INFLUENCE OF SOME SELECTED PERSONALITY VARIABLES ON ACADEMIC ACHIEVEMENT OF HIGH SCHOOL STUDENTS IN KAKAMEGA DISTRICT, KENYA.

BY

CHRISPUS KOINANGE WAWIRE

A THESIS SUBMITTED IN PARTIAL FULFILMENT FOR THE DEGREE OF MASTER OF EDUCATION (M.ED.) IN EDUCATIONAL PSYCHOLOGY, KENYATTA UNIVERSITY

2004
DECLARATION

This thesis is my original work and has not been presented for a degree in any other university or any other award.

Signed: Crispus K. Wawire
Date: 

This thesis has been submitted with our approval as University Supervisors.

Signed: Prof. A. Nwoye
Chairman Department of Psychology
Kenyatta University

Signed: Dr S. Tumuti
Chairman Department of Educational Psychology
Kenyatta University
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Title Page</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declaration</td>
<td>II</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>III</td>
</tr>
<tr>
<td>List of Tables</td>
<td>VII</td>
</tr>
<tr>
<td>List of Acronyms</td>
<td>VIII</td>
</tr>
<tr>
<td>Dedication</td>
<td>IX</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>X</td>
</tr>
<tr>
<td>Abstract</td>
<td>XI</td>
</tr>
<tr>
<td>Chapter One</td>
<td>1</td>
</tr>
<tr>
<td>1.0 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Background of The Study</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Statement of The Problem</td>
<td>6</td>
</tr>
<tr>
<td>1.3 Purpose of The Study</td>
<td>7</td>
</tr>
<tr>
<td>1.4 Research Questions:</td>
<td>7</td>
</tr>
<tr>
<td>1.5 Significance of The Study</td>
<td>8</td>
</tr>
<tr>
<td>1.6 Assumptions of The Study</td>
<td>10</td>
</tr>
<tr>
<td>1.7 Scope/Delimitations of The Study</td>
<td>10</td>
</tr>
<tr>
<td>1.8 Definition of Terms</td>
<td>10</td>
</tr>
<tr>
<td>Chapter Two</td>
<td>12</td>
</tr>
<tr>
<td>2.0 Review of Related Literature</td>
<td>12</td>
</tr>
</tbody>
</table>
## 2.1 Introduction

2.2 Theoretical Framework

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.1 Eysenck's Biological Theory of Personality</td>
<td>12</td>
</tr>
<tr>
<td>2.2.2 Predicative Model</td>
<td>12</td>
</tr>
<tr>
<td>2.2.3 Causal Model</td>
<td>14</td>
</tr>
</tbody>
</table>

2.3 Alder's Theory on Ordinal Positions

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3.1 First Born</td>
<td>17</td>
</tr>
<tr>
<td>2.3.2 Second Born (Child)</td>
<td>18</td>
</tr>
<tr>
<td>2.3.3 Middle Born (Child)</td>
<td>18</td>
</tr>
<tr>
<td>2.3.4 Youngest Child</td>
<td>18</td>
</tr>
<tr>
<td>2.3.5 Only Child</td>
<td>19</td>
</tr>
<tr>
<td>2.3.6 Other Sibling Situations</td>
<td>19</td>
</tr>
</tbody>
</table>

2.4 Introversion/Extraversion Relationship with Academic Achievement

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4.1 Studies with Younger Children</td>
<td>20</td>
</tr>
<tr>
<td>2.4.2 Studies with Older Students</td>
<td>21</td>
</tr>
<tr>
<td>2.4.3 General Studies on Extraversion-Introversion</td>
<td>22</td>
</tr>
<tr>
<td>2.4.4 Studies in other Cultures other than Africa</td>
<td>24</td>
</tr>
<tr>
<td>2.4.5 Studies on Actual Classroom Teaching:</td>
<td>25</td>
</tr>
<tr>
<td>2.4.6 African Studies</td>
<td>26</td>
</tr>
<tr>
<td>2.5 Ordinal Position Relationship with Academic Achievement</td>
<td>27</td>
</tr>
</tbody>
</table>

2.6 Summary of Literature Review | 33 |

2.7 Research Hypotheses | 34 |

### Chapter Three

3.0 Research Design and Methodology | 36 |

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Introduction</td>
<td>36</td>
</tr>
<tr>
<td>3.2 Research Design and Variables</td>
<td>36</td>
</tr>
<tr>
<td>3.3 Population and Sample</td>
<td>37</td>
</tr>
</tbody>
</table>

3.4 Research Instruments

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1 Eysenck Personality Questionnaire (E.P.Q)</td>
<td>38</td>
</tr>
<tr>
<td>3.4.2 Academic Achievement Instrument</td>
<td>39</td>
</tr>
<tr>
<td>3.4.3 Respondent's Background Information Sheet</td>
<td>40</td>
</tr>
<tr>
<td>3.4.4 Reliability and Validity of the Instruments</td>
<td>40</td>
</tr>
</tbody>
</table>

3.5 Data Collection Procedure | 40 |
Chapter Four ..................................................................................................................43

4.0 Results ...................................................................................................................... 43

4.1 Introduction .............................................................................................................. 43

4.2 Descriptive Statistics ........................................................................................... 43

4.2.1 Introversion/Extraversion Academic Achievement ........................................ 43
4.2.2 Ordinal Position Relationship with Academic Achievement ........................ 44
4.2.3 Relationship Between Gender and Academic Achievement ........................ 45

4.3 Statistical Analysis ............................................................................................... 46

4.3.1 Research Question 1: To What Extent Does Personality Type Orientation Influence One's Academic Achievement? ......................................................... 46

4.3.2 Research Question 2: Does the Mean Academic Achievement of Introverts Differ Significantly, From The Mean Academic Achievement of Extraverts? .... 47

4.3.3 Research Question 3: To What Extent Does One's Ordinal Position Influence One's Academic Achievement? ............................................................... 48

4.3.4 Research Question 4: Does the Mean Academic Achievement of First Borns Differ Significantly from the Mean Academic Achievement of Subsequent Siblings? ................................................................................................................................. 49

4.3.5 Research Question 5: Does the Mean Academic Achievement of Boys Differ Significantly from the Mean Academic Achievement of Girls? ............. 51

4.3.6 Research Question 6: Is There an Interactional effect Between Introversion/Extraversion, Ordinal Position, Gender and Academic Achievement? .... 52

Chapter Five ................................................................................................................ 54

5.0 Discussion .............................................................................................................. 54

5.1 Introduction ............................................................................................................ 54

5.2 Discussions of the Results ................................................................................... 54

5.2.1 Research Question 1: Does the Mean Academic Achievement of Introverts Differ Significantly from the Mean Academic Achievement of Extraverts? ... 55

5.2.2 Research Question 2: To What extent does one’s Ordinal Position influence One’s Academic Achievement? ............................................................... 58

5.2.3 Research Question 3: Does the Mean Academic Achievement of Boys Differ significantly from the Mean Academic Achievement of Girls? ............. 60

5.2.4 Research Question 4: Is there an Interactional Effect among Personality Gender and Academic Achievement ............................................................... 61
5.3 Implications of these Findings

5.3.1 Implications for Teachers

5.3.2 Implication for Parents

5.3.3 Implication for Policy Makers

5.3.4 Implications for Teacher Trainers

5.4 Recommendations

5.4.1 Recommendations for Teachers

5.4.2 Recommendation for Parents

5.4.3 Recommendations for Policy Makers

5.4.4 Recommendations for Further Research

References

Appendix I: Respondents Background Information Sheet

Appendix II: Eysenck Personality Questionnaire
LIST OF TABLES

Table 1: Variables and their level of measurement ........................................37
Table 2: Mean Score and Standard Deviation of Introverts and Extraverts ....... 43
Table 3: Mean Score and Standard Deviation of First, Middle & Last Borns .... 44
Table 4: Variation in Gender on Academic achievement ................................. 45
Table 5: Regression Analysis to Show the Relationship Between Personality and Academic achievement

Table 6: ANOVA Testing for Significant Difference in Means Between Introverts and Extraverts ................................................................. 47
Table 7: Relationship between ordinal position and academic achievement .......... 48
Table 8: Ordinal position and academic achievement ..................................... 49
Table 9: Variation in ordinal position and academic achievement ................... 50
Table 10: Multiple Comparisons of Means Among First Borns, Middle Borns and Last Borns ................................................................. 50
Table 12: Interaction between gender, introversion/extraversion, and ordinal position ................................................................. 52
Table 13: Multiple Regression Analysis to Show the Individual Contribution of Gender, introversion/extraversion and Ordinal Position on academic achievement ................................................................. 53
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCR</td>
<td>Unconditioned Response</td>
</tr>
<tr>
<td>UCS</td>
<td>Unconditioned Stimulus</td>
</tr>
<tr>
<td>CS</td>
<td>Conditioned Stimulus</td>
</tr>
<tr>
<td>CR</td>
<td>Conditioned Response</td>
</tr>
<tr>
<td>IQ</td>
<td>Intelligence Quotient</td>
</tr>
<tr>
<td>ARAS</td>
<td>Ascending Reticular Activating System</td>
</tr>
</tbody>
</table>
DEDICATION

With affection and gratitude I dedicate this thesis to:

My dad Paul Khafumi Koinange
My mum Valentine Naswa.
ACKNOWLEDGEMENTS

There are many individuals to whom I am indebted for inspiring and encouraging me throughout the period of this study. My sincere thanks go to Prof. Augustine Nwoye and Dr. Sammy Tumuti, my supervisors, whose intelligent comments and careful attention to detail helped to shape my work.

I am very grateful to my dad Paul Khafumi Koinange who gave me the discipline that has always been the ladder to my academic excellence and for funding the study. Thanks, too, go to Rev Fr Patrick Kelly Mirimo my parish Priest and mentor, who out of his generosity kept my life smooth throughout the period of my study.

Thanks also are extended to some anonymous readers – all of whom helped with insightful comments.

Special thanks and appreciation to the school heads and students of St Kizitos, Chebuyusi and Namirama for their kind participation and co-operation in the study.

Many different secretaries worked on this thesis, the major contributions were made by Grace and Mary. I appreciate the care they devoted to their task.

I would like to express my indebtedness to my classmates and friends for the moral support they accorded me during the period of my study.

Many people gave me generous help and encouragement in connection with this study. I have not always succeeded in making the most of their advice. To all and many more thank you.

Finally, to protect the innocent, I must acknowledge full responsibility for mistakes, if any in the final work.
ABSTRACT

The objective of this study was to investigate the influence of some selected personality variables: introversion/extraversion, birth order and gender, on academic achievement of high school students in Kenya. Specifically this study looked at the difference between introverts and extraverts in academic achievement. It also investigated the difference in academic achievement between first borns, middle borns and last borns and lastly gender difference in academic achievement was also explored. The study used both the correlational and ex-post facto designs. The participants were given questionnaires (EPQ), to categorize respondents as either introverts or extraverts; and respondents' questionnaire to elicit information on ordinal position.

The independent variables in this study were: extraversion- introversion, ordinal position and gender. The dependent variable was academic achievement. The participants in the study were 78 boys and 92 girls.

The findings of the study show that:

a) The mean academic performance of introverts is higher and significant than the mean academic performance of extraverts.

b) There is a strong and positive relationship between ordinal position and academic achievement. There is a decreasing achievement with subsequent siblings, last-borns being on the deficit end.

c) There is a significant difference in student’s academic performance due to gender. Male gender outshine their female counterparts.
From the findings of the study it was established that greater socialibility of extraverts appears to disrupt their studies whereas good study habits like self-discipline, consistency and perseverance that are related to introversion tend to present important factors needed in academic success at high school. The study also revealed first borns as higher performers. This could be because of first born’s earlier exposure to a mature environment, higher expectations set by parents and the benefit that accrue to them as teachers of later siblings and finally a higher score reported for boys could be because girls are motivated to fail because to them higher performance is equated to loss of femininity by socialising agents.

This study is important in relation to individual differences among students and the need for identifying this by those concerned with education of the young. It is in line with these understandings that recommendations were made for parents, teachers, policy makers, teacher trainers and researchers.
CHAPTER ONE
INTRODUCTION

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

One of the recurrent themes in educational research today is the attempt to unravel the complex determinants of academic achievement. Early work in this area concentrated on intelligence as the explanatory variable (Brody, 1976; and Guildford, 1967) and this is still believed to be the single most effective predictor of school achievement. With time, however, a wide variety of research reports drew attention to the importance of social factors and early experience (Vernon, 1969) as well as the influence of the general environment on the development of intelligence and the level of school achievement. But it is now coming to be understood that any attempt to understand the complete causal chain associated with school attainment must include the effect of personality on the child’s work in the school. Personality has been defined by Allport, (1963) as:

Dynamic organisation within the individual of tnos-psychophysical systems that determine his characteristic behaviour and thought (p. 2).

If this definition is accepted it appears inevitable that personality will be another important determinant of classroom behaviour and ultimately of scholastic success. It is in this perspective that the present researcher would like to review the personality theory advanced by Eysenck (1944) with particular focus on the predicative and Causal Models in explaining differences between introverts and extraverts and Adler's theory on ordinal
positions to see their differences in academic achievement due to their positions in the family.

Eysenck, (1944) developed a theory of personality, which argued that the most distinctive aspects of human personality could be grouped into two major traits: Extraversion and Introversion, and that these traits could be effectively measured using psychometric tests. These personality type orientations, which Eysenck identified, related to how sociable or unsociable people seemed to be. Nevertheless, this was not just about liking to interact with people. The responses to his questionnaire, according to him, tended to link with the answers to questions about impulsiveness, risk taking and stimulus seeking. Eysenck argued that the personality dimension underlying this cluster of traits was all to do with the amount of stimulation, which, an individual required. He named the dimension Introversion-Extraversion; terms, which had been originally developed by Jung to describe characters that were either withdrawn or self-sufficient (Introverts) or outgoing and sociable (Extraverts).

According to Eysenck, the presence of extraverted and introverted tendencies in one's behaviour is pervasive in nature, that is, it applies to his or her behaviours in a variety of situations and may be seen expressed in various areas of life. He observes that extraverted and introverted tendencies appear earlier in childhood and evidence more stability through the developmental years than most personality characteristics.

Researchers interested in these personality dimensions have correlated them with variables such as anxiety and impulsiveness (Berlin, 1974), self-concept (Bayer, 1976) criminality (Black, 1972), social behaviours (Brand, 1972), and academic performance (Larry, 1976). This last variable is part of the focus of this study.
In the educational realm, as in many other vocational fields, teachers have succumbed to the cult of the warm, outgoing, amiable and extraverted personality, and have tended to regard any deviation from this standard as axiomatically undesirable from a mental hygiene standpoint. Yet, there is absolutely no evidence that introverted personality impairs the learner’s mental health, even though the student may conceivably be less popular as individuals than their extraverted colleagues. Research on the other hand consistently shows that extraverts are only superior in academic performance to introverts in the pre-school and primary school ages up until perhaps 12-15 years of age (Stedman and Adams, 1972). Then a transition occurs and beyond that level introverts are superior to extraverts. This particular claim, however, has not been validated by a field research in the Kenyan context.

Again just like extraversion-introversion variable, birth order carries its own psychological implications that can have a bearing on a student's academic performance. In most societies, some individuals come to control great wealth, wield enormous power and to acquire converted honours, titles, and privileges just by virtue of their position in the family. Faith in superior endowment of the first offspring has fostered laws of succession, inheritance, and so on favouring the firstborn child – especially the male child- that still prevail in many countries including those in Africa South of the Sahara. In fact, it was not until the turn of the 20th century that this faith and corresponding laws of primogeniture were challenged. At this time, geneticists, pathologists and psychologists began to explore the question from a variety of perspectives and indeed, the first studies, appeared to provide empirical substance for the belief in the superiority of the eldest. Cherian, (1990), published his observations on the birth rank of scientists and concluded
that the first-born is to be found in greater frequency among scientists than the later born and that this over representation occurs for all family sizes.

It is a common fallacy to imagine that children of the same family are formed in the same environment. There is much that is the same for all children in the same home, but the psychological situation of each child is individual and differs from that of the others in the same family because of the order of their succession (Adler, 1956). It is not, of course, the child’s number in the order of successive births which influences his character, but the situation into which she/he is born and the way in which she/he interprets it.

Adler advanced the theory of ordinal positions to explain different lifestyles people are likely to adopt depending on the family environment in which they were born. He believes that the psychological situation for children with different ordinal ranks varies a great deal. Parental attitudes to pregnancy vary as a function of the previous number of children in the family. In addition, parent’s knowledge of how to behave in different upbringing situations can be supposed to be related to family size. From the child’s point of view there is a considerable variation in the social and interactional pattern in the family as a function of the number of siblings (Adler, 1956). For a younger child there is always one or several older siblings, who are seen as natural parts of the family, while the first-born experiences a gradual growth of the family and his/her chances to take up the parent’s time fully is continuously decreasing.
During the last few decades many studies have dealt with the relationship of birth order to various dependent variables. The most often used dependent variables are intelligence, conformity, popularity, delinquency, alcoholism, schizophrenia, and academic performance. Most of such researches were however, conducted by scholars in foreign countries.

In Kenya, there are a lot of variations in academic achievement of students at Kenya Certificate of Secondary Education (KCSE) held at the end of the 4th year programme of Secondary Education. Many students continue to perform poorly in these examinations in spite of the fact that they follow a common syllabus. Even those students who have studied together in the same class through their secondary education perform at different levels. Kakamega District has continued to perform poorly in National examinations although it excels in extra curricular activities.

This poor performance at KCSE has drawn the attention of the government, educationists, and teachers; researchers, parents and pupils themselves, in search of the basic factors concerned. To gain an answer to this, some have studied certain factors, which have been recognized as possible contributors to the variations in academic performance. The variables studied include, among others; the student’s family background (Maundu, 1980) self-concept (Maritim, 1983) family size (Bali, Drenth, 1984) pupil’s attitude (Wanderi, 1989) achievement motivation (Kitivo, 1989) peer influence, absenteeism, (Gitonga, 1997) and the like. None of these studies to the best of the present researcher’s knowledge has attempted to unravel the relationship between one’s personality type orientation, and academic achievement. Yet this is an important area to explore.
It is this kind of gap in our present state of knowledge in this area that this study intends to close.

1.2 STATEMENT OF THE PROBLEM

Drawing from what has been stated, it is clear that an individual's personality type orientation influence how he/she will perform at school. Although introverts ability to put constraints on their behaviour should lead them to higher academic achievement than extraverts, this has not always been the case. This relationship has been found to be positive, negative or non-existent when varied cultures are considered in studies.

Existing literature points at the need to include a learner's ordinal position, and gender as variables in the study of the relationship between personality type orientation and other dependent variables such as academic achievement. Studies point to the fact that introversion/extraversion dimensions cannot make predictions of achievement when each individual learner is affected by the psychological situation into which he/she is born and bred. A learner's ordinal position in the family needs to be considered in a study on the relationship between introversion/extraversion and academic achievement since research findings seem to suggest that such a consideration may offer a solution to some of the inconsistencies in literature in this area.

Most studies on introversion/extraversion and ordinal positions were done in western countries. It appeared interesting to find out if a similar study carried out in a developing country like Kenya will corroborate the earlier findings. The central problem therefore was to investigate the influence that exists between introversion/extraversion, ordinal position, gender and academic achievement.
1.3 PURPOSE OF THE STUDY

Since there is a lot of emphasis placed on good examination results in our society, poor performance becomes an issue of great concern to parents, teachers and educationists. For this reason it was the primary concern of this study to determine the relationship between a student's personality type orientation: introversion/extraversion, ordinal position, gender and academic achievement. This study intended to explore the extent to which the students' personality type orientation; extravert or introvert, and ordinal position, the two key variables emphasized in western countries, are important predictors of the quality of academic achievement of learners in the Kenyan context.

The study also investigated whether there was any significant correlation among introversion/extraversion, ordinal position, gender and academic achievement. In this case, each variable was correlated with each other variables under study.

In order to fulfil these purposes, the following research questions were formulated.

1.4 RESEARCH QUESTIONS:

(a) To what extent is one's personality type orientation related to one's academic achievement?

(b) Does the mean academic performance of introverts differ significantly from the mean academic achievement of extraverts?

(c) To what extent is one's ordinal position related to one's academic achievement?
(d) Does the mean academic achievement of first-borns differ significantly from the mean academic achievement of subsequent siblings?

(e) Does the mean academic achievement of extravert/introvert boys differ significantly from the mean academic achievement of extravert/introvert girls?

(f) Is there an interactional effect between introversion/extraversion, birth order gender and academic achievement?

1.5 SIGNIFICANCE OF THE STUDY

The evaluation of students' progress is very essential because it serves as a basis on which education decisions concerning students are made. It is for this reason that knowledge of factors that influence the outcome of academic achievement should be clear to educators, parents and pupils themselves so that standards of academic performance can be enhanced.

It is for this reason that this study aimed at investigating and addressing the two major factors that are related to academic achievement in the Kenyan context. The negative effects of these factors are amenable to change and their change would facilitate the development of positive interest in the learner to excel academically. Such information will be useful to teachers, counsellors, education planners, the researcher and others charged with the responsibility of enhancing academic performance of students in high school.

A teacher armed with such knowledge, for example, that students' personality type orientation influences academic performance, may help students who have concentration problems by providing a variety of activities in the process of teaching to
maintain high level concentration for maximum learning. Such knowledge will also eradicate stereotype behaviour of teachers in assessing the student's personality and appreciate individuals’ differences among learners, which can be explored for the motivation of each student. These findings may serve as a starting point for the provision of guidance and counselling services to students on their academic achievement. It was hoped that educators, parents and teachers would benefit from the findings of the study in selecting means and ways of motivating students to learn and in helping students adopt appropriate traits that are consistent with high academic achievement.

A teacher informed about individual differences among his or her learners can possibly evaluate his teaching style and use of materials to suit each student. Similarly, a parent who realises that academic achievement of a child can be influenced by the psychological situation that arises from a rank a child holds in the family, would probably direct his parenting style in such away as to create a favourable environment that is motivating for each of the sibling and which is consistent with high aspirations.

It was hoped that this study would contribute towards the understanding of academic achievement by showing how it is influenced by the variables studied. Additional information on factors that affect academic performance should be of benefit to educationists and psychologists because study findings in this area are not yet conclusive.

Finally, this study will enhance the researcher's understanding of his professional field, giving him an abiding interest in his problem as a stimulus for further research in this area by himself and others.
1.6 ASSUMPTIONS OF THE STUDY

The study assumed that:

(i) The variables under study are related, that is, introversion/extraversion orientation, ordinal position and academic achievement.

(ii) Learners differ profoundly from one another in the directions required by the theories.

1.7 SCOPE/Delialimitations of the Study

(a) The time given was only sufficient to carry out the study in Kakamega district.

(b) A more direct measure of academic achievement was not available, so mock examinations were used as a measure of academic achievement.

(c) Other personality types were not considered because they are situational and have not been known to be of importance in a study of this nature.

1.8 DEFINITION OF TERMS

a) Extravert - One who is interested directly in the environment or the external world, and the world of people. He/she is an outward-motivated person and is visibly moved by the present and is endowed with active habits.

b) Introvert - One who is interested in his/her own ideals, thoughts, and feelings through which he/she derives values from external world including other persons. He is a ‘shut in’ person within his/her own self, he/she is self restrained; one with a minimal emotional expression.
(c) **Ascending reticular activating system**

It is an inherited anatomical structure, which regulates levels of arousal ranging from sleep to a state of high alertness.

(d) **First born**

An eldest sibling in the family or any permanent guest in the home older than any other sibling born in the family. This may include adopted children.

(e) **Last-born**

She/he is the youngest in the family for a period lasting 12 years’

(f) **Personality type orientation**

It is the persistent enduring features of a person’s behaviours that constitute his or her personality.

(g) **Ordinal position**

It is the rank a child holds among the siblings born from one mother or in the family
CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This section examines the theoretical framework on extraversion-introversion as presented by Eysenck. Adler's theory on ordinal positions will also be highlighted. Studies on extraversion-introversion and birth order as they relate to academic achievement will next be presented. Hypotheses to guide the present study are stated at the end of this section.

2.2 THEORETICAL FRAMEWORK

2.2.1 Eysenck's Biological theory of personality

We shall focus on his two models; Predicative and causal models.

2.2.2 Predicative Model

In his early descriptive research, Eysenck, (1957), pointed out that individuals differ in the reactivity of their brains and central nervous system and in the speed with which they develop conditioned responses. His first causal explanation in, (1957); traced the difference between extraversion and introversion to variations in the central nervous system levels of inhibition and excitation. He suggested that individuals with strong excitatory and weak inhibitory potentials are likely to become introverted. In extraverts, their less sensitive, less aroused, and more inhibitory brain process require them to look for continued outside stimuli in order to overcome their own passivity. These individuals are insensitive to low-intensity stimulation because their strong inhibitory process
suppresses it. They need to seek more stimulation and can tolerate much higher levels of it before their cortical processes act protectively to inhibit further increases. On the other hand, the more sensitive more aroused, and less inhibitory introvert needs to withdraw from the outside world in order to avoid being overwhelmed. These individuals are quickly satiated at rather low levels of stimulation. Relating to relationship between excitation and inhibition to extraversion and introversion, Eysenck predicted that introverts could be more readily conditioned than extraverts because they have a higher drive (excitatory processes) and weaker inhibitory processes. Frank (1956) tested this prediction by studying eye blink conditioning. Frank's experiment was a classical conditioning paradigm, in which a puff of air to the eyeball (UCS) causing the eye to blink (UCR) was paired with a buzzer (CS). After repeated pairings, subjects blinked on hearing the buzzer in the absence of the puff of air. This blink is a conditioned response. It was found that introverts acquired the conditioned response after fewer pairings of a buzzer and air-puff than did extraverts and also that introverts required more trials to extinguish the response than extraverts. The psychophysiological explanation for these observed differences in conditionability is that since introverts are at a higher level of arousal than introverts, their nervous systems are more ready to form the necessary associations.

According to this model then it was expected that introverts would perform better in class structures where conditioning is used as a motivational factor in teaching.
2.2.3 Causal model

In 1967, Eysenck revised his theory and hypothesised that specific biological functions were responsible for excitation and inhibition. This second explanation traced the difference between extraversion and introversion to levels of cortical arousal. Eysenck, (1967) suggested that introversion – extraversion is related to arousal threshold in the ascending reticular activating system (ARAS) of the brain. The primary function of the ARAS is to regulate levels of arousal ranging from sleep to state of high alertness. Destruction of these tissues causes an animal to sleep almost continuously. Whereas stimulation will cause it to become aroused. Thus the ARAS controls the brains level of excitability and its responsiveness to stimuli.

Eysenck believes that introverts may have higher levels of ARAS reactivity than extraverts. Thus given identical stimulation conditions, the state of arousal would be higher in introverts than in extraverts. The high level of arousal may create a constraint on their behaviour and contribute to the specific traits such as being reserved and careful, that generally characterises introverts. In the same way, the low levels of arousal experienced by extraverts may lead to an absence of constraints and a predominance of impulsive and outgoing behaviours normally associated with extraversion.

The 1967 theory of the biological basis for introversion-extraversion placed the emphasis on excitation rather than inhibition. This emphasis led to a shift in efforts of inhibition and toward the effects of ARAS arousal. McLaughlin and Eysenck (1967) offered a test of the new model by combining it with the Yerkes–Dodson law of motivation and performance. The Yerkes-Dodson law maintains that the relationship between motivation and performance is curvilinear. As motivation increases performance
increases until an optimal point is reached, after which increasing motivation decreases performance. Optimal performance generally occurs at moderate levels of arousal. Without sufficient motivation, one will not put forth the effort to accomplish a task. However too much pressure may lead to such a high level of motivation that it actually interferes with our performance. The relationship between motivation and performance also varies with the difficulty of the task. A high level of motivation may be required to complete a very simple task in order to sustain concentration and avoid boredom. A lower level of motivation leads to better performance on a very difficult complicated task.

Eysenck’s theory allows for specific prediction and test. For example, if introverts have strong excitatory brain processes and relatively weak inhibitory effects, they should and do react more quickly in certain structured laboratory situations such as eye-blink conditioning (Eysenck, 1963). Electrocardiogram studies and other electrophysiological studies also lend some support to Eysenck’s theory. It has been possible to indicate introversion or extraversion by comparing the amount of salivation produced when lemon juice is applied on someone’s tongue with the amount created without lemon juice. Introverts produce considerably more salivation than extraverts do (Corcoran, 1969). This suggests that the same physiological functions control both salivation characteristics and introversion-extraversion characteristics. Research has also shown that introverts are more sensitive to stimulant drugs while extraverts are more sensitive to depressant drugs.

Eysenck’s theory that reticular activating system arousal can account for the differences in the reactions of extraverts and introverts continues to garner support from other scholars (Bullock and Gilliland, 1993). Some researchers however, attribute the
differences in reactions to brain mechanisms other than the reticular activating system (Stelmack, 1990).

Behaviour itself is not inherited; certain structures of the nervous system are. The phenotype, the individual’s observable appearance and behaviour arise out of the genotypes interaction with the environment (Engler, 1999). The genotype evolves into inherited anatomical structures, which include the cortex, the autonomic nervous system, the ascending reticular activating system and the visceral brain. Individuals differ widely in the particular of these structures. These differences lead to the development of different habitual levels of arousal and threshold for emotional response, which can be seen in laboratory experiments. These tendencies lead to the various introverted or extraverted phenotypic patterns of behaviour. Eysenck is not suggesting that genes determine the outcome for any given individual. Genes are not certain predictors for specific patterns of behaviour or development. Many genes express themselves only under certain conditions. Our genetic predispositions are affected by the specific experiences we have from conception onward.

There has been a certain number of experimental evidence, which seems to support this theory. For example, Larry (1976), found that introverts seem to do much better at long boring vigilance tasks than extroverts do; extroverts find it hard to maintain concentration for lengthy periods of time. The explanation for this was that introverts could maintain an optimal level of cortical functioning more easily under conditions of limited stimulation. But these results are not necessarily evidence for differing levels of cortical activity; it might simply be that the extraverts become bored and careless because of learned habits; since they are used to being with other people and having a lot going
on, they find it harder to adjust to a task which involves minute concentration for long periods of time. It will be interesting to find out how these factors relate to the academic performance of high school students in the present study.

2.3 Alder’s theory on ordinal positions.

Classification of human beings for the purpose of establishing typologies predates even Plato (Breland, 1974). The hope has been that through placing man in one or another category or classification in terms of his/her birth order, behaviour could be predicted. Most of these attempts have been based on physical typology. A few have been based on other characteristics. Order of birth or the rank a child held in his family, eldest, middle, youngest or only child, was used by Adler as a basis for predicting characteristics behaviour of individuals falling into one or another of these ordinal categories.

2.3.1 First-born

The first born usually receives undiluted parental attention until the second child arrives. Adler, (1956) describes first-borns as usually conservative in attitude. According to him they generally tend to support and defer to adults and authority figures. They may be highly organised, assume responsibility over the younger children, are conscientious and have acceptable ways of coping with life tasks. He observes that sometimes they may become suspicious and hostile to others if their social interest goal is deficient. But if excessively pampered he warns; they may feel discouraged and resentful of the next child.
2.3.2 Second born (child)

The next child tries to surpass any standards set by older child depending on how he/she interprets the situation, he/she may, according to Adler, from being discouraged, become the opposite of what the first is; competitive, less responsible, more independent, ambitious and interested in what the older child does not master, especially if she/he perceives the older child as successful in many areas of life or as resentfully of him and of treating him badly. This discouragement, he asserts, may then move this second child to set unattainable goals for himself which might lead to failure.

2.3.3 Middle born (child)

He/She feels squeezed in the family not enjoying any of the advantages of the older nor of the young one. Adlers describes him/her as sensitive, rebellious, independent and strives in directions opposite to the older child. Adler asserts that middle borns in particular perceive their position as the most burdensome and constantly seeks open assurance of their place in the family from parents.

2.3.4 Youngest child

Adler describes him/her as the pet of the family. The youngest child has the advantage of many role models in the family, which encourages him to excel over others as a way to establish a place in the family. If he is pampered Adler points out that he may act helpless and dependent, expecting others to attend to his every wish. On the other hand, he may use his charm to warm his way through life. Adler warns that if pampered he may find it difficult to cope with life's tasks. If the family values as well as behaviours
encourage high achievement and the child sees this as a way of making his way in the family, he might turn out to be the greatest achiever.

2.3.5 Only child

Adler observes that, he/she spends most of his/her time with adults. For this reason, he matures early, developing a rich imagination, learning to be highly creative and introjects the manners, behaviours and attitudes of adults early in life. On the other hand, Adler does argue that not having experienced competition, nor felt dethroned by another sibling in the family, he might find it difficult to co-operate with his peers, especially when he starts school, as he has not learned to compete for attention.

2.3.6 Other sibling situations

An only boy brought up in a family of girls has a hard time before him. He is in a wholly feminine environment, since the father is absent most of the day. Feeling that he is different, he may grow up isolated. On the other hand, Adler points out that he may fight strongly against this atmosphere and lay great stress on his masculinity. He will feel that he must assert his differences and his superiority; but there will always be tension. Adler observes that his development will proceed by extremes, training to be either very strong or very weak. In a rather similar way, an only girl among boys is apt to develop very feminine or very masculine qualities. Adler asserts that frequently she is pursued through life by feelings of insecurity and helplessness.
2.4 Introversion/Extraversion relationship with academic achievement.

2.4.1 Studies with younger children:

One study of pre-school and first-grade children (Stedman & Adams 1972) indicates a strong superiority of extraverted over introverted children. The subjects in the study were disadvantaged Mexican-American children, who were tested for personality and achievement differences at the beginning of a pre-school Headstart program and tested again at the end of the first grade with Metropolitan Achievement test. Seventy-six children were involved in the study. Of all the measures taken at the beginning of the Headstart program, extraversion was the best predictor of achievement at the end of the first grade. If these results apply to the general population of pre-school and first grade children as well as to disadvantaged children, the greatest superiority of extraverts over introverts occurs at the earliest ages. In this context, the interesting question is, ‘To what extent will this trend be repeated when another sample is used?’

In another study of younger students Stedman & Adams, (1972) the correlation between extraversion and both intelligence and achievement were consistently small but positive. White, Black and Mexican-American students in the fourth through the eighth grades in California were given a battery of tests including the Junior Eysenck Personality Inventory, at the beginning of the school year and tested by the Stanford Achievement Test at the end of the school year. In this particular study, the strongest relationships occurred at the sixth grade level in favour of the two groups.

Barton and Cattel, (1974) collected data that appear to apply to the beginning of the transition period. Using Cattel's High school personality questionnaire, which was scored for introversion and extraversion, large samples of both sixth and seventh grades
were administered intelligence and achievement tests at six-month intervals over a 12-month period. The findings relating to extraversion that were reported in the article indicated a change over time in the relationship between extraversion and social studies grades. Initially extraverts scored higher than introverts; but at six-months and one year later they were equal to introverts in social studies scores. Over this time-span all subjects improved, but introverts improved more than extraverts. Interestingly on both extremes, introverts and extraverts scored higher than did a group of ambiverts. It appeared that the subjects in this study were undergoing the transition, the quality of which appears to be that introverts were catching up so that they were equal to the extraverts by the time they reached the end of seventh grade.

2.4.2 Studies with older students

FinLayson & Banks, (1973) carried out a detailed longitudinal study of 345 boys, covering the ages of 11-15. School examination performance was studied in relation to Junior Eysenck Personality Inventory scores. In general, introverts performed better, especially in two schools where ability and aspiration levels were higher. Moreover, the relationship between introversion and performance increased with age. Results were also strengthened when extreme over and under-achievers were considered. There were two clusters of variables in the study that were related to successful academic performance. One centred on achievement motivation whereas introversion was an important element of the other. Included with introversion were: intellectual curiosity, homework orientation, parental warmth and support, combined with dependence and conformity on the part of the boy and a slower development of interest in girls.
Apparently, the transition period occurs over a lengthy period and is seen most clearly in the basic science. A study by Seddon (1976) used 741 15-17 year old chemistry students at various education levels. Employing multiple regression analysis he found that extraversion-introversion was not related to IQ but was related to achievement in chemistry. For a sample as a whole there was a negative correlation of extraversion with chemistry achievement, an indication that for these students the transition had already occurred. More important, however, there was an interaction between extraversion and age that indicated that the negative correlation of extraversion with performance increased at each age level so that prediction of the superiority of introverts continued to increase with each year of experience. A few weeks after the above data were collected, the same subjects were exposed to nine-session self-instructional chemistry program (Seddon 1977) According to pre- and post treatment scores on a background chemistry test, there was an interaction as in the earlier data between extraversion and chronological age.

2.4.3 General studies on extraversion-introversion

Levy & Carlson, (1973) in their study found that Eysencks personality types differed in their cognitive or mental functioning. They concluded that persons categorised s introverted have better memories for neural or impersonal stimuli, such as numbers, whereas persons labelled extraverted have better memories of human stimuli with emotional overtones such as various facial expressions.

In another study using the MBTI, introverts and extraverts were compared on the quality of their classroom discussion in undergraduate psychology courses. Extraverts
contributed little to the discussions, whereas introverts made frequent and highly thoughtful contributions.

Research using Eysenck's tests, the Maudsley Personality Inventory and the Eysenck Personality Inventory, also provides support for Eysenck's personality types. In one study, persons scoring high on extraversion were more popular than those scoring high on introversion (Brown & Hedrick, 1971). Introverts were more sensitive to pain and to stimulant, more easily bored, and more careful in their work than were extraverts. They also learned more quickly and forgot more slowly (Wilson & Kennard, 1978).

Additional research using the Maudsley Personality Inventory revealed that extraverts were more suggestible, more sexually active, more likely to earn lower grades in school, and more strongly predisposed to jobs that would bring them in contact with other people than were introverts, (Pervin 1984).

Campbell and Hawley (1982) carried out a study among students in a university library. Extraverts reported taking more study breaks than introverts, and they were more concerned than introverts to select a study location that offered socialising opportunities. It may simply be that extraverts have a greater variety of interesting social engagements competing for their time, so that they spend less time studying than introverts. If we can assume that the greater sociability of extraverts begins to disrupt their study habits from early adolescence onwards, this would account for superior academic attainment until age of 13 or so.

Goh and Moore (1978) did not discover any significant differences between introverts and extraverts in the number of hours spent studying but Banks and Finlayson
(1973) found that introverted boys had a greater commitment to homework than extraverted boys.

In a typical study, (Campbell 1982) subjects had to learn how to solve odd-man-out problems involving figures and spatial patterns. Introverts learned better when they followed a carefully sequenced highly promoted learning structure, whereas extraverts were more successful when presented with a random arrangement. Other researchers (e.g. Shabott 1978) have also discovered that introverts learn better in structured learning environments whereas extraverts learn better in relatively unstructured learning environments. At least until quite recently, educational provision has tended to approximate more closely to a structured than an unstructured system. Consequently, the academic superiority of introverts may be due in large measure to the fact that the educational system is more closely geared to their needs than to those of extraverts. But the issue is; will this trend of introverts as superior in academic performance be corroborated in the present study when a Kenyan sample is studied instead?

2.4.4 Studies in other cultures other than Africa

In general, however studies conducted in other cultures indicated that either the transition to introverts superiority occurred considerably later or that there would simply no relationship between extraversion-introversion and scholastic performance in those cultures. Paramesh, (1976) found no relationship between extraversion (Eysenck personality inventory) and performance in seven different subject areas among 155 high school boys in India. Similarly, Mehryar, Khajari, Razaviah and Hosseini, (1973) found no correlation between college achievement and extraversion in Izani. They correlated on
Iranian Version of the Eysenck Personality Inventory with college entrance exams. Only a small positive relationship of extraversion with IQ and no relationship between extraversion and either math or natural sciences scores were found for either females or males.

Organ, (1975) pinpointed some of the study habit differences between introverts and extraverted individuals; they may be connected with their different achievement at advanced educational levels. Subjects were 50 graduate business students in each of three classes who were given an opportunity in the course to earn bonus points with high scores on pop quizzes. There was a negative correlation between extraversion and bonus points earned that was not accounted for by aptitude differences. This implies that introverts have more consistent study habits and respond better in the college environment. The above results show that the earlier trend of Western studies, which showed that introverts do better than extraverts on scholastic achievement tests, should not be taken as conclusive.

2.4.5 Studies on actual classroom teaching:

A few studies involving actual classroom learning experiences of introverted and extraverted students have been conducted. One example involved a pair of studies by Leigh, (1973) and Trown & Leith (1975). Leigh briefly describes four studies where he discovered that adolescent introverts did better if there was more guidance prompting and structures, whereas extraverts did better in more ambiguous exploratory atmosphere. Thus the most important implication was that teaching strategy must be matched by
personality type in order to be maximally effective. It appeared that introverts needed more structure whereas extraverts needed less.

Renner, (1975) examined the performance of master's level education students in Australia in four different courses. Unexpectedly for the authors scores on the Eysenck Personality Inventory were unrelated to preference for written essay work versus formal examinational and unrelated performance. Extraverts out performed introverts in only one course- Education Sociology, and the authors surmised that this might have been the result of a lower degree of class structure in the course.

Other attempts to relate personality differences to instructional variables have not met with similar success. Robertson, (1978) was interested in attention deployment in grammar school students: attention deployment was defined as whether they chose to study only one or more than one topic simultaneously in a programmed study of probability theory. No relationship to Eysenck Personality Inventory Score was found. Power, (1977) likewise could find no effect on extraversion and rate of interaction with teacher on several indices of achievement in eighth grade science classes.

2.4.6 African studies.

One study conducted with Black Ugandans (Home & Kline, 1974) seems to pinpoint the transition point at a slightly later age. With black rural Ugandans aged 14, 15 & 17, the only relationships between extraversion and achievement occurred in the younger girls for whom there were positive correlation's with three of the five academic subjects used.
In another study by Orpen, (1976) comparison was made between rural South African blacks and Afrikaans - speaking rural whites. The results were the same for both groups. In a group of 14-year-olds of both races, the correlation between extraversion and achievement was positive whereas in a group of similar students of both races at the college level the relationship between extraversion and achievement was negative. In both cases, achievement was based on performance on regular year end examinations.

In conclusion, literature review on extraversion introversion presents different opinions as to the interpretation of how the age effect occurs. Entwistle, (1970) discusses the difference in terms of different responses to social motivation on the part of introverts and extraverts and indicates that the introvert is a late developer educationally because the social motivations so important in early school years are not as important to the introverted as to the extraverted child. However at more advanced levels of education, social motivation takes second place to individual or intrinsic motivation in the educational attainment. It is true that good study habits including self-discipline, consistency and perseverance are related to introversion and are an important factor in academic success at the later grade levels. It may be that the superiority of the extraverted child arises from the fact that he or she is an early developer both in terms of personality and ability.

2.5 Ordinal position relationship with academic achievement.

Studies relating intellectual performance to birth order report conflicting results, some show intellectual scores to increase while others show decrease with birth order. In
contrast, the relationship between intellectual performance and family size is stable and consistently replicable favouring the first-born.

According to Adler, (1956) first-borns are concerned with power and authority. One way for first-borns to gain power and authority as adults is through a high level of achievement in their work. Thus first-born should score very high in achievement test and indeed, this Adlerian idea has received much research support.

In virtually every field of endeavour from attending college to managing a multinational conglomerate, first-borns are over-represented relative to their proportion in the population. More first-borns than later-born become eminent. They tend to reach higher levels of intellectual achievement in academic settings and higher levels of power and prestige in their careers (Breland, 1974 Schachter, 1963). Eysenck and Cookson, (1969) in their study found first-borns consistently scoring higher than later borns on a variety of academic tests, including English, Mathematics and Verbal skills as well as on test of verbal reasoning ability.

Evidence also suggests that firstborns may be higher in intelligence than later born. The IQ scores of nearly 400,000 Dutch males were analysed with respect to birth order and the results showed that first-borns had higher IQ scores than second-borns. Second-born in turn had higher scores than third borns and so on (Belmont & Marolla, 1973). These findings have been confirmed for females as well as for males in several countries (Zajonc & Markus, 1979). One explanation for the apparent higher intelligence of first-borns relates not to genetic differences but rather to the first-borns initial and exclusive exposure to adults. Consequently, firstborns are likely to experience a more
stimulating intellectual environment than later-borns (Zajonc, 1979). Thurstone and Jenkins, (1979) examined a large number of children and concluded quite explicitly:

On the whole the later born sibling's tend to be on the average brighter than the first-born. Not only does this seem to be the case in the comparison of the first-born with the subsequent children, but the rise in intelligence with the order of birth seem to continue as far as the eighth-born child( p. 157).

It will be interesting to find out whether the present study with a Kenyan sample will corroborate this result or the earlier ones favouring the dominance of first-borns in academic achievement

Other studies followed, some reporting increments with birth order, some decrements. Among studies that found decreasing intelligence or scholastic scores with birth order were those of Altus, (1966) & Breland, (1974). Increases in intelligence scores with birth order were reported by Koch, (1954). Zajonc, (1979) and his colleagues. They focused on the dilution of home intellectual atmosphere by mixing later-born children with firstborns and the adults who constitute the firstborn's mature environment. Zajonc and Markus (1979) have related family size to intellectual development. Using data on nearly 400,000 Dutch 19 years old males, they found larger family size detrimental to intellectual development. They explained this result by reasoning that each later-born child added to a family of increasing size dilutes the intellectual atmosphere for all children. Further, the larger the family, the more compressed the spacing between children, which leads to a decline in average age of family members, and in turn, a more immature intellectual atmosphere for each child. In sum, large families immerse children
in a later-born intellectual atmosphere, one created by cognitively primitive people, a sharp contrast to the adult atmosphere that exists for firstborns.

The intellectual responsibility of older and younger children differs within the family. Specifically, only the last born children are not teachers in the broad sense of the word, and it is assumed that the relatively low performance scores often reported for them in the literature are associated with this lack of teaching opportunity (Zajonc & Markus, 1979).

Since last-born children do not normally serve as intellectual resources to their siblings, a condition assumed to enhance intellectual growth (Zajonc, 1979) and since except for twins, each child is at some age the last child in the family, the rate of intellectual growth during such periods is affected accordingly. It may be that the firstborn benefit by virtue of being a teacher and the cumulating of this benefit may eventually lead the firstborn to surpass his or her siblings.

Studies that examine adults never show the second born surpassing the firstborn. For example, Cattell and Brimhall, (1981) found firstborns to be overrepresented in American men of science relative to second-born in two child families.

Gini, (1975) reported an overrepresentation of firstborns among Italian university professors, as did Poole & Kheln, (1973) among British university graduates. Among younger children aged 6 to 8 years the second born surpasses the firstborn. Among the older children this pattern is reversed. Moreover as predicted, only children score higher than the firstborns among the youngest group, but from age 7 they are consistently disadvantaged.
The general finding that the firstborn tends to gain greater eminence in school and later life (Altus, 1966 Sampson 1965, Schacter, 1963) though disputed (Bayer, 1966) has led to questions about the kinds of parental expectations and pressures for success exerted upon the firstborns as compared with the second born. In addition, numerous studies have considered possible IQ differences between firstborns and later-born children (Sampson, 1965).

It has been suggested that greater parental pressures are directed toward the firstborn's achievement and acceptance of responsibility (Davis 1941, MC Arthur 1956 Rosen 1961) that the firstborn is often given the role of parental surrogate (Sutton Smith, Roberts & Rosenberg, 1964), that the parents talk and interact more with the firstborn (Bossard, 1945) and pay more attention to the firstborns (Koch, 1954 Rosen, 1961), and Philips, (1956) have proposed that since parents have no frame of reference in their expectations for firstborns they tend to over estimate his ability more than the second born, setting higher standards for his performance.

Among the consistent findings on birth order has been that firstborns are significantly higher in achievement need (Sampson, 1965), social orientation (Smart 1965), and affiliation need under stress (Schachter, 1959). This literature presents a picture of firstborns as high achieving -other directed people.

Family size and sex have an effect on ordinal position performance. Literature on family size indicate that children from larger families rely more on their peers than on their parents (Doreran & Adelson, 1966), have less achievement motivation and are forced into high interaction with a subgroup of siblings rather than with their parents. Even firstborns are seen to suffer from family expansion in large families in that they are
placed often into surrogate parents’ role, which limit their achievement (Bossard & Boll, 1956).

In the case of females the literature suggests that those from smaller families would be higher achievers than those from larger families. The firstborn female from smaller families would have experienced greater adult-child interaction and less limitation on their achievement motivation (Bossard, 1956).

Horner, (1968) feels that firstborn girls who are motivated to fail feel ambivalent about success because intellectual achievement is equated with loss of femininity by socialising agents and eventually by the female herself. According to her, by adolescence most girls are highly aware of and concerned about social disapproval for so-called masculine pursuits. They move toward conformity with societal expectations that, relative to male, they should be nonachievement oriented and dependent.

Cherian, (1990) found that among 1021 South African school children, the later were children born into their families; the lower was their academic achievement. An additional study by Ishiyama Munson, (1990) produced logically related results, among 194 Canadian high school students, compared to later born, first-borns showed less fear of the possible negative consequences of academic success (an example of negative consequence would be facing higher expectations after scoring a success).

Some more contemporary studies also appear to support Adler’s notion about birth order. For example Parish, (1990) investigated teachers’ evaluation of 94 students support systems (a support system is composed of friends and relatives who provide comfort in times of distress). He found that firstborns experience fewer dysfunctional
support systems than later-born. This we can say enables the firstborns to concentrate maximally on academics.

Less research has been conducted on second-born children, and there seems to be no support for Adler's contention that they are more competitive and ambitious than their siblings are. One study did find that second-born were lower in self-esteem than first or last born particularly if they were about two years in age difference between them and the older and younger siblings (Kidwell, 1982).

2.6 Summary of Literature review

A theoretical analysis of personality types of introversion and extraversion indicates that introverts’ ability to put constraints on their behaviour and their high level of conditionability gives them an advantageous position to out perform extraverts when exposed to the same environmental stimulation. This assertion has been supported by studies reviewed, which actually show the superiority of introverts over extraverts on a number of achievement tests. This superiority does not mean that the IQ for introverts is higher than extraverts but as has been explained extraverts have a greater variety of interesting social engagements competing for their time, so that they spend less time studying than introverts. Extraverts are said to be superior to introverts in lower class levels but greater sociability of extraverts at adolescent stage onwards begin to disrupt their study habits accounting for their inferior academic attainment at higher levels of education. However this particular claim has not been validated by a Kenyan study and among the Asians it was either negative or neutral.
Ordinal position theory on the other hand portrays first borns as high achieving. Indeed this assertion has been corroborated by a number of studies done in Western countries although it was not supported when other cultures were considered. Family size and ones gender has an effect on academic performance. Studies indicate that large families immerse later borns in an intellectual atmosphere, one created by cognitively primitive people hence limiting their performance. From the studies we also learn that girls are motivated to fail because passing is equated to masculinity. Most studies in this direction were done in two child families in Western countries. The question to be asked here is this: Will this trend of first borns as superior in academic achievement be supported by the data to issue from this study when a Kenyan sample is used?

2.7 Research hypotheses

1. There is a relationship between one’s personality type orientation and academic achievement.

2. There is a positive and significant relationship between introversion and academic achievement at high school.

3. There is a negative and significant relationship between extraversion and academic achievement at high school.

4. First born’s score higher than later borns on a number of achievement tests relative to their proportion in the general population.

5. Middle borns are generally low academic achievers.
Later borns in large families are consistently disadvantaged in academic achievement compared to earlier siblings.
3.0 RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

Described in this section are the research design, sample and sampling method, instruments for data collection and procedures that were followed in the study as well as techniques used for data analysis.

3.2 RESEARCH DESIGN AND VARIABLES

The research design for this study was both correlational and ex-post-facto. The correlational approach was considered appropriate because the researcher did not attempt to exert an influence on a measured response. Since variables were not controlled, this approach did not attempt to identify causal relations among variables but instead it aimed at identifying the variables that occur together. No attempt therefore was made to manipulate some variables and hold other constant. A correlational approach was considered appropriate because the study sought to establish whether there was a relationship between:

(a) Gender and academic achievement
(b) Extraversion and academic achievement.
(c) Introversion and academic achievement
(d) Birth order and academic achievement.
The ex-post-factor research design was implicated because the study involved the relationship of some independent variables (introversion-extraversion and ordinal position) on a dependent variable academic achievement) for which the researcher did not have control or could not manipulate variables and their level of measurement. Variables and their level of measurement are shown in table 1 below:

Table 1: Variables and their level of measurement

<table>
<thead>
<tr>
<th>Independent Variable and Level of Measurement</th>
<th>DV &amp; Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introvert Nominal</td>
<td>Academic achievement (interval)</td>
</tr>
<tr>
<td>Extrovert Nominal</td>
<td></td>
</tr>
<tr>
<td>Boy Nominal</td>
<td>Academic achievement (interval)</td>
</tr>
<tr>
<td>Girl Nominal</td>
<td></td>
</tr>
<tr>
<td>First born Nominal</td>
<td>Academic achievement (interval)</td>
</tr>
<tr>
<td>Middle born Nominal</td>
<td></td>
</tr>
<tr>
<td>Last born Nominal</td>
<td></td>
</tr>
</tbody>
</table>

3.3 POPULATION AND SAMPLE

The population of the study was form four students in Kakamega District; a total of 170 students from Form four classes took part in this study. The sample comprised of 78 boys and 92 girls. Three schools were selected, that is, boy school, girl school and mixed sex school. Form four class was selected based on the following considerations:

(a) They were taking their mock examinations, which were used by the researcher to measure academic achievement.
(b) It was easier for them to interpret the questionnaire considering their wide experience at school.

(c) It is an examination class and teachers, parents and students themselves take their academic achievement seriously and hence reasons for passing or failing are important for those concerned.

The sampling unit consisted of secondary schools in the entire Kakamega District. By purposive sampling three schools were considered in the study making a sample of one hundred and seventy participants.

3.4 Research Instruments.

Described here are the instruments that were used to measure extraversion-introversion and to obtain information on ordinal position.

3.4.1 Eysenck Personality Questionnaire (E.P.Q)

The EPQ constructed by Eysenck (1976) will be used. This instrument was constructed with the purpose of measuring the personality variables of extraversion-introversion in adolescents. Norms for the scale show its use among males and females of high school and college levels.

This scale and the attendant definition of the concept of extraversion-introversion is the most popular in current use, and its usefulness is supported by data such as those by Handel (1976), which showed that the scale has considerable equivalence across age groups and across cultures.
The instrument consists of 110 questions that are dichotomously scored on a YES/NO basis. This questionnaire can take 30 minutes to complete and score. No special room arrangements, special materials or preparation was required. The researcher adapted the questionnaire to make it fair in terms of vocabulary and length. This exercise reduced the numbers of items to 70. A higher score of 40 and above on the scale indicated extreme extravert and a lower score of 20 an extreme introvert. The items in the scale cover factors like sociability, impulsiveness, carefree dispositions, and fluctuations in mood, activity and so on. The spearman rho estimated a reliability of 0.92 with this scale (Eysenck, 1963).

The scale would seem to embody a number of desirable features:

(a) It is based on a definite theory of personality, which may be empirically tested.

(b) The scoring method is empirically validated on groups whose life histories show them to differ profoundly from each other in the directions required by the theory.

(c) Statistical treatment of the data is more adequate than is usual with scales of this type.

(d) Wide spread use of the scale in industries appear to have shown it to have a certain amount of validity.

3.4.2 Academic Achievement Instrument

Mock exams scores for form IV class was used to assess the students' academic performance. The mock exam is set by a group of teachers from various schools in the district. The mock exam was used because there was no standardised achievement
battery, which was available for use with form IV. A mean score from subjects registered for was used.

3.4.3 **Respondent's background information sheet.**

This questionnaire sought to find out the respondents; name, age, number of siblings, type of family he/she comes from, ordinal position, and information on other members in the family. This helped the researcher to compare the respondent's ordinal position and academic achievement.

3.4.4 **Reliability and validity of the instruments**

A pilot study was carried out prior to the main study. This was not only to help the researcher assess the type of responses he was expected to gather from the field but also allow him to familiarise with the administration as well as scoring procedures of the EPI. Results of the pilot study were useful in identifying and dropping unreliable items in the questionnaire and in the improvement of others where there was need.

3.5 **DATA COLLECTION PROCEDURE**

The eysenck personality questionnaire was distributed to the students and time given for them to complete the questionnaire. It was then followed by the Respondent's background information sheet. Time in which the questionnaire was to be completed was flexible because clarifications were done in areas that individual students needed explanations. Mock examinations were given on request.
3.6 DATA ANALYSIS TECHNIQUE

The data collected was coded and entered in the computer. Statistical package for social sciences was used to analyse the data. Descriptive as well as inferential statistics were used to summarise and make conclusions on the data.

Testing for the significance of the hypotheses was as follows:

The first hypothesis stated: There is a relationship between a pupil's personality and his or her academic achievement. Regression analysis was computed and coefficient of determination ($R^2$) was established giving a percentage of total variance accounted for by personality.

The second hypothesis was: There is no significant difference between extraverts and introverts on academic achievement. An F test was performed on the mean scores at $P=0.05$. This determined the difference and direction of the difference.

Hypothesis three stated: There is no significant relationship between an individual's ordinal position and academic achievement. Regression analysis was computed and coefficient of determination was established. An F test was done at $P=0.05$. This determined the difference and direction of the difference.

The fourth hypothesis was: There is no significant difference in student's academic achievement due to variations in their ordinal position. Regression analysis was computed and F values were obtained at $P=0.05$ showing difference in means and direction of the difference.
Hypothesis five stated: There is no significant difference in academic achievement due to variations in Gender. One-way ANOVA was performed at $P=0.05$ giving the difference and direction of the difference.

The sixth hypothesis was: There is no significant difference between ordinal position, gender, personality type orientation and academic achievement. Multiple regression was done giving an $R^2$ and F value at $P=0.05$. 
CHAPTER FOUR

4.0 RESULTS

4.1 INTRODUCTION

This chapter presents results and statistical analysis of the data collected from 170 participants in three secondary schools in Western Province of Kenya. The presentation is divided into two sections. The first section contains the descriptive statistics and the second section has the statistical analysis and hypotheses testing.

4.2 DESCRIPTIVE STATISTICS

4.2.1 Introversion/Extraversion Academic achievement.

Data on personality type orientation was collected from 170 participants in three secondary schools. Of these 80 were introverts and 90 extraverts. The mean scores and standard deviation were obtained and the results are shown in table 2.

<table>
<thead>
<tr>
<th>PERSONALITY TYPE</th>
<th>N</th>
<th>MEAN SCORE</th>
<th>STANDARD DEVIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introvert</td>
<td>80</td>
<td>34.55</td>
<td>8.34</td>
</tr>
<tr>
<td>Extravert</td>
<td>90</td>
<td>26.14</td>
<td>8.02</td>
</tr>
</tbody>
</table>

Table 2: Mean Score and Standard Deviation of Introverts and Extraverts

KEY:
N = Number of students
The data tabulated in Table 2 above indicates that the mean academic performance of introverts is higher (34.55) than the mean academic performance of extraverts (26.14). The standard deviation for performance of introverts was larger (8.34) than the standard deviation of extraverts (8.02). This shows that the extraverts were more homogeneous in academic achievement than introverts. The larger standard deviation for introverts suggests that there were some students who scored higher than the rest of the group.

4.2.2 Ordinal Position Relationship with Academic achievement.

From the data, the participants' academic performance in relation to ordinal position was established. The ordinal position included, first borns, middle borns and last borns. In the sample of 170, first borns were 33, middle borns were 120 and last borns were 17. The means and standard deviation scores were obtained and results are shown in table 3.

Table 3: Mean Score and Standard Deviation of First, Middle & Last Borns

<table>
<thead>
<tr>
<th>ORDINAL POSITION</th>
<th>N</th>
<th>MEAN SCORE</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>First borns</td>
<td>33</td>
<td>32.85</td>
<td>8.22</td>
</tr>
<tr>
<td>Middle borns</td>
<td>120</td>
<td>29.76</td>
<td>9.05</td>
</tr>
<tr>
<td>Last borns</td>
<td>17</td>
<td>27.18</td>
<td>9.72</td>
</tr>
</tbody>
</table>

KEY

N = Number of Participants
SD = Standard Deviation
The results in table 3 show that:

(a) The middle borns are majority (120) in the population.

(b) The first-borns have the highest mean score (32.85) compared to the middle borns (29.76) and last borns (27.18) respectively.

The SD obtained for first borns shows that there was homogeneity in performance amongst them compared to middle borns and last borns respectively whose standard deviation indicates that there was diversity in scores amongst them.

4.2.3 Relationship between Gender and Academic achievement

Gender variations in achievement were also identified. In the data collected boys numbered 78 while girls 92. The mean performance of boys was slightly higher (32.33) than the mean academic performance of the girls (28.21). The results are shown in table 4.

Table 4: Variation in Gender on Academic achievement

<table>
<thead>
<tr>
<th>GENDER</th>
<th>N</th>
<th>MEAN SCORE</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boy</td>
<td>78</td>
<td>32.33</td>
<td>8.34</td>
</tr>
<tr>
<td>Girl</td>
<td>92</td>
<td>28.21</td>
<td>9.46</td>
</tr>
</tbody>
</table>

KEY

N = Number of Participants
SD = Standard Deviation
The SD recorded for girls was 9.46 while that for boys it was 8.34. This indicates that boys were homogeneous in performance and that girls varied widely amongst themselves in academic performance.

4.3 STATISTICAL ANALYSIS

In this section each of the hypotheses is discussed briefly in relation to the results obtained from the statistical analysis.

4.3.1 Research Question 1: To What Extent Does Personality Type Orientation Influence Ones Academic Achievement?

It was hypothesized in the study that there is a relationship between a pupil’s introversion/extraversion dimension and his or her academic achievement. Regression analysis was computed and coefficient of determination ($R^2$) was established. Results are presented in Table 5.

Table 5: Regression Analysis to Show the Relationship Between introversion/extraversion and Academic achievement.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>R</th>
<th>R SQUARE</th>
<th>ADJUSTED R SQUARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>459</td>
<td>.210</td>
<td>.206</td>
</tr>
</tbody>
</table>

From the table we observe that introversion/extraversion accounted for an $R^2$ of .210 of the total variation in academic achievement. An $R$ square of .210 means that 21% of total
variance in students academic achievement was accounted for by introversion/extraversion dimension. This value is high and significant.

From the results, the research failed to reject the alternative hypothesis that stated: There is a relationship between one's personality type orientation (introversion/extraversion) and academic achievement. It was therefore concluded that the participants’ personality was significant in influencing academic achievement.

4.3.2 Research Question 2: Does the Mean Academic Achievement of Introverts Differ Significantly, from the Mean Academic Achievement of Extraverts?

The mean academic achievement of introverts and extraverts were 34.55 (SD 8.34) and 26.14 (SD 8.02) respectively. The means differed significantly t (21.256=0.00) P<. 05 in favour of introverts. Since the calculated t is greater than the critical t-value, we reject the null hypothesis that the means of the two groups are not significantly different. In this case we conclude that introverts achieve higher than extraverts in academics.

Analysis of variance was also done and results are presented in Table 6.

<table>
<thead>
<tr>
<th>SS</th>
<th>DF</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>SIG.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>408.505</td>
<td>2</td>
<td>204.2798</td>
<td>2.470</td>
</tr>
<tr>
<td>Within Groups</td>
<td>13870.7</td>
<td>167</td>
<td>82.699</td>
<td></td>
</tr>
</tbody>
</table>

Table 6: ANOVA Testing for Significant Difference in Means Between Introverts and Extraverts
Results from the F test in Table 8 indicate that means differed significantly at F (2.470 = 0.085) at P=0.05. There was a significant difference in means between introverts and extroverts on academic achievement. The null hypothesis is thus rejected. It was therefore concluded that there is a difference in achievement between introverts and extraverts.

4.3.3 Research Question 3: To What Extent Does One’s Ordinal Position Influence One’s Academic Achievement?

Regression analysis was done and coefficients of determination (R2), F and t tests were computed. The results are tabulated in Table 7.

Table 7: Relationship between ordinal position and academic achievement.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>R</th>
<th>R SQUARE</th>
<th>SD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.23</td>
<td>0.274</td>
<td>7.89</td>
</tr>
</tbody>
</table>

From the results in Table 9 above the following observation can be made:

(i) The R square = 0.274 means that 27% of the total variance in students' academic achievement was accounted for by ordinal position. This value shows the extent to which ordinal position influences academic achievement. This value is high and significant.

A t-test was also carried out to find out the contribution of ordinal position to academic achievement and the results are shown below in Table 8.
Table 8: Ordinal position and academic achievement.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>STANDARDISED COEFFICIENTS</th>
<th>STANDARDISED COEFFICIENTS</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Std. Error</td>
<td>Bêta</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>35.618</td>
<td>2.577</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordinal Position</td>
<td>2.895</td>
<td>1.302</td>
<td>.169</td>
<td></td>
</tr>
</tbody>
</table>

From Table 8 above, ordinal position has a significant contribution towards academic achievement at P<0.05 level of significance. From the results, there is a significant relationship between ordinal position and academic achievement. Therefore, the null hypothesis that there is no significant relationship between ordinal position and academic achievement was rejected.

4.3.4 Research Question 4: Does the Mean Academic Achievement of First borns Differ Significantly from the Mean Academic Achievement of Subsequent Siblings?

The mean performance for first borns, middle borns and last borns were 33.85 (SD 8.92), 29.76 (SD 9.05) and 27.18 (SD 9.72) respectively. The means varied significantly F (2.470 = 0.88) P<.05 as shown in table 9 below:
Table 9: Variation in ordinal position and academic achievement.

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>408.595</td>
<td>2</td>
<td>104.298</td>
<td>2.470</td>
<td>0.88</td>
</tr>
<tr>
<td>Within groups</td>
<td>3381.705</td>
<td>167</td>
<td>82.699</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The F-value shows that the contribution of the selected ordinal position variables is significant at P<0.05 level of significance. When multiple comparisons was done using LSD the following results were obtained.

Table 10: Multiple Comparisons of Means Among First Borns, Middle Borns and Last Borns.

<table>
<thead>
<tr>
<th>Ordinal Position</th>
<th>Mean Difference</th>
<th>Standard Error</th>
<th>Sig</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>LSD First</td>
<td>3.09 5.69*</td>
<td>1.79 2.71</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td>Middle Last</td>
<td></td>
<td></td>
<td>.038</td>
<td>-44 .31</td>
</tr>
<tr>
<td>First Last</td>
<td>-3.09 2.58</td>
<td>1.79 2.36</td>
<td>.086</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.275</td>
<td>-6.62 -2.07</td>
</tr>
<tr>
<td>Last First</td>
<td>.5.67* 2.58</td>
<td>2.71 2.36</td>
<td>.038</td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td></td>
<td></td>
<td>.275</td>
<td>-11.03 -7.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Mean difference is significant at P=.05 level

From the above table the following results observations can be made:

(i) The mean difference between first borns and last borns is significant at P<0.05 level.

(ii) That first borns perform better than both middle borns and last-borns.
(iii) Last borns compared to first borns and middle borns are disadvantaged in academic achievement.

4.3.5 Research Question 5: Does the Mean Academic Achievement of Boys Differ Significantly from the Mean Academic Achievement of Girls?

Difference in achievement between boys and girls was established with the aim of answering the above question. Analysis of variance was performed and results are presented in table 11 below.

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>13500.409</td>
<td>1</td>
<td>718.891</td>
<td>8.946</td>
</tr>
<tr>
<td>Within groups</td>
<td>168</td>
<td>80.360</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above table F (8.946 = .003) is significant at P<0.05. This implies that the means of boys and girls differed significantly in favour of boys. Therefore, gender variable is significantly related to academic achievement. The null hypothesis that there is no significant difference in academic achievement due to gender was rejected.
4.3.6 Research Question 6: Is There an Interactional Effect Between Introversion/Extraversion, Ordinal Position, Gender and Academic Achievement?

Multiple regression analysis was done to find out the contribution of introversion/extraversion, gender and ordinal position on academic achievement. The results are presented in table 12 below.

Table 12: Interaction between gender, introversion/extraversion, and ordinal position.

<table>
<thead>
<tr>
<th>Multiple R</th>
<th>R Square</th>
<th>F</th>
<th>Sig. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>.523</td>
<td>.274</td>
<td>20.865</td>
<td>.00</td>
</tr>
</tbody>
</table>

From the above table 13, $R^2$ - Coefficient of determination, represents the variation explained by the 3 variables in the regression equation. The R square of 0.274 means that 27.4% of the total variance in academic achievement was accounted for by the interaction among gender, personality and ordinal position of the participants. This value is significant.

The value of F ($20.865 = 0.000$) at $P<0.05$ is significant. This implies that there is a strong relationship between the three variables on academic achievement. A t-test was also performed to find out individual contribution of the independent variables on student academic achievement. It was assumed that there was no interaction among the independent variables. Table 13 summarises the results.
Table 13: Multiple Regression Analysis to Show the Individual Contribution of Gender, introversion/extraversion and Ordinal Position on academic Achievement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>t</th>
<th>Sig t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introversion/extraversion</td>
<td>6.856</td>
<td>.000</td>
</tr>
<tr>
<td>Gender</td>
<td>2.587</td>
<td>.011</td>
</tr>
<tr>
<td>Ordinal Position</td>
<td>2.307</td>
<td>.022</td>
</tr>
</tbody>
</table>

From the above results:

(i) All the variables had a significant contribution toward academic achievement.

(ii) Introversion/extraversion variable has a stronger contribution \( [t (6.856)=0.00] \) to the level of academic achievement when compared to gender and ordinal position.

(iii) The null hypothesis that "There is no significant difference between ones ordinal position, gender, introversion/extraversion and academic achievement was rejected at \( P<0.05 \)."
CHAPTER FIVE
DISCUSSION

5.0 INTRODUCTION

In Chapter Four a report of the results of the data analyses were presented. The major aim of this chapter is to discuss the findings in relation to the major research questions guiding the study and their implications for those concerned with the process of education and make relevant recommendations. This chapter is therefore organised into three sections. In section one, the results of the study are discussed. Section two contains the implications of these findings and the third section proposes some relevant recommendations.

5.2 DISCUSSIONS OF THE RESULTS

The main focus of this study was to establish if there was a relationship between introversion/extraversion, ordinal position, gender and academic achievement of high school students in Kakamega District.

The results obtained reveal that:

(a) Personality variable is an important determinant of academic achievement.

(b) Introverts mean academic achievement is significant and higher compared to those of extraverts.
(c) Ordinal position influences academic achievement.

(d) First borns score higher than both middle borns and last-borns relative to their proportion in the population.

(e) Gender was an important factor that determined academic achievement.

(f) The interaction effect among the variables; introversion/extraversion, gender, and ordinal position were significant in determining academic achievement.

5.2.1 Research question 1: Does the Mean Academic Achievement of Introverts Differ Significantly From the Mean Academic Achievement of Extraverts?

Table 2 presented the mean and standard deviation of academic achievement of introverts and extraverts whereas Table 6 presented the F-value to show the significant difference between the means.

The results obtained from both the descriptive and the statistical analysis showed that the mean academic achievement of introverts differ significantly from the mean academic achievement of extraverts favouring the introverts. These findings do support and extend Stedman and Adams (1972) findings that introverts are superior to introverts in academic achievement at high school and college levels.

This difference between introverts and extraverts cannot be attributed to IQ levels (Engler, 1999) but probably to the mode of delivery in our schools. Introverts are likely
to perform better in a classroom atmosphere where there is more guidance, prompting and structures, whereas extraverts do better in more ambiguous exploratory atmosphere (Trown & Leith 1975). The high achievement of Introverts is an indication that teachers pay too much attention on teaching methods that have more guidance, prompting and structures favouring Introverts and might be ignoring attention to ambiguous and exploratory methods that are good for Extraverts to learn better.

Studies by Banks and Finlayson (1973) also supported these findings. In their study among boys they found that introversion and achievement increased with age. Other studies that had similar findings include those of Seddon (1976) who found that prediction of the superiority of introverts continued to increase with each year of experience.

Studies in cultures outside the West however, fail to support the hypothesis that there is a relationship between an individual's personality orientation and academic achievement. Paramesh (1976) found no relationship between extraversion and achievement in seven different subject areas among 155 high school boys in India. Similarly Mehryar, Khajari, Razaviah and Hosseine (1973) found no correlation between college achievement and extraversion in Izani.

In light of these results it is interesting to consider differences in mental predisposition of introverts and extraverts. Levy and Carlson (1973) found that Eysenck's personality types differ in their cognitive or mental functioning. According to them, introverts have better memories for neural or impersonal stimuli such as numbers whereas persons labelled extraverted have better memories of human stimuli with emotional overtones such as various facial expressions.
Studies that looked into study behaviour of introverts and extraverts at high school and college levels also point to the fact that introverts are likely to be superior in academic achievement. Campbell and Hawley (1982) found that extraverts take more study breaks than introverts and were more concerned than introverts to select a study location that offered socializing opportunities. Banks and Finlayson (1973) found that introverted boys had a greater commitment to homework than extraverted boys.

In the EPQ (See appendix 11), extraverts answered -yes- on items that showed greater socialising opportunity whereas introverts answered -yes- on items that required personal reflection and concentration. It is fitting therefore to conclude from the present results, then, that extraverts have a greater variety of interesting social engagements competing for their time, so that they tend to spend less time studying than introverts. It can be assumed here that greater socialibility of extraverts is a negative asset that disrupts their study habits from early adolescence onwards.

At more advanced levels of education, it is a fact that social motivation takes second place to individual or intrinsic motivation in the educational attainment. It is true that good study habits such as self-discipline, consistency and perseverance are related to introversion and are an important factor in academic success at the later grade levels.

Eysenck, (1963), asserts that Extraverts seek social stimulation, physical arousal, and excitement to feed the never-satiated cortical lethargy. If this is the case, we may understand why extraverts perform better than introverts in primary schools and the reverse happens at higher grade levels (Stedman & Adams, 1972).
5.2.2 Research Question 2: To What Extent Does One's Ordinal Position Influence One's Academic Achievement?

In table 3, the mean and standard deviation of academic achievement among first born, middle born, and last born were presented whereas table 8 and 9 presented the T and F values respectively showing the significance difference between the means of the three groups.

The mean academic achievement between first-borns, middle-borns, and last-borns were 32.85, 29.76, 27.18 respectively (see table 3). These differed significantly F (2.47=0.88) at P≤0.05. These results do support and extend Eysenck and Cookson (1969) findings that first-borns consistently score higher than later borns on a variety of academic tests, including English, Mathematics and Verbal skills.

Other studies by Belmont and Marolla (1973) found that first-borns have higher intelligence than later borns. Altus (1966) and Breland (1974) also found decreasing intelligence or scholastic scores with birth order.

Cherian (1990) in his study found that the latter the children born were into their families; the lower was their academic achievement. Similarly Ishiyama Munson (1990) found that, compared to later borns, first-borns, showed less fear of the possible negative consequences of academic success.

In light of these findings it may be interesting to consider the dilution of home intellectual atmosphere by mixing later-born children with first-borns and the adults who constitute the first-born's mature environment. In the questionnaire in appendix 1 it was revealed that most of the participants came from large family sizes that had an average of
seven siblings or polygamous. In such a family one would expect parental attitude towards pregnancy and the manner of child rearing to change tremendously with each year of experience giving each child a unique psychological environment through which he or she grows. Zajonc and Markus (1979) found large family size detrimental to intellectual development. They explained this result by reasoning that each later-born child added to a family of increasing size dilutes the intellectual atmosphere for all children.

The results obtained indicate that first-borns perform better followed by middle borns and then last borns. These findings support Adler’s notion about ordinal position that first borns want to be leaders and the only way of doing this is by excelling in academics. This trend is supported by a study done by Koch (1952) who found increases in intelligence scores with birth order. However studies by Bossard and Boll (1956) found that first borns suffer from family expansion in large families in that they are placed often into surrogate parent role, which limit their achievement.

From the findings it can be observed that the intellectual responsibility of older and younger children differs within the family. Last-born children do not normally serve as intellectual resources to their siblings, a condition assumed to enhance intellectual growth (Zajonc and Markus 1979). This may explain their low score on academic performance. It may be that the first-born benefits by virtue of being a teacher, and the cumulating of this benefit may eventually lead to the first born to surpassing his or her older siblings. The apparent higher intelligence of first-borns may relate not to genetic differences but rather to the first-borns initial and exclusive exposure to adults. Consequently, first-borns are likely to experience a more stimulating intellectual
environment than later-borns. In the Respondents Background Information Sheet, (appendix 1), participants who reported having come from large family sizes also indicated a small age difference between them and their immediate followers. We can therefore say; the larger the family, the more compressed the spacing between children, which leads to a decline in average age of family members, and in turn, a more immature intellectual atmosphere for each child. This observation concurs with Zajonc & Markus (1979), that large families immerse children in a later-born intellectual atmosphere, one created by cognitively primitive people, a sharp contrast to the adult atmosphere that exists for first-borns.

In all cultures, studies seem to point to the fact that greater parental pressures are directed to the first-born's achievement and acceptance of responsibility (MC Arthur1986). He or she is given the role of parental surrogate and since parents have no frame of reference in their expectations for the first-born, we can assume that they tend to over estimate his/her ability more than the subsequent siblings, setting higher standards for his/her academic achievement.

5.2.3 Research Question 3: Does the Mean Academic Achievement of Boys Differ Significantly from the Mean Academic Achievement of Girls?

The results as presented in tables 4 and 11 show the male gender to be superior in academic achievement to the female gender.

Results from descriptive statistics showed that boys had a mean of 32.33 while girls had a mean of 28.21. These means differed significantly $F(8.946=0.003)$ at $P<0.05$. 
The results obtained support the hypothesis that there is a relationship between Gender and Academic achievement. These findings do support and extend Horner's (1968) assertion that girls tend to move toward conformity with societal expectation that, relative to males, they should be non-achievement oriented and dependent. It can be inferred from the findings that girls who are motivated to fail feel ambivalent about success because intellectual achievement is equated to loss of femininity by socializing agents and eventually by the female herself.

At adolescence most girls are very much aware of and are concerned about social disapproval for so-called masculine pursuits. Most girls do not express fear of failure because society has other important criteria of valuing the performance of girls other than academics.

5.2.4 Research Question 4: Is There an Interactional Effect Among Personality Gender and Academic Achievement.

All the variables studied had a significant contribution towards a student's academic performance (see table 13). Of all the variables analysed, introversion/extraversion had the highest value. This high value recorded for introversion/extraversion could be attributed to the speed at which they develop conditioned responses (Eysenck, 1957). In learning conditioning is important and this factor comes into play when introversion/extraversion dimensions are present. The student's ordinal position and gender cannot be overlooked in trying to understand the determinants of academic achievement because they are tied to the environment, which
either encourages or discourages effective conditioning of extraverts and introverts. Introversion/extraversion, ordinal position and gender have a greater influence on academic achievement and cannot be overlooked in trying to understand the complex determinants of academic success. One can be an introvert but the psychological situation into which he/she was born and bred may curtail the development of his/her potential to achieve to the expected level. Adler (1963) observes that a pampered or neglected child (mostly lastborns) may not be intrinsically motivated to achieve higher. Likewise an extravert who is a first-born may put in a lot of effort to achieve higher because of parental pressure and high standards set over him or her.

5.3 IMPLICATIONS OF THESE FINDINGS

The main aim of the study was to unravel the complex determinants of academic achievement. Such findings are of much importance to teachers, parents, policy makers and teacher trainers. In analysing the implications of the findings, these groups involved in the education of the young were the focus

5.3.1 Implications for Teachers

In the literature reviewed (Eysenck, 1967), Introverts are stimulus-shy whereas extraverts are stimulus hungry. This implies that Introverts requires low levels of motivation for learning to take place whereas extraverts require high levels of motivation to keep their brain activity active. It is also true that extraverts will require a variety of activities to keep them active or else they will become bored doing the same thing for a very long time. In light of this facts, then, it will be counter productive to use painful
stimulus like canning on introverts because they are satiated at low levels of motivation. Corporal punishment may be good for extraverts whereas verbal threats can be good for introverts.

In the education realm teachers tend to succumb to the cult of warm outgoing extraverted personality and tend to regard any deviation from this standard as academically undesirable. Yet, there is absolutely no evidence that introverted personality impairs the learners academic achievement, even though the student may conceivably be less as individuals than their extraverted colleagues. Such attitude towards the introverted child may affect the learner’s relationship with the teacher, impairing learning.

A student’s ordinal position, influences a lot, the level of interaction between the student and the teacher. First-borns may have learned to solve their problems with the adults and this makes them confide in teachers in tackling academic work. The middle borns on the other hand may have learned to resort to the peer for problem solving whereas the last borns have the expectation of things being done for them without their initiative (Bayer 1976). In the school setting rarely do teachers initiate personal relationship with the learners but only respond to learners who came their way. This manner of acting tends to benefit first-borns who have learned to seek for assistance from adults and negatively affects last borns who expect others to realise their problem and come to help them.

5.3.2 Implication For Parents

Our education system is examination oriented (Kitivo 1989). What matters is the mark a student gets and not the change the student is expected to show at the end of an
education system. This has led to parents' confining their children for long hours reading in the house with the intention of enabling them score a high mark to meet the cut off points required for admission to colleges. Yes, such a method may be beneficial to introverts who have the ability to do one thing for a very long period of time but may be unproductive to extraverts who become bored so easily (Eysenck1947).

Parents play a great role in the socialisation of their children. There is much that is the same for all children in the same home, but the psychological situation of each child is individual and differs from that of the others in the same family because of the order of their succession. Few parents are aware of this fact and tend to compare their children to one another making low achievers to withdraw completely from working hard to pass exams. This comparison of children tends to be in the form of later borns being compared to earlier siblings who may be doing better.

5.3.3 Implication for Policy Makers

The findings showed that personality influences academic achievement. It is also true that extraverted personalities are stimulus hungry and become bored in doing the same thing for a long time. The situation in our school is not conducive to some students. Almost all schools have double sessions for subjects that are believed to be hard like Mathematics and the sciences. This was probably hoped to be a solution to the poor performance in these subjects at the national examination level (Maundu 1980). Although the national results at the national level has never been different. It is now clear that subjecting an extravert to 90 minutes doing Mathematics or physics will instead of increasing performance lower it even further.
These long sessions may be good for introverts who can endure long hours without affecting their concentration considerably.

5.3.4 Implications for Teacher Trainers

Proper training of would-be teachers should be of crucial importance in preparing them to handle diverse personalities among students. The time allocated for teaching on personality assessment is never adequate to enable the teacher trainee to internalise the concept well.

The teaching practice for students only focuses on mastery of the content and little attention is given to assessing the knowledge the trainee has of the student being taught.

The findings revealed that learners are different and teaching without this knowledge may not help teacher to use the proper approach that will give maximum results.

5.4 RECOMMENDATIONS

5.4.1 Recommendations for Teachers

Teachers should understand that they have the ability to make a student learn or fail to learn. In this case, teachers should in the cause of interacting with the learners, categorise them in terms of their personality types so that each learner can be exposed to proper teaching methods that would facilitate maximum learning.

In case of the extraverts teachers should aim at presenting a variety of activities during teaching to keep their brain activity active. Teachers should focus on using all the senses of a learner and varying classroom structure, for example, learning through play, field walk and library study.
Teachers should involve their learners in setting rules that will enhance learning, for example keeping quiet while studying, ban unnecessarily walking in class while studying, discourage excessive social engagements at the expense of studying like listening to music, watching video or unnecessary chats.

Teachers should not overlook the needs of a learner. This can be achieved by asking learners to suggest what they want to learn. Motivation in class should be exercised with caution because excessive motivation may interfere with learning.

Teachers should always take the initiative of responding to learning difficulties of their learners instead of waiting for a learner to do so. To serve the interests of middle-borns who like confiding in their peers, teachers should encourage group work that is formed by the students themselves under his or her supervision and guidance. First-borns, since they like to be leaders, teachers should give them opportunity to be class prefects or group leaders to satisfy their egos.

5.4.2 Recommendation for Parents

Parents should be wary of the temptation of comparing their children because they are not the same (Adler 1956). Parents should treat each child individually. Parents should help their children learn how to observe rules and regulations at an early age. Children who behave in a manner suggesting the need for attention should be handled carefully. Good behaviour should be encouraged and bad behaviour discouraged.

Parents should avoid the temptation of pampering their last-borns or first-borns but should establish a standard by which they raise all their children. Each child's need should be attended to and low performers should be encouraged and not rebuked.
Parents should not be confining their children in the house with the hope that they will make them learn better but should let children have breaks while doing homework or reading on their own. Children should be allowed to engage into other social activities like watching and doing sports.

5.4.3 Recommendations for Policy Makers

The school curriculum should be made in such a way that a variety of activities are presented to benefit a variety of individual differences in the classroom. Enough teachers should be deployed so that the learners can have individual attention from the teachers.

Schools should be given a leeway to structure the school timetable without interferences from supervisors. The current long sessions should be spread across the day than having the same subject studied for along session at once.

5.4.4 Recommendations for Further Research

Additional research on the relationship between personality type orientation, birth order and academic achievement amongst students in secondary schools should be carried out in other areas not covered in the present study so as to get a comparative view of the findings of this study.

A broader sample with a bigger proportion of personality variables and birth order covering a wide geographic area would give more understanding on the relationship of introversion/extraversion, birth order and academic achievement.
Similar studies on other personality traits not included in this study should be carried out for comparison purposes.

Findings of such studies should be availed to schools, colleges, teachers and others concerned with the process and outcome of education. This would inform them on individual differences that are important in academic attainments and make them appreciate and draw necessary measures to curb negative consequences of such differences on academic achievement. Such measures may include having guidance and counselling teachers in schools to serve both the teachers and the learners.

It will be interesting if a wider study will be done to look into the whole issue of birth order to include second-borns and only children to bring out a clear picture of the nature and extent to which one's family rank can influence one's academic achievement.

In trying to categorize students into various personality variables (types), it could be interesting if any other method like the Lemon test is used together with the questionnaire to check for the reliability of such categorisation.

This research utilised the mean score of all the subjects that students did in their mocks. It can be interesting if one found out the achievement when subjects are classified as either Sciences or Humanities.

Another study carried out in primary schools will be interesting to find out the performance between extraverts and introverts just before adolescence stage sets in.
REFERENCES


APPENDIX I: RESPONDENTS BACKGROUND INFORMATION SHEET

Fill in the following questionnaire as honestly as possible. You may ask for clarification where you do not understand.

- Name

- Sex: Female [ ]  Male [ ]

- School

- Ordinal Position: 1 2 3 4 5 6 7 8 9 10, only child [ ], last born [ ]

  How many brothers and sisters have you?

- Are you an only child among Boys? [ ]  Girls? [ ]

  State the approximate age difference between you and your immediate follower

- Which type of family structure do you come from?
  (a) Polygamous [ ]  (b) Monogamous [ ]

- With whom do you stay?
  (a) Step Mother,  (b) Grand Mother  (c) Uncle
  (d) Aunt   (e) Own Parents  (f) Brother

- Among the children where you are staying are you the:
  (a) oldest, (b) middle aged or (c) youngest
APPENDIX II: EPQ EYSENCK PERSONALITY QUESTIONNAIRE

Now work through the questions given below putting a circle around 'Yes' or the 'No'. If you find it impossible to decide one way or the other for any reason, put a circle around the '?' . It is best if you work quickly and don't dwell too much on the exact wording of the questions.

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>YES</th>
<th>?</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are you happiest when you get involved in some project that calls for rapid action?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>2. Do you like going out a lot?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>3. Do you like planning things well ahead of time?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>4. Do you sit calmly when you are watching a race or competitive sport?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>5. Do you like to have time to be alone with your thoughts?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>6. Do you become restless when working at something in which there is little action?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>7. Do you often need understanding friends to cheer you up?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>8. Do you quite enjoy in taking risks?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>9. Do you usually make up your mind quickly?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>10. Do you frequently pause just to meditate about things in general?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>11. Are you normally on time for appointments?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>12. Generally, do you prefer reading to meeting people?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>13. Do you lock up your house carefully at night?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>14. Do you often change your interests?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>15. Is your anger quick and short?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>16. Are you fairly talkative when you are with a group of people?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>17. Before making up your mind, do you carefully consider all the advantages &amp; disadvantages?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>18. Does a sentimental film easily move you to tears?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>19. Do you often try to find the underlying motives for the actions of the people?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>20. Can you be fully relied upon?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>21. Are you inclined to be slow and deliberate in your actions?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>22. Do you usually finish your meals faster than other people even though there is no reason to hurry?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>23. Do you often buy things on impulse?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>24. Do you hate being with a crowd who play practical jokes on one another?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td>25. Do you know what you will be doing on your next holiday?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>Question</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>26</td>
<td>Do you seldom stop to analyse your own thoughts and feelings?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Do other people regard you as a very lively person?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Do you like talking to people so much that you never miss a chance of talking to a stranger?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Would you say that your temper is well controlled?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Are you keen about learning things even though they may have no relevance to your everyday life?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Are you so carried away by music that you are usually compelled to conduct or dance in time with it?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Do you enjoy spending long periods by yourself?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Are you relaxed and self confident in the company of other people?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Do you usually think carefully before doing anything?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Do you often forget little things that you are supposed to do?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Are you more distant and reserved than most people?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Are you frequently so lost in thought that you do not notice what is going on around you?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Do you like mixing with lots of other people?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Do you tell your friends what you think is wrong with them?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Are you inclined to rush from one activity to another without pausing for rest?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Do you often find yourself hurrying to get to places even when there is plenty of time?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Do you like to tell jokes and stories to groups of friends?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>When you meet new people, do you very quickly decide whether you like them or not?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Are you usually among the last to stop clapping after the end of a concert or stage performance?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Are you frequently lacking in energy and motivation to do things?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Do you find it easy to discuss intimate and personal matters with other members of your family?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Do you like to lie in bed late in the weekends?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Have you ever been involved as a performer in amateur dramatics or musical groups?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Do you enjoy solving problems even though they have no practical application?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>When you are angry with someone do you wait until you have cooled off before tackling them about the incident?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Can you honestly say that you honour your commitments more than most people?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Do you spontaneously introduce yourself to strangers as social</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>57.</strong> Can you keep an exciting secret for a long period?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>58.</strong> Would you rather spend an evening talking to one interesting member of your own sex than singing and dancing with a large crowd of friends?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>59.</strong> Do you enjoy essays on serious, philosophical subject?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>60.</strong> Would you rather watch sports than play them?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>61.</strong> Would you be very unhappy if you were prevented from making numerous social contacts?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>62.</strong> Do you need to use a lot of self-control to keep out of trouble?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>63.</strong> Are you hesitant to ask strangers for a street direction?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>64.</strong> Do you like to have many social engagements?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>65.</strong> Do you enjoy entertaining people?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>66.</strong> Are you prone to exaggeration and elaboration when relating a story to your friends?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>67.</strong> Do you spend much time reflecting upon the past and the shape that your life is taking?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>68.</strong> Do you get bored more easily than most people doing the same old-things?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>69.</strong> Do you hate standing in a long queue for anything?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>70.</strong> Do you arrive at appointments with plenty of time to spare?</td>
<td>YES</td>
<td>?</td>
<td>NO</td>
</tr>
</tbody>
</table>

**71.** Are you inclined to limit your acquaintances to a select few? | YES | ? | NO