Basic Data Summary

		N	Marginal Percentage
Are you employed?	Yes	1331	28.9%
	No	3269	71.1%
District	Sekhukhune	2000	43.5%
	Capricorn	2600	56.5%
marital status	Single	2578	56.0%
	Married	2022	44.0%
If yes, what is your highest standard passed?	Primary	379	8.2%
	Secondary	3327	72.3%
	Tertiary	894	19.4%
Please state the status of your family background	low class	2323	50.5%
	Middle class	2157	46.9%
	Higher class	120	2.6%
Valid		4600	100.0%
Missing		0	
Total		4600	
Subpopulation		1620[a]	

a. The dependent variable has only one value observed in 1229 (75.9%) subpopulations.

The proportion of women from the low class is 50.5%, from the middle class is 46.9% and from the high class is 2.6% for the combined data (i.e. both districts). The mean age for the combined data is 33.05 years and the standard deviation is 8.2 years; the mean number of children is 2.18 and the standard deviation is 0.18. The minimum age of the women is 20 and the maximum 54 years, while the minimum number of children that a woman has is zero and the maximum is 10.

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Table 4.1.2: Case processing summary

Variables	Categories	Capricorn		Sekhukhune		Total (combined)	
		N	%	N	%	N	%
Employed?	Yes	1036	39.8	295	14.75	1331	28.9
	No	1564	60.2	1705	85.25	3269	71.1
Marital Status	Single	1000	38.5	1578	78.9	2578	56.0
	Married	1600	61.5	422	21.1	2022	44.0
Highest educational level	Primary	179	6.9	200	10.0	379	8.2
	Secondary	1680	64.6	1647	82.4	3327	72.3
	Tertiary	741	28.5	153	7.6	894	19.4
Family Background	Low class	1331	51.3	990	49.5	2323	50.5
	Medium	1154	44.4	1003	50.1	2157	46.9
	High	113	4.3	7	0.4	120	2.6
Mean Number of children		2.23		2.12		2.18	
Mean age		33.9		31.95		33.05	

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4.2 Hierarchical Loglinear Analysis

4.2.1. Sekhukune and Capricorn (Combined data) – Hierarchical Loglinear

Table 4.2.1a presents data information and Tables 4.2.1b to 4.2.1d present further information, viz: Backward Elimination Statistics, parameter estimates and convergence information, all from the Hierarchical loglinear analysis.

Table 4.2.1a: Data Information

		N
Cases	Valid	4600
	Out of Range[a]	0
	Missing	0
	Weighted Valid	4600
Categories	Are you employed?	2
	District	2
	marital status	2
	If yes, what is your highest standard passed?	3

a. Cases rejected because of out of range factor values.

In Table 4.2.1b we see that there is an interaction between employment, marital status and the level of education. There are equally interactions between and among the following:

- Employment and district
- Employment and marital status
- Employment and the level of education
- District and the level of education, and
- District and marital status.

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Backward Elimination Statistics

Table 4.2.1b: Step Summary

Step[a]		Effects	Chi-Square[c]	df	Prob	Number of Iterations
0	Generating Class[b]	Employed*District*maritalStatus*HiggestStandard	.000	0	.	
	Deleted Effect 1	Employed*District*maritalStatus*HiggestStandard	3.051	2	.217	3
1	Generating Class[b]	Employed*District*maritalStatus, Employed*District*HiggestStandard, Employed*maritalStatus*HiggestStandard, District*maritalStatus*HiggestStandard	3.051	2	.217	
	Deleted Effect 1	Employed*District*maritalStatus	.543	1	.461	5
	2	Employed*District*HiggestStandard	3.292	2	.193	4
	3	Employed*maritalStatus*HiggestStandard	8.804	2	**.012**	3
	4	District*maritalStatus*HiggestStandard	11.506	2	**.003**	4
2	Generating Class[b]	Employed*District*HiggestStandard, Employed*maritalStatus*HiggestStandard, District*maritalStatus*HiggestStandard	3.594	3	.309	
	Deleted Effect 1	Employed*District*HiggestStandard	3.535	2	.171	5
	2	Employed*maritalStatus*HiggestStandard	8.843	2	**.012**	5
	3	District*maritalStatus*HiggestStandard	11.519	2	**.003**	5
3	Generating Class[b]	Employed*maritalStatus*HiggestStandard, District*maritalStatus*HiggestStandard, Employed*District	7.129	5	.211	
	Deleted Effect 1	Employed*maritalStatus*HiggestStandard	9.536	2	**.008**	6
	2	District*maritalStatus*HiggestStandard	10.804	2	**.005**	6
	3	Employed*District	59.976	1	**.000**	2
4	Generating Class[b]	Employed*maritalStatus*HiggestStandard, District*maritalStatus*HiggestStandard, Employed*District	7.129	5	.211	

a. At each step, the effect with the largest significance level for the Likelihood Ratio Change is deleted, provided the significance level is larger than .050.

b. Statistics are displayed for the best model at each step after step 0.

c. For 'Deleted Effect', this is the change in the Chi-Square after the effect is deleted from the model.

Table 4.2.1b of the Backward Elimination Statistics further shows that in Step 0, the interaction among employment, district, the level of education and marital status is not significant. The change in chi-square from the saturated model to the model without the four-way interaction was tested and found to

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be not significant; thus the interaction can be dropped. In Step 1, the change in chi-square from three-way interactions to the models without the three-way was tested and found to be not significant for some of them. The three-way interaction for some of them, viz: employment, education level, and marital status, on one hand; and district, marital status and the education level, on the other hand, cannot be dropped because it is significant. Similarly, employment and district cannot be dropped. In Step 2, the change in chi-square again from three-way interaction to the models without the three-way was not significant for employment, district, and the level of education, and thus can be dropped. In Step 3, the change in chi-square again was not significant for employment, district, and the level of education, and thus can be dropped. In Step 3, the change in chi-square again from three-way interaction to the models without the three-way was significant for employment, marital status and the level of education; and thus cannot be dropped. Similarly, the two-way interaction between employment and district cannot be dropped.

Table 4.2.1c and Table A2 (in the appendix) confirm that the following interaction terms cannot be dropped: Employment and district; Employment and marital status; and District and marital status and thus consequently affect the interaction of Employment, marital status and the level of education which cannot also be dropped.

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Table 4.2.1c :Hierachical Loglinear – Parameter Estimates

Effect	Parameter	Estimate	Std Error	Z	Prob	95% Lower	95% Upper
Employed*Dist*Marital *LevelEduc	1	.092	.068	1.360	.174	-.040	.224
	2	-.064	.040	-1.589	.112	-.142	.015
Employed*Dist*Marital	1	.032	.037	.852	.394	-.041	.105
Employed*Dist*LevelEduc	1	.083	.068	1.228	.220	-.049	.215
	2	.002	.040	.044	.965	-.077	.080
Employed*Marital*LevelEduc	1	.150	.068	2.223	**.026**	.018	.282
	2	-.120	.040	-3.004	**.003**	-.199	-.042
Dist*Marital*LevelEduc	1	-.023	.068	-.340	.734	-.155	.109
	2	.045	.040	1.114	.265	-.034	.123
Employed*Dist	1	-.152	.037	-4.075	**.000**	-.225	-.079
Employed*Marital	1	-.128	.037	-3.430	**.001**	-.201	-.055
Dist*Marital	1	.379	.037	10.152	**.000**	.306	.452
Employed*LevelEduc	1	-.631	.068	-9.352	**.000**	-.764	-.499
	2	-.129	.040	-3.220	**.001**	-.207	-.050
Dist*LevelEduc	1	.324	.068	4.805	**.000**	.192	.457
	2	.106	.040	2.645	**.008**	.027	.184
Marital*LevelEduc	1	-.068	.068	-1.003	.316	-.200	.065
	2	.058	.040	1.452	.146	-.020	.137
Employed	1	-.544	.037	-14.550	**.000**	-.617	-.470
Dist	1	-.324	.037	-8.684	**.000**	-.398	-.251
Marital	1	.077	.037	2.052	**.040**	.003	.150
LevelEduc	1	-1.147	.068	-16.996	**.000**	-1.280	-1.015
	2	1.251	.040	31.239	**.000**	1.172	1.329

Table 4.2.1d: Convergence Information

Generating Class	Employed*District*maritalStatus *HiggestStandard
Number of Iterations	1
Max. Difference between Observed and Fitted Marginals	.000
Convergence Criterion	1.212

Goodness of Fits-Test

The goodness-of-fit table in Table 4.2.2 presents two tests of null hypothesis which show that the final model which comprises: employment, district, marital status and the level of education, adequately fits the data. But as stated earlier this model cannot show dependent and independent variables so we now look for the relationship as well as the effect that the independent variables have on the dependent variable using generalized linear models.

Table 4.2.2: Goodness-of-Fit Tests

	Chi-Square	Df	Prob
Likelihood Ratio	.000	0	.
Pearson	.000	0	.

4.3 Generalized Linear Models (GLM)

4.3.1 Results from the Sekhukhune and Capricorn districts (combined data)

Tables 4.3.1a – 4.3.1d, below give the results from GLM analysis.

First, Table 4.2.3a which shows the Omnibus test makes it clear that there is a significant relationship between the dependent variable and the independent variables collectively considered together. Thus the independent variables have collectively improved the model compared with the intercept-only model.

Table 4.3.1a Omnibus Test[a]

Likelihood Ratio Chi-Square	df	Prob
1154.474	7	.000

Dependent Variable: Are you emplyed?

Model: (Intercept), maritalStatus, HiggestStandard, FamilyBackground, Age, No.ofChildren

a. Compares the fitted model against the intercept-only model.

The systematic component in this study identified the predictors as: district (1=Sekhukhune, 2= Capricorn); marital status (1=single, 2=married); education level (1=primary, 2=secondary, 3=tertiary); family background (1=low class, 2=middle class, 3=high class); age and number of children. The link function identified as the log link function was used to describe the nature of the relationship of the random component and each determinant. The combination of these components yields a GLM of the form expressed in equation 1 below:

The following model is derived from Table 4.3.1b of the parameter estimates:

$\log_M$= .474 -.783District$_1$ - .628Maritalstatus$_1$ +.245Familybackground$_1$ +.366Familybackground$_2$ - 3.271Educationallevel$_1$ -1.931Educationallevel$_2$ ---------1

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Equation (1) tells us that the logarithm of employment (employed) is negatively related to district (Sekhukhune), marital status (single), education level (primary,1 and high,2), but positively related to family background (low, 1 and medium, 2).

This interprets that employment level is lower in Sekhukhune (compared to Capricorn), for women who are single (compared to the married) and also for women with low educational level (primary and high school graduates) (compared with those with tertiary). Employment level however increases for women in the low class and the middle class family background (compared to those from the high class background). Furthermore, when we compare the employment level with primary and high school graduates, we see that the level is much lower for primary than for high school graduates, which means that women with only primary school certificates are most at risk for finding jobs. Conversely, women from the middle class family background have better chance at finding jobs than those from the low class family background.

Table 4.3.1b Parameter Estimates

Parameter	B	Std Error	Hypothesis Test		Wald Chi-Square	95% Wald Confidence Interval	
			Df	Prob		Lower	Upper
(Intercept)	.474	.2203	1	.031	4.637	.043	.906
[District=1]	-.783	.0885	1	**.000**	78.269	-.957	-.610
[District=2]	0_a	.	.	.	.	.	.
[maritalStatus=1]	-.628	.0834	1	**.000**	56.735	-.791	-.465
[maritalStatus=2]	0_a	.	.	.	.	.	.
[FamilyBackground=1]	.245	.2219	1	.270	1.217	-.190	.680
[FamilyBackground=2]	.366	.2199	1	.096	2.764	-.065	.797
[FamilyBackground=3]	0_a	.	.	.	.	.	.
[HiggestStandard=1]	-3.271	.2040	1	**.000**	257.192	-3.671	-2.871
[HiggestStandard=2]	-1.931	.0921	1	**.000**	439.653	-2.112	-1.751
[HiggestStandard=3]	0_a	.	.	.	.	.	.
No.ofChildren	.210	.0237	1	**.000**	78.477	.164	.257
(Scale)	1_b						

Dependent variable: Are you employed?

Table 4.3.1c gives the results of goodness of fits test. Goodness of fit test was used to measure how well a statistical model fits into a set of observations.

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The measure was done using maximum likelihood estimates which were obtained by finding values that maximised the log-likelihood. The measure done by a likelihood ratio statistic is called "Deviance". Large values of Deviance imply a poor fit for the model. Pearson Chi-Squared test was also used to test for adequacy of the current model. Large values for χ^2 and very small p-values indicate that the model fits poorly. The AIC (Akaike's Information Criterion) and deviance statistic were employed as a criteria for judging the quality of the model. The results from Table 4.3.1c show that the model is well-fitted.

Table 4.3.1c Goodness of fit[a]

	Value	Df	Value/df
Deviance	2088.947	1612	1.296
Scaled Deviance	2088.947	1612	
Pearson Chi-Square	2293.287	1612	1.423
Scaled Pearson Chi-Square	2293.287	1612	
Log Likelihood[b]	-1408.682		
Akaike's Information criterion (AIC)	2833.364		
Finite Sample corrected AIC (AICC)	2833.396		
Bayesian Criterion	2884.835		
Consistent AIC (CAIC)	2892.835		

Dependent Variable: Are you emplyed?

Model: (Intercept), District, maritalStatus, FamilyBackground, HiggestStandard, No.ofChildren

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

Tests of Model Effects

Agresti states that statistical inference based on the Wald test is simplest but the likelihood ratio Chi-Squared is more trustworthy. Both of these tests were employed for significance testing in this study. The results from Table 4.3.1d indicate that all the variables marital status, district, education level, age and the number of children a woman has, resulted in a significant change (p-value=0.000) therefore, suggesting that the inclusion of these variables improved the fit of the model with the intercept-only effect. Family background with (p-value=0.087) is however less significant, therefore

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suggesting that the inclusion of this variable did improve the fit of the simpler model but marginally.

Table 4.3.1d: Tests of Model Effects

Source	Type III		
	Wald Chi-Square	Df	Prob
(Intercept)	234.242	1	.000
District	75.828	1	.000
maritalStatus	56.892	1	.000
FamilyBackground	4.891	2	.087
HiggestStandard	553.094	2	.000
No.ofChildren	76.274	1	.000

4.3.2 Multiple Logistic (Multinomial) Regression Model

The following analysis from multiple logistic regression seeks to further affirm or not the results already obtained from generalized linear modeling.

Table 4.3.2a presents the results of the goodness of fit test.

Table 4.3.2a Goodness-of-Fit

	Chi-Square	Df	Prob
Pearson	2128.150	1611	.000
Deviance	2021.801	1611	.000

We observed in the Goodness of fit tables, (Table 4.3.2a, Table 4.3.2b and Table A3 (in appendix)) that the overall regression is significant as shown by the p-value of .000. That is all the independent variables are collectively significant when we compare the fitted model against the intercept-only model. However we need to test whether all the variables are relevant in the model.

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Table 4.3.2b : Model Fitting Information

Model	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC	BIC	-2 Log Likelihood	Chi-Square	df	Prob
Intercept Only	3973.839	3980.272	3971.839			
Final	2768.218	2826.123	2750.218	1221.620	8	.000

Table 4.3.2c of parameter confirms that all the independent variables are relevant in the model, having p-value = .000. For district odd ratio is -.262, for marital status the odd ratio is .243, for family background the odd ratio is2.963 and for the highest standard passed the odd ratio is -.858. All these figures support the findings in the Table.

Table 4.3.2c : Parameter Estimates

Parameter	B	Std Error	Hypothesis Test		Z	95% Wald Confidence Interval	
			Df	Prob		Lower	Upper
(Intercept)	1.415						
[District=1]	-.262	.030	1	.000	-8.821	-.321	-.110
[District=2]	0_a	.	.	.	.	.	.
[maritalStatus=1]	.243	.030	1	.000	8.178	.185	.465
[maritalStatus=2]	0_a	.	.	.	.	.	.
[FamilyBackground=1]	2.963	.094	1	.000	31.653	2.780	3.680
[FamilyBackground=2]	2.889	.094	1	.000	30.803	2.705	3.797
[FamilyBackground=3]	0_a	.	.	.	.	.	.
[HiggestStandard=1]	-.858	.061	1	.000	-14.001	-.978	-.711
[HiggestStandard=2]	1.314	.038	1	.000	34.884	1.240	1.751
[HiggestStandard=3]	0_a	.	.	.	.	.	.
(Scale)	1_b						

Dependent variable: Are you employed?

The following figures (Fig 4.1 of Adjusted Residuals, Fig 4.2 of Deviance Residuals, Fig 4.3 of Normal Q-Q Plot of Adjusted Residuals and Fig 4.4 of Detrended Normal Q-Q Plot of Adjusted Residuals), all give diagnostic analysis confirming that the model(s) is fairly good.

Fig 4.3 and Fig 4.4 however prove that there are very few outliers.

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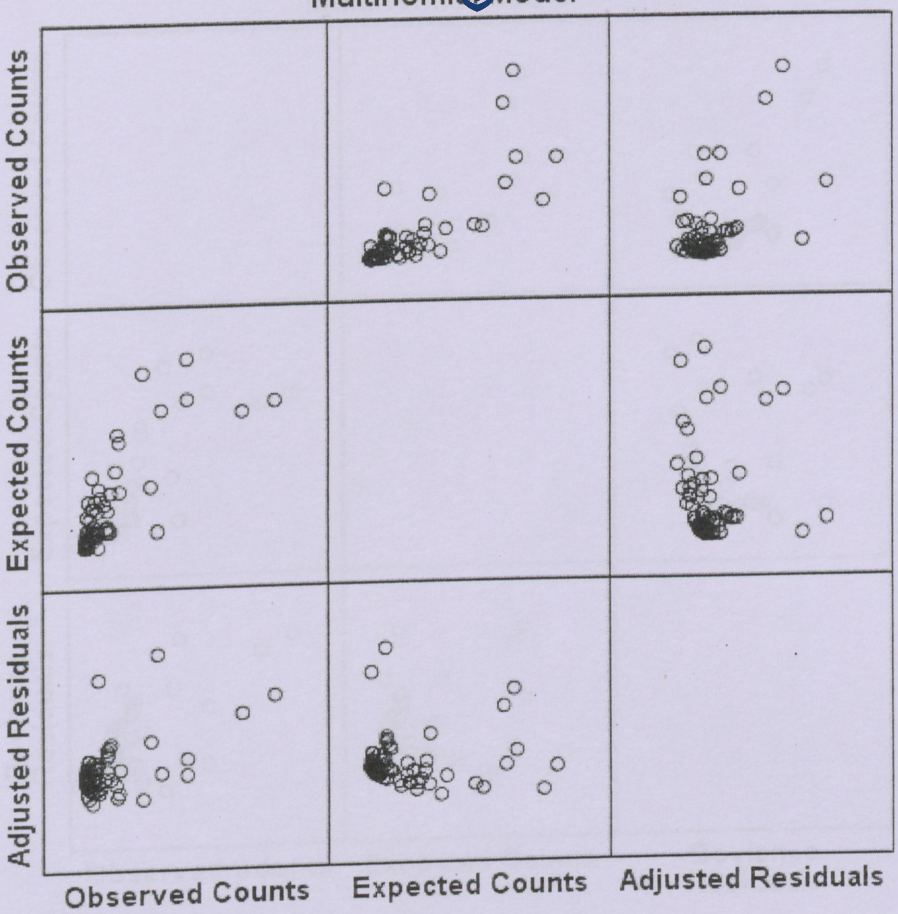


Fig. 4.1: Adjusted Residual

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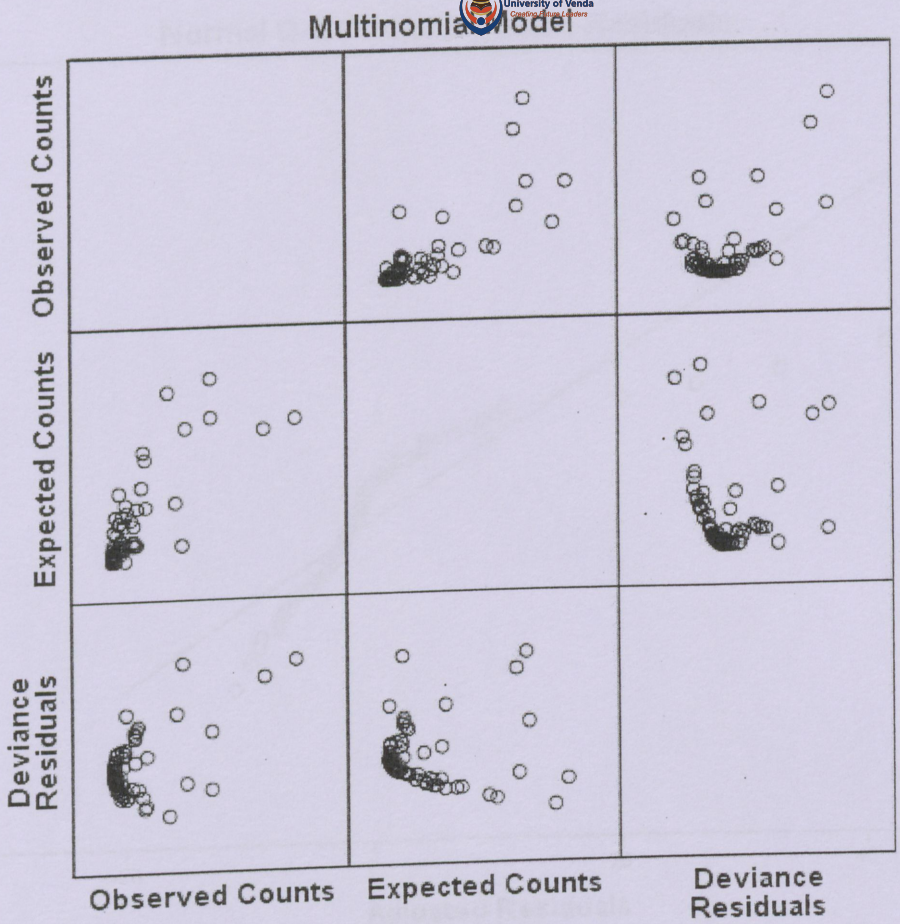


Fig. 4.2: Deviance Residuals

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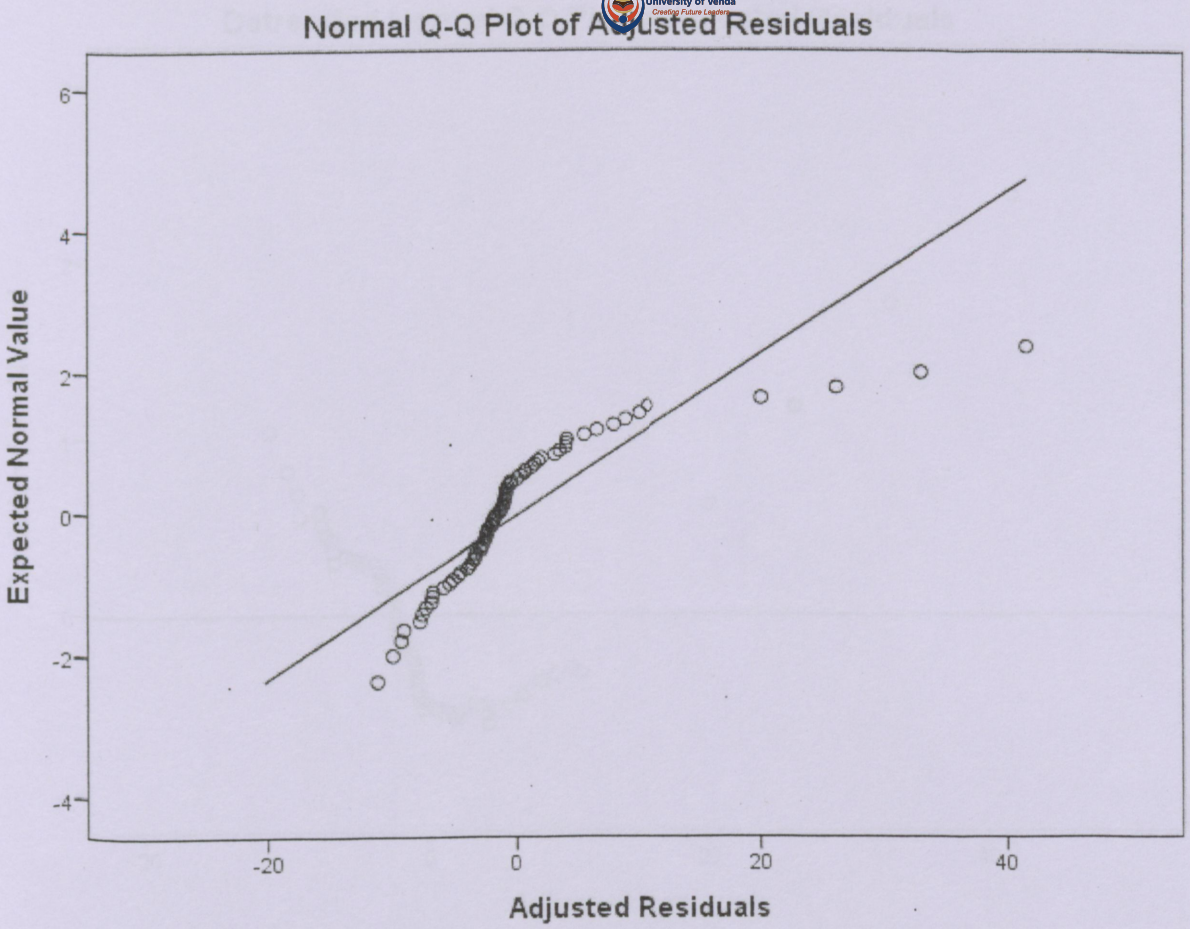


Fig 4.3: Normal Q-Q Plot of Adjusted Residuals

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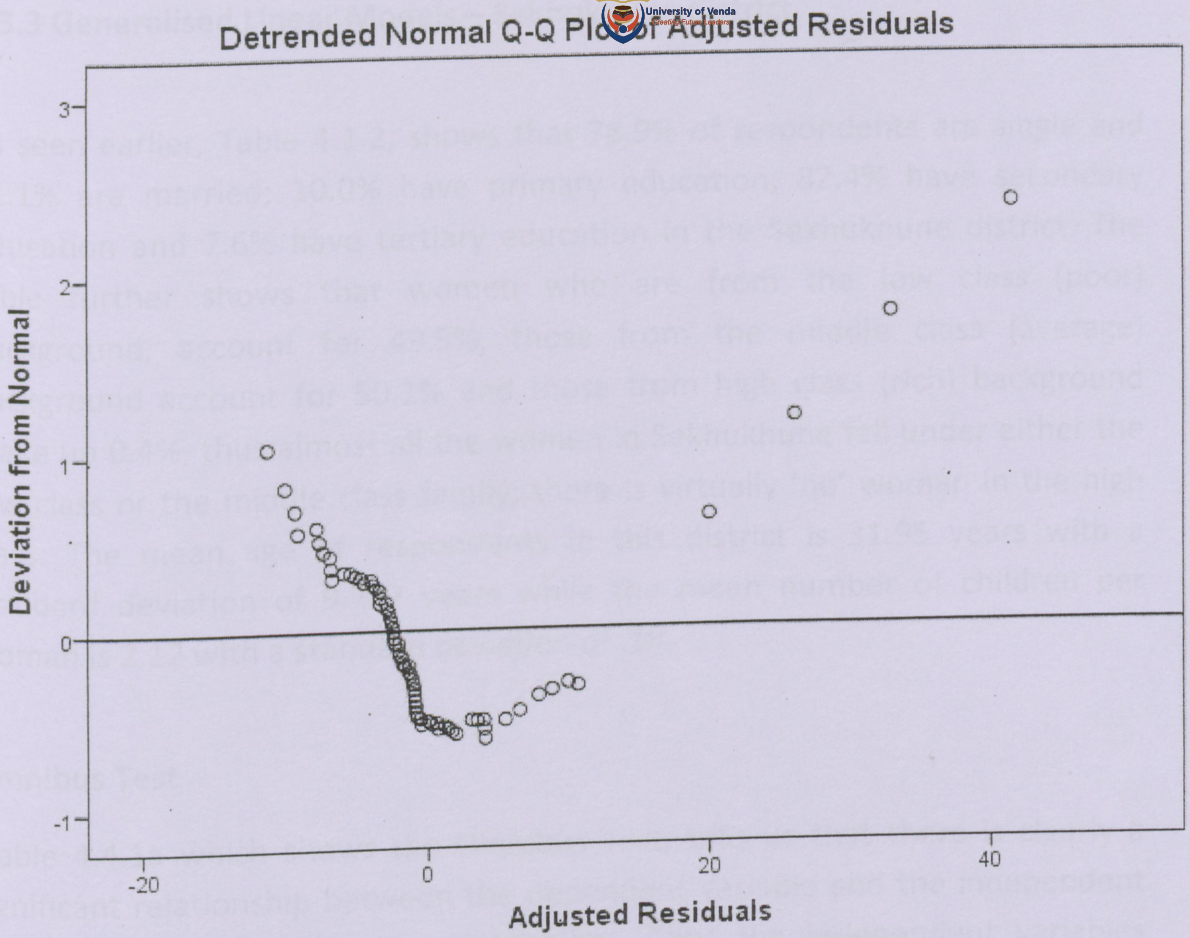


Fig 4.4: Detrended Q-Q Plot of Adjusted Residuals

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4.3.3 Generalised Linear Models – Sekhukhune district

As seen earlier, Table 4.1.2, shows that 78.9% of respondents are single and 21.1% are married; 10.0% have primary education, 82.4% have secondary education and 7.6% have tertiary education in the Sekhukhune district. The table further shows that women who are from the low class (poor) background, account for 49.5%, those from the middle class (average) background account for 50.1% and those from high class (rich) background make up 0.4%, thus almost all the women in Sekhukhune fall under either the low class or the middle class family; there is virtually 'no' woman in the high class. The mean age of respondents in this district is 31.95 years with a standard deviation of 9.737 years while the mean number of children per woman is 2.12 with a standard deviation of .19.

Omnibus Test

Table 4.4.1a which shows the Omnibus Test, tells us that there is clearly a significant relationship between the dependent variable and the independent variables collectively considered together. Thus the independent variables have collectively improved the model compared with the intercept-only model.

Table 4.4.1a Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Prob
263.213	7	.000

Dependent Variable: Are you emplyed?

Model: (Intercept), maritalStatus, HiggestStandard, FamilyBackground, Age, No.ofChildren

a. Compares the fitted model against the intercept-only model.

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The dependent variable is employment and the independent variables are the same as seen in the case of the combined data, viz; marital status (1=single, 2=married), education level (1=primary, 2=secondary, 3=tertiary), family background (1=low class, 2=middle class, 3=high class), age and number of children. The link function identified as the log link function, used to describe the nature of the relationship of the random component and each determinant, yields a GLM of the form expressed in equation 2 below.

The following model is derived from Table 4.4.1b of the parameter estimates:

$$\log_M = -.260 - .289\text{Maritalstatus}_1 - 2.815\text{Familybackground}_1 - 1.663\text{Familybackground}_2 - 2.926\text{Educationallevel}_1 - 1.602\text{Educationallevel}_2 + 0.072\text{age} \quad (2)$$

Equation (2) tells us that in Sekhukhune also, the logarithm of employment (employed) is negatively related to marital status (single), education level (primary,1 and high,2), family background (low class, 1 and middle class, 2) and the number of children that the woman has, but positively related to age.

This interprets that employment level is equally lower for women who are single (compared to married), women with low education level (primary and high school graduates)(compared to those with tertiary education); and for women in low and middle class family background (compared to those from high class background). Employment level however increases with age but decreases with increasing number of children that a woman has. Furthermore, when we compare employment level with primary and high school graduates, we see that the level is much lower for primary than for high school graduates, which means that women with only primary school certificates are most likely to be unemployed. Though employment level decreases with family background at both low and middle classes family background (compared to those from high class background), yet there are differences between the two classes. Women from the middle class family background have a better chance at finding jobs than those from the low class family background.

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Table 4.4.1b Parameter Estimates – Sekhukhune district

Parameter	B	Std Error	Hypothesis Test		Wald Chi-Square	95% Wald Confidence Interval	
			Df	Prob		Lower	Upper
(Intercept)	-.260	.9075	1	.775	.082	-2.039	1.519
[maritalStatus=1]	-.289	.1610	1	.072	3.228	-.605	.026
[maritalStatus=2]	0_a	.	.	.	.	.	.
[FamilyBackground=1]	-2.815	.8805	1	.001	10.228	-4.540	-1.090
[FamilyBackground=2]	-1.663	.8722	1	.056	3.637	-3.373	.046
[FamilyBackground=3]	0_a	.	.	.	.	.	.
[HiggestStandard=1]	-2.926	.3442	1	.000	72.247	-3.600	-2.251
[HiggestStandard=2]	-1.602	.1936	.1	.000	68.499	-1.982	-1.223
[HiggestStandard=3]	0_a	.	.	.	.	.	.
Age	.072	.0103	1	.000	48.361	.051	.092
No.ofChildren	-.035	.0450	1	.435	.609	-.123	.053
(Scale)	1_b						

Dependent variable: Are you employed?

Model: (Intercept), maritalStatus, FamilyBackground, HiggestStandard, Age, No.ofChildren

Goodness of fits

Table 4.4.1c gives the goodness of fit for the model. The results show that the log-likelihood is -478.278, the deviance is 741.271, the Pearson Chi-square is 969.862 and the AIC is 972.556. All these indicators attest that the model fit is good.

Table 4.4.1c Goodness of fit[a]

	Value	Df	Value/df
Deviance	741.271	649	1.142
Scaled Deviance	741.271	649	
Pearson Chi-Square	969.862	649	1.494
Scaled Pearson Chi-Square		1990	
Log Likelihood[b]	-478.278		
Akaike's Information criterion (AIC)	972.556		
Finite Sample corrected AIC (AICC)	972.628		
Bayesian Criterion	1017.363		
Consistent AIC (CAIC)	1025.363		

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Tests of Model Effects

Wald test and likelihood ratio Chi-Squared tests used for significance testing in this study indicate in Table 4.4.1d that all the following variables (i.e. education level, family background, and age) have a very strong relationship with the dependent variable, employment (p-value=.000); therefore suggesting that the inclusion of these variables improved the fit of the model compared with the intercept-only effect in the Sekhukhune district too. The relationship between dependent and marital status is significant only at 10%, p-value =.072. The number of children a woman has does not have a significant relationship with the dependent variable in Sekhukhune, p-value= .435.

Table 4.4.1d: Tests of Model Effects

Source	Type III		
	Wald Chi-Square	Df	Sig.
(Intercept)	61.305	1	.000
Marital status	3.228	1	.072
Education level	92.588	2	**.000**
Family background	60.708	2	**.000**
Age	48.361	1	**.000**
Number of Children	.609	1	.435

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4.3.4 Results for Capricorn district (GLM)

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Again referring to Table 4.1.2 above, we see that 38.5% of the respondents are single, 6.9% of the women have primary education, 64.6% have secondary education and a high proportion of 28.5% have tertiary education in the Capricorn district. The table further indicates that 51.3% of the women are from the low class, 44.4% are from the middle class and 4.3% are from the high class. The mean age is 33.89 years with a standard deviation of 8.093 years, while the mean number of children a woman has is 2.23 with a standard deviation of 1.452.

Omnibus Test

In Capricorn too, the Omnibus Test (in Table 4.4.2a), tells us that there is clearly a significant relationship between the dependent variable and the independent variables collectively considered together. Again, the independent variables have collectively improved the model compared with the intercept-only model.

Table 4.4.2a Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Prob
688.492	7	.000

Dependent Variable: Are you emplyed?

Model: (Intercept), maritalStatus, HiggestStandard, FamilyBackground, Age, No.ofChildren

a. Compares the fitted model against the intercept-only model.

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Table 4.4.2b Parameter Estimates – Capricorn District

Parameter	B	Std Error	Hypothesis Test		Wald Chi-Square	95% Wald Confidence Interval	
			Df	Prob		Lower	Upper
(Intercept)	-.789	.3187	1	.013	6.131	-1.414	-.165
[maritalStatus=1]	-.583	.1031	1	.000	32.058	-.785	-.381
[maritalStatus=2]	0_a	.	.	.	.	.	.
[FamilyBackground=1]	.741	.2385	1	.002	9.654	.274	1.209
[FamilyBackground=2]	.379	.2344	1	.106	2.610	-.081	.838
[FamilyBackground=3]	0_a	.	.	.	.	.	.
[HiggestStandard=1]	-3.705	.2727	1	.000	184.630	-4.240	-3.171
[HiggestStandard=2]	-2.174	.1116	1	.000	379.600	-2.393	-1.956
[HiggestStandard=3]	0_a	.	.	.	.	.	.
Age	.036	.0071	1	.000	26.150	.022	.050
No.ofChildren	.171	.0387	1	.000	19.427	.095	.247
(Scale)	1_b						

Dependent variable: Are you employed?

Model: (Intercept), maritalStatus, FamilyBackground, HiggestStandard, Age, No.ofChildren

The following model is derived from Table 4.4.2b of the parameter estimates:

$\log_M$= -.789 - .583Maritalstatus$_1$ +.741Familybackground$_1$ +.379Familybackground$_2$ - 3.705Educationallevel$_1$ - 2.174Educationallevel$_2$ + .036Age + .171Numberchn --- 3

Equation (3) tells us that in Capricorn too, the logarithm of employment (employed) is negatively related to marital status (single) and education level (primary,1 and high,2), but positively related to family background (low class, 1 and middle class, 2), age and the number of children that the woman has.

Thus the employment level is lower for women who are single (compared to married) and women with low educational level (primary and high school graduates); but higher for women in the low class and the middle class family background (compared to those from the high class background). Employment level equally increases with age as well as the number of children a woman has. Furthermore, when we compare employment level with primary and high school graduates, we see that the level is much lower for primary than for high school graduates, which means that women with only primary school certificates are mostly at risk of finding jobs. The employment level with the

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low class family background is comparatively higher than those in the middle class family background. Thus women from the middle class family background have poorer chance at finding jobs than those from the low class family background in Capricorn.

Table 4.4.2c: Goodness of fit[a]

	Value	Df	Value/df
Deviance	1185.816	955	1.254
Scaled deviance	1185.816	955	
Pearson Shi-Square	1137.200	955	1.191
Scaled Pearson Chi-Square	1137.200	955	
Log Likelihood[b]	-849.474		
Akaike's Information	1714.948		
Criterion(AIC)	1715.003		
Finite Sample Corrected	1761.854		
AIC(AICC)	1769.854		
Bayesian Information Criterion			
Consistent AIC (CAIC)			

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

The AIC (Akaike's Information Criterion) and deviance statistics were employed as a criteria for judging the quality of the model. The results from Table 4.2.3c show that the model fit is good, p-value = .000.

Table 4.4.3 Tests of Model Effects

Source	Type III		
	Wald Chi-Square	Df	Prob
(Intercept)	108.834	1	.000
Marital status	32.058	1	.000
Education level	445.557	2	.000
Family background	18.005	2	.000
Age	26.150	1	.000
Number of Children	19.427	1	.000

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4.4 Results from Discriminant Analysis

4.4.1. The results from discriminant analysis Combined data (Sekhukhune and Capricorn districts)

From Table 4.5.1.1, the mean differences between age (35.37 & 32.10) and education level (3.56 & 2.98) are significant, implying that these independent variables are good discriminators because the separations are large. **[See appendixes for more results on GLM and Discriminant analyses.]**

Table 4.5.1.1 Group Statistics

Are you employed?	Mean	Std. Deviation	Valid N (listwise)	
			Weighted	Unweighted
Yes: Marital status	2.23	1.243	1331	1331.000
Age	35.37	7.588	1331	1331.000
Number of children	2.52	1.497	1331	1331.000
Family background	1.62	0.571	1331	1331.000
Education level	3.56	1.040	1331	1331.000
No: Marital status	1.73	1.184	3269	3269.000
Age	32.10	9.211	3269	3269.000
Number of children	2.05	1.809	3269	3269.000
Family background	1.48	0.535	3269	3269.000
Education level	2.98	1.125	3269	3269.000
Total: Marital status	1.87	1.222	4600	4600.000
Age	33.05	8.896	4600	4600.000
Number of children	2.18	1.738	4600	4600.000
Family background	1.52	0.549	4600	4600.000
Education level	3.15	1.131	4600	4600.000

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Table 4.5.1.2 shows strong statistical evidence of significant differences between employed and unemployed for all independent variables with education level (F=255.156), marital status (F=162.043) and age (131.868) producing high values of F's.

Table 4.5.1.2 Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Prob
Marital status	.966	162.043	1	4598	.000
Age	.972	131.868	1	4598	.000
Number of children	.985	70.911	1	4598	.000
Family background	.987	59.433	1	4598	.000
Education level	.947	255.156	1	4598	.000

The Pooled Within-Group Matrices from Table A6 in the appendix supports the use of these independent variables because the inter-correlations are low.

In discriminant analysis, the basic assumption is that the variances-covariance matrices are equal. With Box's M tests, the null hypothesis states that the covariance matrices do not differ between groups formed by the dependent. For this assumption to be satisfied, the log determinants should be equal. From Table 4.5.1.3 the log determinants appear almost equal.

Box's Test of Equality of Covariance Matrices

Table 4.5.1.3 Log Determinants

Are you employed?	Rank	Log Determinant
Yes	6	2.142
No	6	2.274
Pooled within-groups	6	2.314

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From Table 4.5.1.4, Wilks' Lambda indicates the significance of the discriminant function, a highly significant function (p>0.000) and provides the proportion of the total variability unexplained is 81.8%.

Table 4.5.1.4 Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Prob
1	.818	923.207	6	.000

Table 4.5.1.5 provides an index of the importance of each predictor. The sign indicates the direction of the association. Age (0.222) and education level (0.324) were the strongest predictors. These two variables with fairly large coefficients stand out as those that strongly predict the classification of "employed" or "unemployed". Marital status, the number of children a woman has (0.126) and family backgrounds (0.112) were less successful predictors.

Table 4.5.1.5 Standardised canonical

Discriminant Function Coefficients

	Function
	1
Marital status	.147
Age	.222
The number of children a woman has	.126
Family background	.112
Education level	.324

Variables ordered by absolute size of correlation within function.

The discriminant function coefficients show slight contribution of each variable to the discriminant function controlling for all other variables in the equation. They can be used to examine each independent variable's unique

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contribution to the discriminant function and therefore, provide information on the relative importance of each variable. The form of the equation is:

D= 0.324education level + 0.222age + 0.147marital status + 0.126number of children + 0.112family background

From Table A7.1 in the appendix, each group is described in terms of its profile using the group means of the predictor variables and these group means are called centroids. The mean of the employed is 0.739 and the mean of the unemployed is -0.301.

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4.4.2 Discriminant analysis for Sekhukhune District

As can be seen in Tables 4.5.2.1a & Table 4.5.2.1b, the Group Statistics and Tests of Equality of Group here also show that the mean difference between age (35.69 & 31.31) and the number of children a woman has (2.53 & 2.06) are significant. These results show that these independent variables are good discriminators because the separations are fairly large. The more children a woman has, the lesser the chance of her seeking for a job. The less children a woman has, the greater the chance of her seeking for a job because she can take the children to their grandparents or relatives (family members) so that she can go out and search for a job.

Table 4.5.2.1 shows strong statistical evidence of significant differences between employed and unemployed for all independent variables with age (F= 52,373), education level (F=87.494) and family background (F=104.086), producing high values of F's.

Table 4.5.2.1a Group Statistics

Are you employed?	Mean	Std. Deviation	Valid N (listwise)	
			Unweighted	Weighted
Yes Age	35.69	7.741	295	295.000
Marital status	1.36	.480	295	295.000
Education level	2.18	.509	295	295.000
A number of children	2.53	1.751	295	295.000
Family background	1.78	.447	295	295.000
No Age	31.31	9.902	1705	1705.000
Marital status	1.19	.389	1705	1705.000
Education level	1.94	.360	1705	1705.000
A number of children	2.06	2.089	1705	1705.000
Family background	1.46	.502	1705	1705.000
Total Age	31.95	9.737	2000	2000.000
Marital status	1.21	.408	2000	2000.000
Education level	1.98	.420	2000	2000.000
A number of children	2.12	2.049	2000	2000.000
Family background	1.51	.507	2000	2000.000

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Table 4.5.2.1b Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Prob
Age	.974	52.373	1	1998	.000
Marital status	.978	44.591	1	1998	.000
Education level	.958	87.494	1	1998	.000
Number of children	.993	13.328	1	1998	.000
Family background	.950	104.086	1	1998	.000

Table A8.1 in the appendix of the Pooled Within-Group Matrices supports the use of these independent variables because the inter-correlations are low.

Table 4.5.2.2 Log Determinants

Are you employed?	Rank	Log Determinants
Yes	4	-.526
No	4	-1.007
Pooled within-groups	4	-.853

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

A canonical correlation from Table A8.1 in the appendix, is 0.367 which suggests that the model has explained only 13.4% of the variation in the grouping variable (employed or unemployed).

From Table 4.5.2.3 Wilks' Lambda indicated the significance of the discriminant, a highly significant function ($p>0.000$) and provide the proportion of the total variability unexplained which is 86.6%.

Table 4.5.2.3 Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi- square	Df	Prob
1	.866	288.195	4	.000

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Table 4.5.2.4 shows an index of the importance of each predictor. Education level (0.734), age (0.654) and family background (0.490) were the strongest predictors. Marital status (0.153) was a less successful predictor.

Table 4.5.2.4 Standardised Canonical Discriminant Function Coefficients

	Function
	1
Age	.654
Marital status	.153
Education level	.734
Family background	.490

The discriminant function coefficients show a slight contribution of each variable to the discriminant function controlling for all other variables in the equation. The form of equation is

D= 0.734Educationlevel + 0.654Age + 0.490familybackground + 0.153Maritalstatus

From Table 4.5.2.5, each group is described in terms of its profile using centroids of the predictor variables. The mean of the employed is 0.947 and that of the unemployed is -0.164.

Table 4.5.2.5 Functions at Group Centroids

Are you employed?	Functions
	1
Yes	.947
No	-.164

As many of the Tables in this stepwise discriminant analysis are the same as those for the basic analysis, we therefore interpret only extra stepwise statistics tables obtained. From Table 4.5.2.6, the stepwise statistics shows that four steps were taken. Each step included a different variable. These four

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steps were included in the variables in the analysis and Wilks' Lambda table because each was adding some predictive power to the function.

Table 4.5.2.6 Variables in the Analysis

Step	Tolerance	F to Remove	Wilks' Lambda
1 Family background	1.000	104.086	
2 Family background	.981	77.339	.958
Education level	.981	60.966	.950
3 Family background	.980	68.519	.898
Education level	.831	131.622	.925
Age	.846	125.388	.922
4 Family background	.974	64.710	.894
Education level	.828	127.203	.921
Age	.710	84.931	.902
Marital status	.826	5.203	.868

From Table A8.3, in the appendix, all the predictors add some predictive power to the discriminant function as all are significant with $p<0.000$; and 73.4% of the original grouped cases were correctly classified.

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4.4.3 Discriminant Analysis for Capricorn district

From Table 4.5.3.1a, the mean differences between age (33.28 & 32.96) and the number of children a woman has (2.52 & 2.04) indicate that these independent variables are good discriminators because the separations are fairly large.

Table 4.5.3.1a Group Statistics

Are you employed?	Mean	Std. Deviation	Valid N (listwise)	
			Unweighted	Weighted
Yes Age	35.28	7.545	1036	1036.000
Marital status	1.72	.450	1036	1036.000
Education level	2.50	.534	1036	1036.000
Family background	1.57	.594	1036	1036.000
Number of children	2.52	1.418	1036	1036.000
No Age	32.96	8.311	1564	1564.000
Marital status	1.55	.498	1564	1564.000
Education level	2.02	.480	1564	1564.000
Family background	1.50	.568	1564	1564.000
Number of children	2.04	1.444	1564	1564.000
Total Age	33.89	8.093	2600	2600.000
Marital status	1.62	.487	2600	2600.000
Education level	2.22	.554	2600	2600.000
Family background	1.53	.580	2600	2600.000
Number of children	2.23	1.452	2600	2600.000

Table 4.5.3.1b identifies a strong statistical evidence of significant differences between the employed and the unemployed for all independent variables with education level (F=569.249), marital status (F= 79.119) and the number of children (F=69.876) producing high values of F's.

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Table 4.5.3.1b Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Prob
Age	.980	52.260	1	2598	.000
Marital status	.970	79.119	1	2598	.000
Education level	.820	569.249	1	2598	.000
Family background	.997	8.905	1	2598	.003
Number of children	.974	69.876	1	2598	.000

Table A8.4 in the appendix supports the use of the independent variables because the inter-correlations are low.

From Table 4.5.3.2, the log determinants appear almost equal which implies that the basic assumption of the discriminant analysis is satisfied. From Table 4.4.3.4, the Box's M is 433.558, F is approximately 15.438 and the level of significance is $p<0.000$. The log determinants of the combined data also appear almost equal, but the log determinants of the Sekhukhune district appear different. This implies that the null hypothesis for Sekhukhune district does not hold (it is rejected).

Table 4.5.3.2 Log Determinants

Are you employed?	Rank	Log determinant
Yes	7	-5.028
No	7	-5.820
Pooled within-groups	7	-5.337

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

A canonical correlation is 0.563 from Table 4.5.3.3, which suggests that the model has explained 31.7% of the variation in the grouping variable.

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Summary of canonical discriminant functions

Table 4.5.3.3 Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical correlation
1	.464[a]	100.0	100.0	.563

a. First 1 canonical discriminant functions were used in the analysis.

From Table 4.5.3.4, Wilks' Lambda indicates the significance of the discriminant function which is $p<0.000$ and provides the proportion of the total variability unexplained which is 68.3%.

Table 4.5.3.4 Wilks' Lambda

Tests of Function(S)	Wilks' Lambda	Chi-square	df	Prob
1	.683	988.901	7	.000

Table 4.5.3.5 shows an index of the importance of each predictor. Education level (0.687) and age (0.247) were strongest predictors. Family background (-0.134) and the number of children a woman has (0.151) were less successful predictors. Education level and age were also strongest predictors from the combined data. Education level and family background were strongest predictors from Sekhukhune district. Education level and age seem to be more predictive factors because they are common in both districts. Family background is only a predictive factor in Sekhukhune district.

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Table 4.5.3.5 Standardised Canonical Discriminant Function Coefficients

	Function
	1
Age	.247
Marital status	.232
Education level	.687
Family background	-.134
Number of children	.151

The discriminant function coefficients show slight contribution of each variable to the discriminant function controlling for all other variables in the equation. The form of the equation is

D= 0.687Educationlevel + 0.247Age + 0.232Maritalstatus + 0.151numberofchildren – 0.134familybackground

From Table A8.5 in the appendix, the mean of the employed is 0.837 and the mean of the unemployed is -0.554. In the cross validation, each case is classified by the functions derived from all cases other than that case; 76.7% of cross-validated grouped cases correctly classified.

4.4.4 Summary from Discriminant Analysis

Discriminant analysis was conducted to predict whether a respondent was employed or unemployed. Predictor variables were age, marital status, family background, a number of children a woman has, education level and job comfort. Significant mean differences were observed for all the predictors on the dependent variable. The log determinants were different. Box's M indicated that the assumption of equality of covariance matrices was not violated. The discriminant function revealed that a significant association between groups and all predictors accounting for 13.4% of differences between group variability. The analysis of the standardised canonical, see appendixes revealed three significant predictors which are family background (0.490), age (0.654) and education level (0.734) with poor predictor which is,

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marital status (0.153). The cross validated classification showed that overall 73.4% were correctly classified.

High values of F's from Sekhukhune districts are: Family background (F=104.086), education level (87.494) and age (F=52.373) and that of the combined data are: education level (255.156) and age (131.868). These results suggest that education level is the most predictive factor because it is common; it has influence in the individual districts and also in the combined districts. Age as a predictive factor from Sekhukhune district has more influence on the combined data. Family background is only a predictive factor in Sekhukhune district. Number of children is a predictive factor only in Capricorn district.

Age has an impact on women's unemployment because younger women are more able to afford unpaid job-search since they have fewer financial commitments than older women do. According to Kryger (1999) the probability of being unemployed decreases with the age initially but then increases after 40 years as the woman becomes older.

4.5 DISCUSSION (Combined data)

We see from Table 4.1.2 above that while 85% of the women in Sekhukhune are unemployed, less than 60% of the women in Capricorn are unemployed. Though the unemployment rate is high for the two districts, the rate of 85% in Sekhukhune is extremely high.

4.5.1 District

From the hierarchical loglinear analysis in Table 4.2.2, we see that there is an interaction between employment and district; employment and marital status; employment and education level; district and marital status; and, district and education level. Because hierarchical analysis could not show relationship between dependent and independent variables, we then use generalized linear models, logit model, to determine such relationship. The Table 4.2.3b from the GLM analysis as well as equation 1 above shows that there is a significant difference in the employment level between the two districts. When Capricorn is taken as a base for comparison, the odd ratio for getting a job in Sekhukhune

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is .456. Thus the level of employment in Sekhukhune is reduced by 54% ($e^{-.785}$), and this already supports the observation in Table 4.1.2 that unemployment level is higher in Sekhukhune.

This observation raises a point that employment opportunities are not the same for the districts, and in fact, the level of employment is higher in Capricorn which is more urbanised district. Thus from this analysis, keeping all other things constant, unemployment is higher in more rural Sekhukhune than in Capricorn.

4.5.2 Education level

Concerning the level of education, the respondents with primary education were 8.2%, with secondary education 72.3% and those with tertiary education 19.4% from the combined data; while the proportion with primary education in Sekhukhune is about 10.0%, those with secondary education is 82.4% and those with tertiary education is 7.6%. The proportion of respondents with primary education is 6.9%, those with secondary education are 64.6% and for those with tertiary education is 28.5% from the Capricorn district. This proportion of women with tertiary education in Capricorn is about four times that of Sekhukhune, which implies that women in Capricorn can access job almost four times more than women from Sekhukhune. This could explain the fact that the proportion of women employed in Capricorn is almost three times that of Sekhukhune; and this could support the fact that education, especially higher education promotes higher opportunity of being employed (Hertz and Marshall, 2001; Handy et al., 2006).

Again from Table 4.2.3b, we see that if tertiary education level is taken as the base for comparison, the odd ratio for getting a job is .145 for high school graduates, and .038 for primary school graduates. The level of employment is reduced by almost 85% (i.e. $e^{-1.931}$) for high school graduates and only equals to 3.8% (i.e. $e^{-3.271}$) for primary school graduates. It is on record that employment status is usually determined by the education level hence women with high education level can access employment more easily than those with low education level. In other words, the more education a woman possesses, the less the chance that she will be unemployed (USBLS, 2006; Kyei and Maboko,

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2015). A study by U.S Bureau of Labour Statistics in 2006 revealed that about 76% of the graduates with less than a high school diploma were unemployed, but only 2.3% of college graduates were unemployed.

4.5.3 Marriage

As far as marriage is concerned, again there is a big contrast. Whereas 78.9% of women in Sekhukhune are single; only 38.5% (less than a half) of the women in Capricorn are single. Studies have shown that single women are more likely to be unemployed than married women therefore in terms of marital status too, women in Capricorn stand a better chance of getting jobs (Kyei and Maboko, 2015). From the same Table 4.2.3b, if married is taken as the base for comparison, the odd ratio for getting a job is .534 for single women. The employment level for single women is decreased by 47% (i.e. $e^{-.628}$) in Sekhukhune, which agrees with the information in Table 4.1.2.

The study carried out by the Urban Institute shows that the long term unemployment rate for unemployed single parents was 55%, compared to 44% for unemployed married parents. In Sub-Saharan Africa early marriage is common and often seen as a key factor why women fail to access the labour market. Cultural beliefs and norms may keep women out of labour market. In many cultures, there is little or no acceptance of women taking up employment. In many rural areas of Afghanistan for example, women do not have permission to leave their houses and find a job outside (IRIN, 2007). The OECD (Organisation for Economic Co-operation and Development) database on Gender, Institutions and Development confirms this by looking at a broader set of factors related to discrimination against women (OECD, 2008).

4.5.4 Age

The mean age of the women from Capricorn is 33.89 years, while that of Sekhukhune is 31.95 years and that of the combined data (Sekhukhune and Capricorn) is 33.05 years. Close analysis of the age data shows that 6.6% of women from Sekhukhune were aged 20 years compared to only 1.5% of the women at the same age from Capricorn. The proportion of women aged

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between 20 – 24 years in Sekhukhune is 11.7% compared with 12% from Capricorn in the same age bracket. These figures show that though the differences in the age structure are not very much, employment opportunities could still be better in Capricorn than in Sekhukhune in terms of age because Capricorn women are relatively "older". According to a study carried out by Kryger (1999) on unemployment, the probability of being unemployed initially decreases with the age but then increases as the women get older. Other studies affirm that young people find it more difficult to get jobs and this observation can support that assertion (Kryger, 1999; Kyei and Maboko, 2015).

4.5.5 Family background

Table 4.1.2 again shows that the proportion of respondents from the "low class" (poor background) from the combined data is 50.5%, from the middle class (average class) is 46.9% and from high class is 2.6%. For the Sekhukhune district, the proportion is as follows: low class 49.5%, middle class 50.1% and high class is 0.4%; and for the Capricorn district, the low class 51.3%, the middle class 44.4% and the high class of 4.3%. This implies that almost all the women are either from the low class or the middle class since those from the high class is below 5%, is not significant.

4.6.1 Discussion of GLM results - Sekhukhune district

As we saw in the case of the combined districts, employment in Sekhukhune is also negatively related to marital status, education level, family background and age, (see Table 4.3.1b and equation 2). From Table 4.3.1b, we see that if married is taken as the base for comparison, the odd ratio for single (not married women) is .75. Thus employment level decreases by 25% (i.e. $e^{-.289}$) for the single women; if tertiary education level is taken as the base, the odd ratio for high school graduates is .20, and .054 for primary school graduates. The level of employment is reduced by almost 80% (i.e. $e^{-1.602}$) for high school graduates and the level is only equals to 5.4% (i.e. $e^{-2.926}$) for primary school graduates. If high class of family background is taken as a base for comparison, the odd ratio for the middle class is .18, and .06 for low class background. The level of employment is reduced by almost 82% (i.e. $e^{-1.663}$) for the middle class,

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and only equals to 6% for the low class. The level of employment however increases by 7.5% with age.

These figures prove that the level of unemployment of women is high in the Sekhukhune district and possibly because of the very low level of women with tertiary education. The proportion of women who are not married is exceptionally high and that could add to the high rate of unemployment in the district. Over 78.9% of women in Sekhukhune are single; and studies show that single women are more likely to be unemployed than married women (The Urban Institute, 2013; Kyei and Maboko, 2015). It becomes clear from all these indicators that the level of unemployment is very high in this district.

It is on record that employment status is usually determined by the education level hence women with high education level can access employment more easily than those with low education level. In other words, the more education a woman possesses, the less the chance that she will be unemployed. As indicated earlier on, the U.S. study in 2006 revealed that about 76% of those with less than a high school diploma were unemployed, but only 2.3% of college graduates were unable to find a job (US Bureau of Labour Statistics, (USBLS) 2006).

4.6.2 Discussion of GLM results - Capricorn district

Again it can be seen that employment in Capricorn is also negatively related to marital status and the level of education, but positively related to family background and age, (see Table 4.3.2b and equation 3). From Table 4.3.2b, we see that if married is taken as the base for comparison, the odd ratio for single women is .56. The employment level decreases by 44% (i.e. $e^{-.583}$) for the single women. On the other hand, if tertiary education level is taken as the base, the odd ratio for high school graduates is .11, and .025 for primary school graduates. The level of employment is reduced by almost 89% (i.e. $e^{-2.174}$) for high school graduates and is only equals to 2.5% (i.e. $e^{-3.705}$) for primary school graduates. If high class of family background is taken as a base for comparison, the odd ratio for middle class is 1.46, and 2.10 for low class background. The level of employment in this sense increases by almost 46% (i.e. $e^{.379}$) for the

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middle class, and increases more than twice (i.e. $e^{.741}$) for the low class. The level of employment equally increases by 3.7% with age and increases by 19% with the number of children that a woman has.

4.6.3 Summary

Comparing the two districts, we see that the independent variables do not affect employment in the same way. Though the level of employment reduces from married to singlehood for women in both districts, the magnitudes are different. In the same vein, though the level of employment decreases with decreasing level of education from tertiary to primary, again the magnitudes are very different. Furthermore, while employment does not have a significant relationship with the number of children in Sekhukhune; it (employment) has a very strong positive relationship with the number of children in Capricorn. The level of employment has a very strong positive relationship with increasing age in both districts, but again the magnitude is different.

When Capricorn alone is considered, all the variables – education, age, marital status, family status and the number of children - are seen to influence (un)employment very strongly. If married is considered as the base, or tertiary education as base, etc., we get similar observations as above (in the case of the combined).

By contrast when Sekhukhune is taken, only three variable, viz. education, family background and age strongly affect (un)employment. Considering high class as the base for family status, the proportion of job opportunities rather decreases for middle class and that of low class. Thus the influence of family status in Sekhukhune is different from those of Capricorn and the combined data.

The goodness fit holds good for all the three cases proving that the model for each case, is good.

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4.7 Conclusion

The data from both the Sekhukhune and Capricorn districts have been analysed, presented and discussed in detail. We have seen that district, marital status, education and age strongly influence unemployment while the number of children affects it slightly, for the combined data. For Capricorn, all the variables – education, age, marital status, family status and the number of children influence unemployment very strongly (p-value =.000). By contrast only three variable, viz. education, family background and age strongly affect unemployment in Sekhukhune. The number of children does not have any relationship with unemployment while marital status has slight relationship.

The chances of women getting employed in Capricorn is about four times higher than that of women in Sekhukhune when education is considered; and about one and half times when age is a factor. Unemployment is negatively related to marital status such that single women are mostly without jobs. Unemployment is equally negatively related to education such that unemployment is higher for high school graduates and highest for primary school graduates; but positively related to family background, age and the number of children the woman has.

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FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter seeks to present the summary of the findings from the investigation of the factors determining women's unemployment in the Sekhukhune and Capricorn districts in the Limpopo Province. Conclusions are drawn, based on the findings and recommendations are also given to the Sekhukhune and Capricorn districts. This research has identified several factors that affect women's unemployment. The major findings from this study in response to the research question stated earlier in chapter 1 (What is the level of unemployment and what are the factors that contribute to women's unemployment status in the Sekhukhune and Capricorn districts in the Limpopo Province?). The details were presented in the previous chapter (Chapter 4).

5.2 Summaries of major findings

5.2.1 Findings from Sekhukhune and Capricorn districts (combined data)

First, a loglinear analysis was done to find the association among factors. Next GLM was conducted to find the relationship between dependent variable (employment) and the independent variables. And as a further proof to test and affirm the relationship between the dependent and the independent variables, multiple logistic (multinomial) regression was conducted. The multinomial regression analysis was conducted to predict a response (employed or unemployed) from the predictor variables (age, marital status, education level, family background and the number of children a woman has). Model fit tests and diagnostics were conducted to prove the results of the analyses.

A discriminant analysis was conducted to predict whether a respondent was employed or unemployed. Predictor variables were age, marital status, education level, family background and the number of children that a woman has. Significant mean differences were observed for all predictors on the

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dependent variable. The log determinants were similar. Box's M indicated that the assumption of equality of covariance matrices was violated. However, given the large sample, this problem is not regarded as serious. The discriminant function revealed a significant association between groups and all predictors are accounted for 18.2% of differences between group variability. A closer analysis of the standardised canonical function coefficients revealed only two significant predictors which are education level (0.324) and age (0.222). Poor predictors are the number of children a woman has (0.147) and family background (0.112). The cross validated classification showed that the overall 77.6% were correctly classified. This is confirmed by the generalised linear model where the education level and age are highly significant at p=0.000. The number of children that a woman has is significant at p=0.023 while family background is marginally significant only at p=0.071.

5.2.2 Findings from Sekhukhune district

Again, a discriminant analysis was conducted to predict whether a respondent was employed or unemployed. The same predictor variables were used as before. Significant mean differences were observed for all the predictors on the dependent variable. The log determinants were different. Box's M indicated that the assumption of equality of covariance matrices was not violated. The discriminant function revealed that a significant association between groups and all predictors accounting for 13.4% of differences between group variability. The analysis of the standardised canonical, see appendixes revealed three significant predictors which are family background (0.490), age (0.654) and education level (0.734) with poor predictor which is, marital status (0.153). The cross validated classification showed that overall 73.4% were correctly classified. This is also confirmed by generalised linear model where education level, family background and age are highly significant at p=0.000.

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5.2.3 Findings from Capricorn district

Similarly, a discriminant analysis was conducted to predict whether a respondent was employed or unemployed. Predictor variables were age, marital status, family background, and the number of children a woman has, education level. Significant mean differences were observed for all the predictors on the dependent variable. The log determinants were similar. Box's M indicate that the assumption of the equality of covariance matrices was violated. However, given the large sample, this problem is not regarded as serious. The discriminant function revealed a significant association between groups and all predictors accounting for 31.7% of differences between group variability. Standardised canonical analysis revealed three significant predictors which are education level (0.687), and age (0.247) with family background (-0.134) and the number of children a woman has (0.151) as poor predictors. The cross validated classification showed that overall 76.9% were correctly classified. The generalised linear model confirms that all variables: education level, job, family background, age and the number of children are highly significant at p=0.000.

We have seen that the most predictive factors affecting unemployment which have been confirmed by all the techniques are district, education level, marital status and age. Family background and the number of children are less predictive in Sekhukhune. The marital status, education and age strongly influence unemployment while the number of children affects it slightly, for the combined data. For Capricorn, all the variables – education, age, marital status, family status and the number of children influence unemployment very strongly (p-value =.000). By contrast only three variable, viz. education, family background and age strongly affect unemployment in Sekhukhune. The number of children does not have any relationship with unemployment while marital status has slight relationship.

5.3 Conclusion

Employment levels are different in the two districts with Sekhukhune have extremely high level of unemployment at 85%. The factors affecting unemployment are not exactly the same. The number of children has no effect

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on employment or not in Sekhukhune but has effect on employment in Capricorn. Therefore district as a location is a matter of importance in the study of employment.

In conclusion, this study has shown that the most predictive factors which have been confirmed by discriminant analysis are education level, marital status and age. Family background and the number of children a woman has were less predictive. That is both discriminant analysis and generalised linear model confirm that the previous mentioned predictors are the most predictive of all variables considered in the analysis.

5.4 Recommendations

Given the high level of unemployment in Limpopo the study recommends the following:

- Women, especially the young women, must be encouraged to further their studies after high schools (to obtain higher qualifications) because when women are highly educated, they stand a better chance of being employed
- Women should be encouraged not to be involved in polygamy because their husbands will be less attentive.
- Women should be encouraged to do training to capacitate them to get a job
- After secondary level education, women must be encouraged to further their studies (to obtain higher qualifications) because when women are highly educated, they stand a better chance of being employed.

5.5 Future research

Further studies concerning women's unemployment must be done to answer other questions about the factors contributing towards women's unemployment.

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Appendix

Hierarchical Loglinear Analysis

Table A1: K-Way and Higher-Order Effects

	K	Df	Likelihood Ratio		Pearson		Number of Iterations
			Chi-Square	Sig.	Chi-Square	Sig.	
K-way and Higher Order Effects[a]	1	23	6394.561	.000	9170.866	**.000**	0
	2	18	2275.844	.000	3119.314	**.000**	2
	3	9	29.542	.001	31.955	**.000**	6
	4	2	3.051	.217	2.933	.231	3
K-way Effects[b]	1	5	4118.718	.000	6051.552	**.000**	0
	2	9	2246.301	.000	3087.359	**.000**	0
	3	7	26.491	.000	29.023	**.000**	0
	4	2	3.051	.217	2.933	.231	0

a. Tests that k-way and higher order effects are zero.

b. Tests that k-way effects are zero.

Table A2: Partial Associations

Effect	Df	Partial Chi-Square	Sig.	Number of Iterations
Employed*District*maritalStatus	1	.543	.461	5
Employed*District*HiggestStandard	2	3.292	.193	4
Employed*maritalStatus*HiggestStandard	2	8.804	**.012**	3
District*maritalStatus*HiggestStandard	2	11.506	**.003**	4
Employed*District	1	64.524	**.000**	4
Employed*maritalStatus	1	110.523	**.000**	4
District*maritalStatus	1	592.679	**.000**	5
Employed*HiggestStandard	2	596.966	**.000**	5
District*HiggestStandard	2	135.190	**.000**	6
maritalStatus*HiggestStandard	2	33.621	**.000**	5
Employed	1	842.540	**.000**	2
District	1	78.484	**.000**	2
maritalStatus	1	67.368	**.000**	2
HiggestStandard	2	3130.325	**.000**	2

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Table A3 :Cell counts and residuals

Employed	District	Marital status	Level of education	Observed	Expected	Residual
Yes	Sekhukhune	Single	Primary	12.5	12.5	.000
			Secondary	133.5	133.5	.000
			Tertiary	45.5	45.5	.000
		Married	Primary	4.5	4.5	.000
			Secondary	76.5	76.5	.000
			Tertiary	25.5	25.5	.000
	Capricorn	Single	Primary	5.5	5.5	.000
			Secondary	127.5	127.5	.000
			Tertiary	160.5	160.5	.000
		Married	Primary	13.5	13.5	.000
			Secondary	350.5	350.5	.000
			Tertiary	381.5	381.5	.000
No	Sekhukhune	Single	Primary	112.5	112.5	.000
			Secondary	1212.5	1212.5	.000
			Tertiary	64.5	64.5	.000
		Married	Primary	72.5	72.5	.000
			Secondary	226.5	226.5	.000
			Tertiary	19.5	19.5	.000
	Capricorn	Single	Primary	61.5	61.5	.000
			Secondary	558.5	558.5	.000
			Tertiary	89.5	89.5	.000
		Married	Primary	100.5	100.5	.000
			Secondary	645.5	645.5	.000
			Tertiary	111.5	111.5	.000

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* Generalized Linear Models – Logit procedure.

Table A4: Model Fitting Criteria

Effect	Model Fitting Criteria				
	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	Sig.
Intercept	2768.218	2826.123	2750.218[a]	.000	.
Age	2829.030	2880.500	2813.030	62.811	.000
No.ofChildren	2775.056	2826.526	2759.056	8.837	.003
District	2843.768	2895.239	2827.768	77.550	.000
maritalStatus	2798.196	2849.666	2782.196	31.977	.000
HiggestStandard	3415.915	3460.952	3401.915	651.697	.000
FamilyBackground	2769.259	2814.295	2755.259	5.040	.080

Goodness of Fit[a]

	Value	df	Value/df
Deviance	2084.613	1612	1.293
Scaled Deviance	2084.613	1612	
Pearson Chi-Square	2243.346	1612	1.392
Scaled Pearson Chi-Square	2243.346	1612	
Log Likelihood[b]	-1406.515		
Akaike's Information Criterion (AIC)	2829.030		
Finite Sample Corrected AIC (AICC)	2829.061		
Bayesian Information Criterion (BIC)	2880.500		
Consistent AIC (CAIC)	2888.500		

Dependent Variable: Are you emplyed?

Model: (Intercept), District, maritalStatus, FamilyBackground, HiggestStandard, No.ofChildren

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

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Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
1158.809	7	.000

Dependent Variable: Are you emplyed?

Model: (Intercept), District, maritalStatus, FamilyBackground, HiggestStandard, No.ofChildren

a. Compares the fitted model against the intercept-only model.

Table A4.3: Parameter Estimates

Are you emplyed?[a]		B	Std. Error	Wald	Df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Yes	Intercept	-.887	.282	9.925	1	.002			
	Age	.046	.006	62.833	1	.000	1.047	1.035	1.059
	No.ofChildren	.085	.029	8.881	1	.003	1.089	1.030	1.151
	[District=1]	-.776	.089	75.782	1	.000	.460	.387	.548
	[District=2]	0[b]	.	.	0	.	.	.	.
	[maritalStatus=1]	-.483	.086	31.909	1	.000	.617	.522	.729
	[maritalStatus=2]	0[b]	.	.	0	.	.	.	.
	[HiggestStandard=1]	-3.551	.207	293.254	1	.000	.029	.019	.043
	[HiggestStandard=2]	-1.988	.093	453.157	1	.000	.137	.114	.165
	[HiggestStandard=3]	0[b]	.	.	0	.	.	.	.
	[FamilyBackground=1]	.315	.226	1.936	1	.164	1.370	.879	2.134
	[FamilyBackground=2]	.431	.224	3.688	1	.055	1.538	.991	2.387
	[FamilyBackground=3]	0[b]	.	.	0	.	.	.	.

a. The reference category is: no.

b. This parameter is set to zero because it is redundant.

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Table A5: **Pseudo R-Square**

Cox and Snell	.233
Nagelkerke	.333
McFadden	.221

Table A6 The Pooled Within-Groups Matrices[a]

	Marital status	Age	The number of children a woman has
Covariance Marital status	1.443	4.484	.650
Age	4.484	76.957	9.542
Number of children a woman has	.650	9.542	2.974
Family background	-.015	.152	.011
Education level	.125	.623	-.051

	Family background	Education level
Covariance Marital status	-.015	.125
Age	.152	.623
The number of children a woman has	.011	-.051
Family background	.298	.123
Education level	.123	1.212

a. The covariance matrix has 4598 degrees of freedom

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Table A7.1 Functions at Group Centroid

Are you employed?	Function
	1
Yes	.739
No	-.301

Table A7.2 Classification results[a]

Are you employed?		Predicted Group Membership		Total
		Yes	No	
Original Count	Yes	653	678	1331
	No	352	2917	3269
Original %	yes	49.1	50.9	100.0
	No	10.8	89.2	100.0

a. 77.6% of original grouped cases correctly classified.

b. **Table A8.1 The Pooled Within-Group Matrices[a]**

		Age	Marital status	Education level
Covariance	Age	92.440	1.573	-1.548
	Marital status	1.573	.163	-.016
	Education level	-1.548	-.016	.169
	Number of children	13.647	.277	-.271
	Family background	-.169	.013	.028
Correlation	Age	1.000	.405	-.392
	Marital status	.405	1.000	-.098
	Education level	-.392	-.098	1.000
	Number of children	.695	.336	-.323
	Family background	-.036	.067	.139

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Table A8.1 contd. Pooled Within-Groups Matrices[a]

		Number of children	Family background
Covariance	Age	13.647	-.169
	Marital status	.277	.013
	Education level	-.271	.028
	Number of children	4.173	-.038
	Family background	-.038	.244
Correlation	Age	.695	-.036
	Marital status	.336	.067
	Education level	-.323	.139
	Number of children	1.000	-.037
	Family background	-.037	1.000

a. The covariance matrix has 1998 degrees of freedom

Summary of Canonical Discriminant Functions

Table A8.2 Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.155a	100.0	100.0	.367

a. First 1 canonical discriminant functions were used in the analysis.

Table A8.3 Classification results

Are you employed?		Predicted Group Membership		Total
		Yes	No	
Original Count	Yes	194	101	295
	No	432	1273	1705
Original %	Yes	65.8	34.2	100.0
	No	25.3	74.7	100.0

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Table A8.4 Pooled Within-Groups Matrices

	Age	Marital status	Education level
Covariance Age	64.233	1.102	-.875
Marital status	1.102	.230	-.007
Education level	-.875	-.007	.252
Family background	.370	.045	.047
Number of children	6.401	.164	-.097
correlation Age	1.000	.287	-.217
Marital status	.287	1.000	-.029
Education level	-.217	-.029	1.000
Family background	.080	.163	.163
Number of children	.557	.239	-.135

	Family background	Number of children
Covariance Age	.370	6.401
Marital status	.045	.164
Education level	.047	-.097
Family background	.335	.048
Number of children	.048	2.055
correlation Age	.080	.557
Marital status	.163	.239
Education level	.163	-.135
Family background	1.000	.058
Number of children	.058	1.000

Table A8.5 Functions at Group Centroids

Are you employed?	Function
	1
Yes	.837
No	-0.554

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