APPLICATION OF DIFFERENTIAL ITEM FUNCTIONING PROCEDURE IN ANALYZING ECONOMICS STUDENTS' ACHIEVEMENT IN SENIOR SCHOOL CERTIFICATE EXAMINATIONS IN NSUKKA EDUCATION ZONE OF ENUGU STATE

BY

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PG/M.ED/16/81205

DEPARTMENT OF SCIENCE EDUCATION
FACULTY OF EDUCATION
UNIVERSITY OF NIGERIA NSUKKA

MARCH, 2020

TITLE PAGE

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A PROJECT SUBMITTED TO THE DEPARTMENT OF SCIENCE EDUCATION, FACULTY OF EDUCATION, UNIVERSITY OF NIGERIA NSUKKA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS DEGREE IN MEASUREMENT AND EVALUATION

SUPERVISOR: PROF. B.C. MADU

MARCH, 2020

CERTIFICATION

Ojobo, Blessing Ngozi, a postgraduate student with registration number PG/M.Ed/16/81205 in the Department of Science Education, has satisfactorily completed the requirements of the research work for the award of the Masters in Education (M.Ed) in Science Education (Measurement and evaluation). The work embodied in this project is original and has not been submitted in part or in full for any other diploma or degree of this university or any other university.

……………………………… ………………………………

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APPROVAL PAGE

This project has been approved for the Department of Science Education, Faculty of Education, University of Nigeria, Nsukka.

By

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DEDICATION

This work is dedicated to the almighty God, the Alpha and Omega.

ACKNOWLEDGEMENTS

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ABSTRACT

The study examined the application of differential item functioning (DIF) procedure in analyzing Economics students' achievement in Senior Secondary School Certificate Examination in Nsukka education zone of Enugu state. Two research questions were posed to guide the conduct of the study. Causal comparative or ex-post facto research design was used for the study. The population for the study comprised 2563 SS3 Economics students comprising 1422 males and 1141 females in the 46 public co-educational senior secondary schools in Nsukka Education Zone of Enugu State. The sample size of 444 Economics students was used for the study. The instrument for the study was 2018 SSCE 50-item multiple choice Economics questions developed by West African Examinations Council (WAEC). To determine the reliability of the instrument, the instrument was administered to 25 Economics students in Nsukka Education Zone of Enugu State who were not part of the study. The responses obtained from the students were subjected to Kudder-Richardson 20 (KR-20) formula to determine the internal consistency of the instrument. A reliability coefficient of 0.89 was obtained. The data collected from the study were analyzed using Logistic Regression procedure. The findings revealed that out of 50 items in 2018 WAEC SSCE Economics questions, 14 items which represents 28% of the test items that displayed significant gender DIF at 0.05 level of significance. Among the 14 items displayed significant gender DIF, only 1 item representing 2% was identified to exhibit significant gender DIF against male students. Out of 50 items in 2018 WAEC SSCE Economics questions, 31 items which represent 62% of the test items displayed significant location DIF at 0.05 level of significance. Among the 31 items, 27 items representing 54% were identified to exhibit significant location DIF against urban students. Based on the findings of the study, it was recommended that DIF analysis should be conducted by test experts and test developers on their test items. This will help to reveal items that exhibit Differential item functioning which could be revised or eliminated in order to produce items that do not exhibit DIF only.

CHAPTER ONE

INTRODUCTION

Background of the Study

Economics is one of the subjects offered by students at senior secondary school level in Nigeria. Economics is the science that deals with production, exchange and consumption of various commodities in economic systems. It shows how scarce resources can be used to increase wealth and human welfare. According to Mankiw (2001), Economics is the study of how society manages its scarce resources. Hence, the central focus of Economics is on scarcity of resources and choices among alternative uses. Similarly, Egunjobi and Egwuakhide (2010) see Economics as the study of human endeavours in respect of production, distribution, exchange and consumption. According to Okafor (2008), Economics as a subject helps the individual to be relevant in everyday life and could prepare students for an entrepreneurial career in the future. The study of Economics enables the leaders as well as the citizens to understand the basic economics concepts, principles as well as to understand, appreciate and seek to improve the economic situation for their own social good (Obemeata as cited in Ikeh, 2016). The definitions and explanation of Economics indicate that Economics is an important subject to both the students and society at large, because it cuts across all spheres of human endeavours.

The objectives of studying Economics in senior secondary school are to enable the students to: (i) understand basic economic principles and concepts as tools for sound economic analysis; (ii) contribute intelligently to discourse on economic reforms and development as they affect or would affect the generality of Nigerians; (iii) understand the structure and functioning of economic institution; (iv) appreciate the role of public policies on national economy; (v) develop the skills and also appreciates the basis for national economic decisions; (vi) become sensitized to participate actively in National Economic advancement through entrepreneurship, capital market and so on; (vii) understand the role and status of Nigeria and other African countries in the international economic relationships; and (viii) appreciate the problems encountered by developing countries in their efforts towards economic advancement (Nigerian Educational Research and Development Council (NERDC), 2008). These objectives of Economics form the bedrock on which all efforts to ensure proper and adequate implementation of the programme goals are based. In classroom setting, the teacher's efforts are to ensure adequate achievement of the set objectives of the lesson content. The extent to which the teacher is able to achieve the goals of any lesson content is a reflection of the degree of achievement by the teacher in attaining the expected change(s) in the behaviours of the learners after instruction (Ugwuja & Igbokwe, 2009). These expected changes in the behaviours of the students are measured using different assessment tools like test.

Test is one of the assessment instruments used in testing or assessing students' academic achievement in any given instruction. Test according to Nworgu (2011) consists of sets of uniform questions or tasks with preferred response(s) to which a student or examinee is to respond independently and the result of which can be treated in such a way as to provide a quantitative comparison of the performances of different students. It is a series of tasks or a set of questions that learners must respond to orally or in writing that makes it possible to examine differences between learners. Tests according to Joshua (2005) are used to gain useful information about test-takers' knowledge, skills and progress; it helps each professional to perform his or her work effectively. They are also used in promotion, placement, selection, certification and decision making. Students, individuals and group of individuals who are tested by standardized or teacher-made tests are known as examinees and in testing, it is expected that examinees of the same latent trait should respond to test item correctly irrespective of their different subgroups (Ogbebor, 2012). This implies that a test has to be fair to all the examinees because a fair test according to Roever (2005) affords all examinees an equal opportunity to demonstrate the skills and knowledge which they have acquired and which are relevant to the test purpose. Most times, no matter the effort, how much time and consideration put in the construction of tests, it may not be perfect (Walker, 2011). This is because they may be susceptible to human errors and on analysis they may be found to be ambiguous, too simple, overly difficult and discriminating. Similarly, because different examination bodies cater for candidates of various backgrounds all over the country, candidates who participate in the examinations conducted by these bodies are in different settings and therefore differently toned for personal and environmental reasons (Igomu & Fan, 2013). As a result of this, the issue of the tests having discriminating properties cannot be ruled out in these examinations given to students at the completion of their senior secondary school.

However, it should be known that at the completion of the senior secondary school education in Nigeria, the West Africa Examination Council (WAEC) and the National Examination Council (NECO) conducts the Senior School Certificate Examination (SSCE) for students (examinees). Their aim is to determine the extent of knowledge acquired by examinees during their secondary school programme as a pre-requisite for entrance or admission into tertiary institutions and as a basis for those seeking employment after their secondary education. The achievement tests which these bodies administer is used to evaluate the academic achievement of students and the scores students obtain are supposed to be representative of the extent to which the subject matter being measured by the tests are understood by the examinees (Amajuoyi, Eme & Udo, 2013). There are features which these examination bodies are known for and they include: to present thousands of candidates for examinations which are based on the existing national curriculum; and to issue result slip, certificates, and diplomas to examinees who have attempted the examinations. They are also to develop tests measuring common skills and bodies of knowledge taught in school without introducing any extraneous variable or characteristics that will favour some groups of candidates to perform better than others (Nwana, 2000).

For these examinations conducted by WAEC and NECO to be adjudged well, it has to posses some qualities which include that the: examination questions and marking schemes should produce scores that are both reliable and valid; conduct of the examination and the published results should be deemed fair and achieve a high level of acceptance by the public. Also, the examination should ensure that no particular candidate or group of candidates has unfair advantage over others (Nwana as cited in Hogan-Bassey 2011). This implies that the tests should not contain items that are biased.

The concept of test item bias is a phenomenon that affects academic achievements. It is the existence of some irrelevant elements present in items that causes differential achievement for individuals of the same ability but from different subgroups (Ogbebor & Onuka, 2013). Consequently, it has been observed that biased tests measure characteristics that are not necessary or relevant to the test and this makes it to function differently for a specified subgroup of test takers (Ogbebor, 2012). Since many items in public examinations are considered biased (Zumbo, 1999) it can be said that they contain sources of difficulty that are not relevant to the construct being measured and these extraneous sources affects the achievement of examinees. When a test yields different scores from subgroups, with the same ability levels, then such a test is said to be biased. This means that it is possible for a test to measure different things in a subject for two students who have the same subject matter ability but belong to different subgroups of the population of test takers. Therefore, a test should be constructed in such a way that even if there are differences in the academic achievements of students, it cannot be attributed to the fact that those students belong to a particular subgroup. These subgroups among others include gender and school location.

Gender is the psychosocial aspect of maleness and femaleness. According to Keightley (2011), gender is concerned with masculinity and femininity as categorized to each sex in the society. It is a range of characteristics used to distinguish between male and female, particularly in the cases of men and women, masculine and feminine attributes assigned to them. In line of the statement, Bronfenbrenner (2005) refers to gender as social differences and relations between men and women. Gender is a social construct, it is not biologically determined but a concept equivalent to race or class (Offorma, 2004). This definition suggests that gender is socially or culturally constructed characteristics and role, which are associated with males and females in the society. According to Lee (2001), gender is ascribed attribute that differentiates feminine from masculine.

Different researches as reported below pointed out that girls usually make external attributions for successes and failures, and that when they make internal attributions, these refer not so much to effort, but to ability. However, boys usually attribute success to stable internal causes like effort, thus showing an attributional pattern which enables them to enhance their own image of self (Smith, Sinclair & Chapman, 2002). The differences in the achievements of males and females are generically attributed to biological cause and / or to culture and stereotypes (kleen, 2004). Some studies (Simkim & Kuechler, 2005; Jiboku 2008) have shown an all-time low performance of women in education. Educators have therefore expended tremendous efforts in the study of the personal factors affecting academic achievement especially in the sciences and social sciences. Eryilimaz (2004) observed that gender contributes in achievement of students in Economics.

However, the issue of gender differences in students' performance in their academics has raised the concern of various researchers. For instance, Orluwene and Otuata (2017) in their study reported that gender significantly influenced the differential effects of objective test formats on students' achievement in Economics. Amuda, Domiya and Durkwa (2016) reported that there was no significant gender difference in the academic performance of students in SSCE, WAEC and NECO in Economics, while SSCE, WAEC and NECO for 2006/2007 session in Economics for 2008 to 2010 sessions showed consistent significant gender difference in the academic performance of students in favour of male students. Contrarily, Okpala (2016) reported no significant difference between male and female senior secondary school students’ achievement in Economics. These inconclusive results and discrepancies in achievements cut across not only gender but also school location.

Location is a particular position, situation or geographical area. According to Orji (2013), school location means urban-rural setting. Urban schools are those schools in the municipalities or schools found within the towns and rural schools are those located in the villages or semi- urban areas. Educational opportunities vary from one location to another. While some places are known to have enough schools with facilities and teachers, other does not. The urban-rural influence is also expected in Economics just like any other social science subject because of the psychological influence it may have on the teachers and students resulting mainly from school location. This may even dictate their academic achievement in social science of which Economics forms a part. Therefore, the area in which a school is located can affect the educational achievement of a student. Alokan (2010) observed that schools in the urban areas are characterized by availability of enough quality teachers, good infrastructure, well equipped library and laboratories, good communication network, serene environment among others while schools in the rural settings are the quite opposite of the conditions available in the urban schools. This disparity in the living and academic conditions of the urban and rural schools consequently affects students academic achievement in Economics.

Students’ achievement in relation to school location is crucial to educationists. There have been different research reports in literature; some agreeing that location affects achievement, while others do not. Location and achievement studies are inconclusive. For instance, a study carried out by Owoeye and Yara (2011) reported that that Economics student from rural areas perform better than their urban counterparts, which implies that school location is not a significant factor in students' academic achievement in Economics. Meanwhile, Adesegun, Adekunle and Adu (2016) reported that school location is a significant factor on students' achievement in Economics. The findings of Onuoha, Ifelunini, Ezeocha and Agah (2017) showed that location is a significant factor affecting students' achievement in Economics.

However, many reasons have been put forward for the causes of the discrepancies recorded in the academic achievement of students from different subgroups in Economics and one of them could be that there are items in the tests that favour or disfavour some examinees from the subgroups (Oche, 2012). Moreover, to determine if a test contains items that are biased in relation to any subgroup, the test is subjected to Differential Item Functioning Procedures.

Differential Item Functioning (DIF) are a statistical technique used to assess the existence of test item bias. Chahine and Childs (2010) is of the view that DIF analysis is typically used to identify test items that are differentially difficult for respondents who have the same level of knowledge, skill, or ability but differ in ways that should be irrelevant to their performance on the test (e.g., females versus males, students in rural versus urban schools, among others). To evaluate whether test items displays differential item functioning, examinees are first separated into reference and focal groups (for example, males versus females, urban versus rural examinees). The reference group is the group expected to perform at a higher ability while the focal group are those that perform at a lower ability (Hogan-Bassey, 2011). McNamara and Roever (2006) described the focal group, as a group of minorities, which is the potentially disadvantaged group while the group which is considered to be potentially advantaged by the test is called the reference group.

There are several methods used to detect if items have DIF effects. Rousons, Schnikpe and Pashley (2000) stated some of these methods to include the Standard Mean Difference (SMD) techniques, Mantel-Haenszel (M-H) procedure; Transform Item Difficulty (TID-45), Scheuneman Modified Chi-square test method (SSX^2). Other methods mentioned are Item Characteristics Curve (ICC) method, Analysis of Variance Methods, Factor Analysis methods and Logistic Regression Analysis procedure. However, for this study, the Logistic Regression Analysis procedure will be used. Apart from the method being the one predisposed to the researcher, the choice of the method also stems from the fact that some researchers have classified the method as one of the major methods of detecting DIF (Pedrajita, 2009; Ogbebor & Onuka, 2012; Amuche & Akpan, 2013). The logistic regression analysis procedure can detect DIF for both dichotomous and polytomous items. In this procedure, the probability of a positive response to an item is modeled as a function of total scores, group and the interaction between total score and group (Zhang, 2015).

There have been studies that investigated the incidence of DIF in items used in public examinations in Nigeria. Madu (2012) carried out a study on analysis of gender-related differential item functioning in mathematics multiple choice items administered by the West African Examinations Council (WAEC) in Nsukka local government of Enugu State Nigeria. The researcher employed the Scheuneman Modified chi-square method. Also, Amuche and Fan (2014) used logistic regression analysis to assess item bias in NECO SSCE Biology conducted examinations in Taraba state, Nigeria and their findings showed that out of 60 items in test, 10 items were biased in relation to school type and 8 items in relation to school location. Similarly, Uruemu and Adams (2013) investigated items bias using differential item functioning approach in relation to school type (private and public schools), school location (urban and rural schools) using National Examinations Council (NECO) SSCE Economics questions for 2010. Their result revealed that out of 60 items in NECO Economics questions 10 items were biased in relation to school type and 8 items in relation to school location. Also, Ogbebor and Onuka (2012) used logistic regression analysis to investigate the NECO SSCE 2010 Economics questions for incidence of DIF in relation to school type and school location in Delta State Nigeria and reported that out of 60 items in NECO economics questions 10 items were biased in relation to school type and 8 items in relation to school location.

It is quite appreciative that some studies have been carried out in Economics using differential item functioning. However, majority of the studies was carried out using SSCE conducted by National Examinations Council (NECO). Additionally, the studies concentrated majorly on school type and location. As a result of these, it is imperative to analyze the academic achievement of students in Economics using Differential Item Functioning procedure (logistic regression analysis procedure) to determine which gender (males or females) and school location (urban or rural), function differentially in the West Africa Examination Council SSCE. Therefore, this study is aimed at applying differential item functioning (DIF) in analysing Economics students' achievement in Senior School Certificate Examination (SSCE) conducted by the West African Examination Council (WAEC) in Enugu State.

Statement of the Problem

In education, test is crucial in determining students' academic achievement. The test could be used for promotion, certification, recruitments, and placement and so on depending on the purpose using a valid and reliable measuring instruments. The qualities of measuring instruments lie mainly on the quality of items used in the instruments. Therefore, the use of test results for major educational decision without DIF evaluation in its complete dimensions is against the global best initiatives in measurement and assessment. Evaluating DIF is one of the expected modern psychometric analyses of bias measures to ensure equality of opportunity to all examinees.

The global concern of measurement evaluators and educators to ensure that items in test and examinations are not only administered to obtain the scores but also to ensure fairness and equality of opportunity to all examinees irrespective of differences in race, gender and socioeconomic backgrounds is receiving great attention in education and other major areas that use test information for major decision making. There is need to ensure that items are not only valid and reliable but also are fair to all, across the subgroup of examinees such as gender (male and female) and school location (urban and rural).

In other words, standardized test items are supposed to be invariant in nature. Tests with differentially functioning items distorts the meaning of test results and the decision that is based on it for some groups. Therefore, the problem of this study is to investigate if there are items in West African Examination Council SSCE Economics multiple choice test items that function differentially with respect to gender and school location among secondary school students in Nsukka Educational Zone of Enugu state.

Purpose of the Study

The purpose of this study is to apply Differential Item Functioning procedure in analysing Economics students' achievement in Senior School Certificate Examinations (2018) in Nsukka Education Zone of Enugu State. Specifically, the study sought to determine whether:

1. WAEC Economics multiple choice test items of the Senior School Certificate Examination function differentially in terms of gender.
2. WAEC Economics multiple choice test items of the Senior School Certificate Examination function differentially in terms of school location.

Significance of the Study

The findings of this study have both theoretical and practical significance. Theoretically, the study is anchored on Classical Test Theory (CTT). Classical Test Theory (CTT) postulates that an observed score (X) is decomposed into a "true" score (T) and a single undifferentiated random error term (E). The findings of this study would hopefully be theoretically useful in the sense that the theoretical information of classical test theory which revealed that each individual has a true score which would be obtained if there were no errors in measurement may be better understood when used in line with this study which investigated the need to ensure that items are not only valid and reliable but also fair to all across the subgroup of examinees like gender (male and female) and school location (urban and rural).

Practically, the findings of this study would be useful to policy makers, school administrators, teachers, curriculum planners and examination bodies like the West Africa Examinations Council (WAEC), Joint Admissions and Matriculation Board (JAMB), National Teachers Institute (NTI), National Examinations Council (NECO) National Business and Technical Education Board (NABTEB). To policy makers and school administrators, the findings of this study would help them in decision making since the test is useful in identifying subgroup or categories of examinees that require additional or more help and support.

Secondary school teachers would benefit from the study since the tests are also used as part of an educational accountability system that assess them. This implies that the absence of differential functioning of students means that they were taught effectively and were of the same ability. In the same view, the result obtained would provide information to Curriculum planners needed to improve instruction and students learning in selected areas of the curriculum in relation to national standards.

Furthermore, to Examination bodies, the findings of this study would help them to write appropriate test that will be devoid of differential functioning items. That is, it will enable them construct test items that will appropriately measure examinees knowledge of the examination items and nothing else. The findings of this study would also help to indicate the overall quality of the Economics questions constructed by WAEC. The study will be beneficiary and focus on gender and school location in Nsukka Education Zone of Enugu State.

Scope of the Study

The study which focuses in applying Differential Item Functioning (DIF) procedure in analysing Economics students' achievement in Senior Secondary School Certificate Examination was carried out in Nsukka Education Zone of Enugu State. The study was restricted to Economics students in the senior secondary school three (SSS 3) because the students have covered the WAEC syllabus from senior secondary school one to senior secondary three (SS1 – SS3) and are ready to write the West African Senior School Certificate Examination (WASSCE). The study made use of 2018 May/June SSCE Economics multiple choice examination scores for the analysis.

Research Questions

The following questions were posed to guide the study;

1. What test items on standardized WAEC 2018 SSCE May/June multiple choice Economics questions function differentially in terms of gender?
2. What test items on standardized WAEC 2018 SSCE May/June multiple choice Economics questions function differentially with respect to school location?

CHAPTER TWO

REVIEW OF LITERATURE

The reviews of related literatures were done under the following sub – headings; conceptual framework, theoretical framework, empirical studies and summary of literature reviewed.

Conceptual Framework

Theoretical Framework

- Item Response Theory
- Classical Test Theory

Related Sub-Themes

- Economics as a School Subject
- Gender
- School Location
- Differential Item Functioning
- Academic Achievement of Students
- Multiple Choice Items

Review of Related Empirical Studies

- Related Studies on Tests and Differential Item Functioning
- Related Studies on Gender and Differential Item Functioning
- Related Studies on School location and Differential Item functioning

Summary of Review of Literature

Conceptual Framework

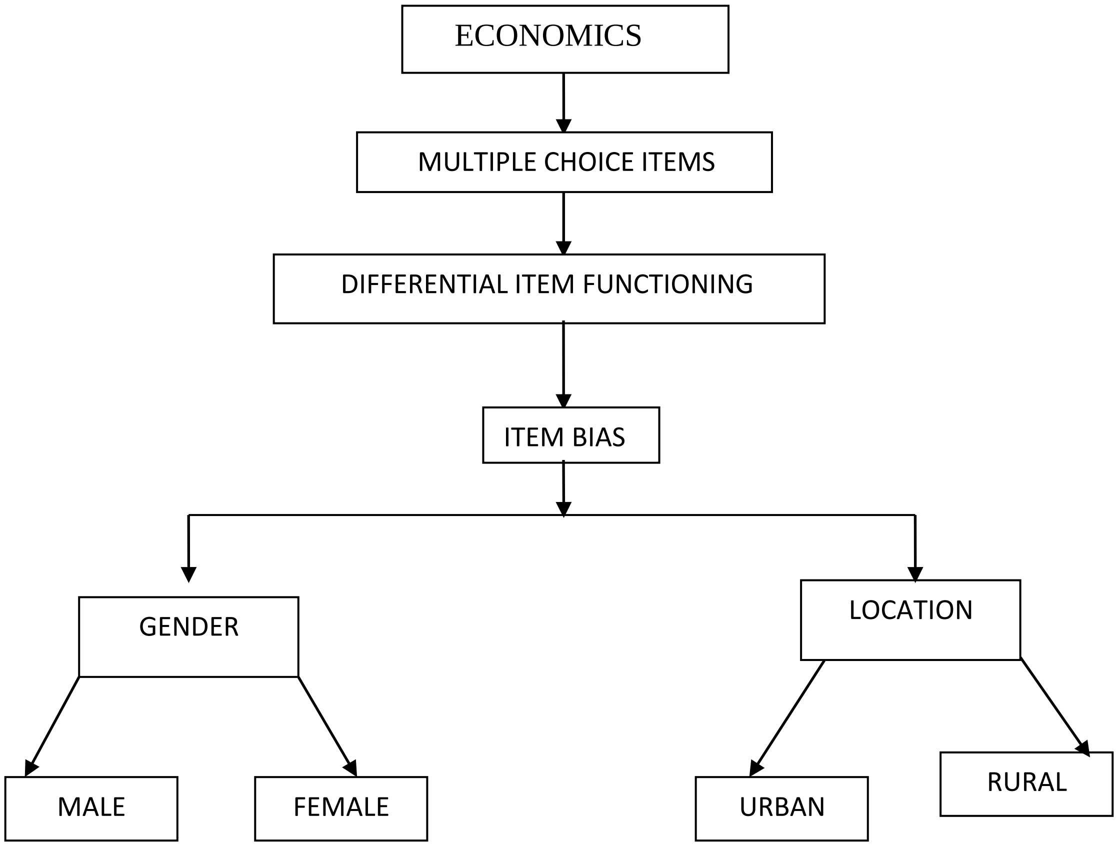

Fig 1: *Schematic diagram showing relationships among the studied variables*

The conceptual framework shows the differential item functioning can be used to detect item bias of Economics multiple choice questions. The major item bias identified in the study is gender and school location. Gender in this case comprises male and female students while school location has to do with schools in the urban and rural areas. Economics multiple choice items were analyzed in order to ascertain students' academic achievement (dependent variable) to determine if there are items that are functioning differentially (DIF) in terms of the independent variables. That is, if WAEC Economics multiple choice items of the Senior School Certificate Examination functions differentially in terms of gender and school location.

Theoretical Framework

Theories have general functions which is the provision of general explanation of a phenomenon. The theories relevant to this study were reviewed under this section. They include Classical Test Theory by Novick (1966) and Item Response Theory (IRT) by Lord and Novick (1980).

Classical Test Theory

The Classical Test Theory (CTT) was propounded by Melvin Novick in 1966. The theory came about when the following three ideas were conceptualised; firstly, the recognition of the presence of errors in measurement, secondly, a conception of that error as a random variable and thirdly, a conception of correlation and how to index it. CTT's major focus is on test level information and it collectively considers a pool of examinees and empirically examines their success rate on an item if the items are dichotomously scored. CTT is based on the assumption that a test-taker has an observed score and a true score. The observed score of a test-taker is usually seen as an estimate of the true scores of that test-taker plus/minus some unobservable measurement error. Classical test theory is based on the true score theory which states that each person has a true score *T* that would be obtained if there were no errors in measurement. Unfo-rtunately, test users never observe a person's true score, only an observed score, *X*. The true score theory is conceptualised thus; observed score (test score) = true score plus error score. Mathematically,

$$\underset{\text{Observed score}}{X} = \underset{\text{True score}}{T} + \underset{\text{Error score}}{E}$$

The true score (T) reflects whether examinees amount of knowledge or ability is the true measurement of the examinee which is always contaminated by random errors. These random errors can result from several factors such as guessing, fatigue or stress. In the analysis of WAEC Economics Examination questions or test items, the researcher will utilize individual statistic, which is the observed true score of each examinee as indicated in the classical test theory to calculate for differential item functioning. This indicates that the study will utilize the response of a person to the whole test items.

Item Response Theory

The Item Response Theory (IRT) was propounded by Lord and Novick in the year 1980. The name item response theory is due to the focus of the theory on the item and it attempts to explain the response of a person to an item. It is a technique that tries to describe the relationship between an examinee's test performance and the latent trait underlying the performance. In its simplest form, item response theory posits that the probability of a random person j with ability θj answering a random item i with difficulty bi correctly is conditioned upon the ability of the person and the difficulty of the item. In other words, if a person has a high ability in a particular field, he or she will probably get an easy item correct. Conversely, if a person has a low ability and the item is difficult, he or she will probably get the item wrong. Moreover, IRT focuses on both item and person statistics.

IRT rests on two basic postulates:

(a) the performance of an examinee on a test item can be predicted (or explained) by a set of factors called traits, latent traits, or abilities; and

(b) The relationship between examinee's item performance and the set of traits underlying item performance can be described by a monotonically increasing function called an item characteristic function or item characteristic curve. This function specifies that as the level of the trait increases, the probability of a correct response increases.

The West African Examinations Council (WAEC) Senior School Certificate Examination is an examination which is subsumed in the measurement theory of IRT. When examinees enter into exam halls, they bring along with them, their ability level (). Public examinations such as the WASSCE measure the relative position of the examinee on the theta

() scale, interprets the examinees data and produce a measurement of ability (achievement) in the form of raw scores. The study utilized the response of examinees on the individual test items and their total test scores to determine if the test items have incidence of Differential Item Functioning (DIF).

Related Sub-Themes

Economics as a School Subject

Economics is taught in the senior secondary schools to allow students to understand today's economic environment. This requires mastering the theory and practicing its application. Just as the study of theory of genetics or information technology is steadily progressing, so the theory of economics continues to make progress, sometimes in dramatic and exciting ways. According to Vasiliki, Martha and Konstantina-Maria (2015), Economics is a social science that studies how individuals, governments, firms and nations make choices on allocating scarce resources to satisfy their unlimited wants. Economics can generally be broken down into: macroeconomics, which concentrates on the behavior of the aggregate economy; and microeconomics, which focuses on individual consumers (Investopedia).

The term economics has been defined by various economists based on their view on the working of the economy as related to consumer behavior. Egunjobi and Egwuakhide (2010) see Economics as the study of human endeavours in respect of production, distribution, exchange and consumption. According to Okafor (2008), Economics as a subject helps the individual to be relevant in everyday life and could prepare students for an entrepreneurial career in the future. Economics, in other words, is the study of allocation and of a social limited or scarce resource among alternative used and the distribution of the society's output among individual and groups. From the definition above, it is seen that today, however, Economics is seen slightly differently from the earlier definitions given by

Robbins (1954), who sees economics to mean the science which studies human behavior as a relationship between ends and scarce means which have alternative uses. Put differently, it is the science that studies the process and institutions whereby the limitless human wants are satiable within the limits imposed by availability of resources which have alternative uses.

Economic issues are ever present and fundamental to understanding. Onwukwe (2007) asserts that the study of economics is based on the fact that while human wants are unlimited, the means of satisfying them are limited in supply. To cope with this very unfortunate situation, man must economize, but cannot accomplish it without teaching and learning economics. Awoke (2011), states that there are several reasons why economics can be studied; for students to be aware of the present-day economic problems both in our country and worldwide. As a surest road to a rewarding career such as banking.

Economics is basically a utilitarian subject and helps us towards our existence in our daily activities. Economics in senior secondary school will help a child do well in other subjects like statistics, mathematics, and commerce among others. According to Egbe (2009), the teaching of economics requires specific skills just as the teaching of other subjects but lack of trained manpower has led to the employment of the untrained teachers to teach the subject in many states of the federation, Enugu state not excluded. According to Ben (2009), Economics is taught in schools to help solve real world problems. For example, the economist Alfred Marshall (1843-1924), was greatly concerned with poverty, which he believes was the root of many social problems. Alfred Marshall hoped that the study of economics would enable the students to better understand the causes of poverty and find a way to alleviate it.

The study of Economics helps to learn about certain ideas that have shaped the world. Furthermore, Obemeata (2015) stated that the position of economics in secondary school curriculum has been strengthened because it has been accepted that it has some civil values because of some topics as "the element and determinants of national income, the structure and activities of labour unions, the working and influence of financial institutions among others. These prepare one adequately for life in modern society. Stressing on the importance of Economics, Orluwene and Otuata (2017) opined that Economics helps the individual to build up a body of economic principles and equip him with the tools necessary for economic analysis of life activities, which will enable him to understand current issues and problems; live effectively and contributes intelligently to discourse on economic reform and development. According to Adu (2007) the study of economics serves a useful purpose in modern life. It gives us facts and shows us what may be expected to be the outcome of certain lines of conduct; it helps us to decide which of several alternatives to choose. It charged its recipient to make wise choice that will satisfy their needs in the presence of unlimited wants and resources.

It is in recognition of the importance accorded to Economics as a subject that it is among one of the compulsory elective subjects to be studied at the Senior Secondary Schools in Nigeria, (Federal Republic of Nigeria, 2004). Economics is very useful in understanding other subjects like History, Sociology, Psychology, etc. Economics is inestimable as economic questions touch everybody at all times. The knowledge of Economics enables one to tackle daily problems as it provides the tools necessary for rational decisions. No wonder Sir Henry Clay in Abedi (2000) opined that the knowledge of Economics is at once a practical necessity and a moral obligation. Economics equips a person with appropriate knowledge needed to formulate theories from which wise decisions can be made. We learn how best to use our limited resources within a minimum waste. It therefore, provides a rational guide to individuals, firms and governments in the allocation of scarce resources. In this study therefore, Differential Item Functioning procedure will be used to analyze

Economics students' achievement in Senior School Certificate Examinations in Nsukka education zone of Enugu State.

Concept of Gender

Gender is a socio-culturally constructed concept of ascribing some characteristics and roles to sex such as male and female within the society. Gender has to do with the subjective feelings of maleness or femaleness. Guez and Allen (2000) argued that one's gender can be determined in many ways, such as behaviour. In most societies, for example, humility, gentleness, submissiveness, and being emotional are considered feminine behaviour and women are expected to behave that way. Men, on the other hand, are expected to be dominant, talkative, aggressive and not emotional. The authors further pointed out other determinants of gender including dress, gestures, occupation, social network, and especially the roles played by the sexes in society. Okeke (2006) explained that gender is socially or culturally constructed characteristics, qualities, behaviours and roles which different societies ascribe to female and males.

Unlike sex which is biological, gender expectations, roles and characteristics of its member are made evident in the approved process of socialization as dictated by the society. Gender relates to the difference in sex (that is, either male or female) and how this quality affects their dispositions and perception toward life and academic activities (Okoh, 2007). In the words of Obasi (2006) gender is also used to discuss social and psychological aspects that are regarded appropriate to men and women. Gender roles are those functions that are culturally allotted to individuals on the basis of their gender but are not related to biological functions. The roles are a set of expectations as to what ought to be appropriate behaviour for men and women under particular circumstances. It is those functions that can be carried out by a man or a woman.

Furthermore, the assignment of such roles varies from culture to culture and over a period of time. For example, child rearing is allocated to women. It is a female gender role but not a female sex role since a man or a woman can carry out the functions. Also, household chores such as washing plates are allocated to women whereas men can also do it. The males clearly dominate both teacher and student-initiated interactions in science classes which Basic science is inclusive (Allele-Williams, 1993). Males dominate the interaction because whenever any question is asked by the teacher without specifying a student, it is the males that would volunteer to attempt an answer to the question. The answer given may not necessarily be correct. However, the important point is that an attempt has been made to answer the question. The activeness of the male students seems to make it possible for them to receive more attention from their teachers than their female counterparts. Their female counterparts on the other hand are expected to be submissive. Gender influences female perceptions towards scientific and technological careers. The image of science is lacking in appealing to females because it is fundamentally masculine and offers an opposition to females' sense of feminity (Mbajiorgu, 2003). Achievement in science is regarded as having a masculine image.

It is not only parents and teachers that regard scientific ambition as inappropriate for females, but females themselves also see participation in science and technology as incompatible with their developing ferminity. Mordi (2004) asserted that males are trained for the superlative role, while the females are trained for the subordinate role. This is because of the relative importance of male child in the family setting; male children are usually preferred to females. But, the conflicting views on the influence of gender on academic achievement in school subjects do not support this idea. Some educationalists are of the view that gender differences observed in students' academic achievement may be attributable to genetic factors (Plomin, DeFries, Knopik & Neiderhiser, 2013). In line with this claim, Okeke (2001) asserted that the constancy of gender differences in achievement across different school subjects and environments provide evidence for the importance of biological rather than environmental factor in determining science achievement especially in Basic Science.

Gender issues and its effects in students‘academic achievement in science has persisted over the years with contradicting results and stands out as a controversial issue in science education due to varying reports from different researchers. Some researchers like Ibe (2004); Iweka (2006); Obiekwe (2008); Kolawole (2007) and Okoro (2011) are of the view that males perform better than females in sciences whereas other educators like Okeke (2007), Nzewi (2010) and Oludipe (2007) are of the view that both males and females achieve equally in science when given equal opportunity and facilities.

From the discussion so far, some scholars have tried to explain this sex differential in achievement between boys and girls in various ways. Many studies have shown gender influence on academic achievement of students in school subjects while some have reported contrary results. The implication of these conflicting results is that educational research studies are yet to arrive at satisfactory conclusion as regards the influence of gender on students' academic achievement. Gallagher (2001) and Wally-Dima and Mbekomize (2013) holds the view that boys and girls display different academic performance in science not only because they differ in their physical, emotional and intellectual development but also due to some social and cultural factors.

These social and cultural factors according to Gallagher (2001) include students' familiarity with subjects, changes of career aspiration, gendered perceptions of specific subjects, ideology of schools, teachers teaching style, the curriculum, presentational styles of boys and girls, teachers' and parental expectations among others. These factors may go a long way in influencing the academic achievement of male and female students in Economics thereby introducing bias. This study therefore, is set to detect gender bias in Economics questions using differential item functioning.

School Location

Location is a geographical place of an area. It can also mean a settlement, whether a village, town or city usually occupied by human beings. According to Ezeudu (2003), school location means urban-rural setting. By school location therefore, it means urban-rural school settings and this classification has influence on educational development. Educational opportunities vary from one location to another. While some places are known to have enough schools with facilities and teachers, other does not. Abidogun (2006) stated that rural areas have greater challenges concerning educational development than the urban centres, due to the peculiar socio-economic and institutional structures of the rural areas.

Some of the challenges, according to Anyaegbu (2003) include: lack of zeal and interest by teachers due to poor and delayed salaries and poor conditions of work; and frequent strike actions by teachers. Based on these, Abidogun (2006) reports that many teachers therefore reject posting into the rural areas while those that do, treat their presence in such area as part time assignment. This situation creates differences in students' achievement. Ezeugwu (2011) opined that differences in school location (urban, semi-urban, rural); differences in method of teaching; differences in number and qualities of the teacher; differences in study habits adopted by the students, all give rise to the differences in achievements of students in various subject areas including. Students' achievement in relation to school location is crucial to educationists.

There have been different research reports in the literature with regards to school location and students' achievement. Some agrees that location affects achievement while others do not. Onah (2011) showed that location is a significant factor in students' achievement in Agriculturd science. Bosede (2010) and Uzoegwu (2004) show that location is not a significant factor in students' achievement. Adepoju (2001) found that students in urban schools manifest more brilliant performance than their rural counterparts. Also, Ogunleye (2002), Ndukwu (2002) and Odinko (2002) reported a significant difference in the achievement of students in urban and semi-urban areas. However, Daramola (as cited in Ogunleye, 2002) did not find any significant difference in the urban and semi-urban schools. In view of these conflicting reports, there is need to carry-out a study with a view to determining WAEC Economics multiple choice items of the Senior School Certificate Examination that function differentially in terms of school location.

Differential Item Functioning (DIF)

Differential Item Functioning is a collection of statistical procedures for detecting differences in group performances as a result of bias items among examinees with similar abilities. It is a systematic error in the predictive or constructs validity of an item that may be attributable to factors irrelevant to the test. Differential Item Functioning (DIF) is said to occur when a group of examinees with similar abilities, taught and examined on the same construct of interest exhibit differing probabilities of responding to items in the test (Camilli, 2006; Osterlind, 2014). Steinberg and Thissen (2006) believed that DIF examines the probability of correctly responding or endorsing an item(s) conditioned on the examinee's ability.

In other words, when a particular group of examinees with respect to social, gender, race or demographic variables respond to a particular item(s) correctly than the other group, the particular item(s) is said to exhibit bias or differential functioning between the groups of examinees. Differential item functioning (DIF) is said to be present in a test item when, despite controls for overall test performance, examinees from different groups have a different probability of answering an item correctly or when examinees from two subpopulations with the same trait level have different expected scores on the same item (Kristjansson, Aylesworth, McDowell & Zumbo, 2005; Penfield & Camilli, 2007).

DIF is used to identify differential item response patterns between groups of examinees such as male and female and this helps in verifying potentially biased test items (Madu, 2012). Bias refers to systematic error in the estimation of a value. A biased test is one that systematically overestimates or underestimates the value of the variable it is intended to assess (Reynolds & Suzuki 2010). Bias according to Scheuneman (1985) is defined as a multifaceted component of observed test scores that, like the usual measurement error, causes an observed score to be different from the "true" score, but, unlike the usual measurement error, is associated with membership in a particular group and, for members of that group, has an expected value other than zero. That is, a biased score is a systematic over or underestimate of ability for members of the group. The kinds of bias that may be encountered in tests ranges widely and they include sex bias, religious bias, geographic bias, linguistic bias and racial ethnic heritage bias. If the test makes the members of one group look worse than their attainment would actually be on the job or in the classroom, the test is said to be biased against that group (Oche, 2012). As noted by Brown, Reynolds and Whitaker (1999), bias is an empirical property of a test, as used with two or more specified groups. Thus, bias is a statistically estimated quantity rather than a principle established through debate and opinion. Test bias is a deviation from examinees' real level of performance. Bias goes by many names and has many characteristics, but it always involves scores that are too low or too high to accurately represent or predict some examinee's skills, abilities, or traits. To show bias, one requires estimates of scores (Reynolds et al, 2010).

One of the implications of test item bias in Nigerian educational system is that it blurs the essence of testing which is to reveal the latent ability of examinees. Test item bias also affects the vital psychometric properties of measurement results in terms of validity and reliability. Test items should be constructed in such a manner that items are free from writing errors such as wordiness, irrelevancy, offensiveness, and excessive stimulations, so that when an inadequacy exists between groups' examination scores, the disparity will be attributed to true differences in whatever the test purports to measure in the examinees

DIF analyses specify whether individuals of equal ability have the same probability of getting a given item correct. According to Igomu and Akpan (2012), the modern approach for detecting item bias is by providing evidence of DIF. Also, Roever (2005) posits that locating items on which a group of examinees perform significantly better than another group is logically the first step in detecting item bias. If there is an item on which a particular subgroup performs significantly better than other subgroups, it is said to have functioned differentially with respect to the two groups. Ogbebor (2012) states that DIF occurs when a test item measures an ability which is unfamiliar to the subject matter, such that students' scores on the item are now sustained by abilities which are unfamiliar to the subject matter.

There are two forms of DIF namely uniform and non-uniform DIF. Uniform DIF is said to apply when there is no interaction between ability level and group membership, or the probability of answering an item correctly is greater for one group uniformly over all ability levels. It occurs when a group performs better than another group on all ability levels. That is, almost all members of a group outperform almost all members of the other group who are at the same ability levels. Non-uniform DIF, on the other hand, is said to apply when an interaction is found between trait level, group assignment, and item responses; or the difference in the probabilities of a correct response for the two groups is not the same at all levels of ability (Luc, 2006).

In any DIF study, there exist at least two groups, the focal and reference groups. The focal group, a group of minorities, for example, is the potentially disadvantaged group. It is a group that is functioning at a lower ability. The group which is considered to be potentially advantaged by the test is called the reference group (McNamara & Roever, 2006). It is the group that is functioning at a higher ability and they serve as standard for comparison. It can be noted however, that naming of the groups is not always clear-cut. That is, the labelling of the groups can be arbitrary (Bachman, 2004).

The general uses of Differential Item Functioning (DIF) are: (1) Fairness and equity in testing: DIF is investigated to know how fair test items are to some group of examinees. When there are items that favour some group of examinees, then that test can be considered as not being a fair test. (2) Dealing with possible threat to external validity: This implies that DIF is often investigated so that one can make group comparisons and rule out measurement artefact as an explanation for the group differences. The group are identified ahead of time and are often driven by the questions the researchers pose (gender difference in Economics performance). (3) DIF helps investigators to understand the cognitive and psychosocial process of item response and test functioning and enable one investigate whether these processes are the same for different group of individuals.

Various methods have been suggested for detecting DIF but no one can be considered either necessary or sufficient (Wiberg, 2009). A researcher wishing to select DIF method is faced with many methods and no clear guidelines for choosing among them. This means that no single method has been found to identify DIF accurately hence researchers should use methods that best suit their study taking into cognizance the situation and circumstances surrounding the study. Some of the methods of detecting DIF are

Logistic Regression Analysis Procedure

The logistic regression analysis procedure for DIF was introduced by Swaminathan and Rogers (1990). It can detect or identify uniform and non-uniform DIF for both dichotomous and polytomous items. For each item, three models with increasing numbers of predictors are used. The probability of a positive response to an item is modelled as a function of total scores, group, and the interaction between total score and group. The item shows DIF if the model fit statistic (-2LogL) is improved when group and interaction are added to the model in order. The group estimate coefficients ($_2$) are associated with uniform DIF while the interaction estimates ($_3$) are related to non-uniform DIF. Like the M-H procedure, responders' values on the trait being measured are represented by their total scores. The models are:

Model 1: logit (p) $= \beta_0+\beta_1\theta$

Model 2: logit (p) $= \beta_0 + \beta_1\theta + \beta_2 Z$

Model 3: logit (p) $= \beta_0 + \beta_1\theta + \beta_2 Z + \beta_3\theta Z$

Where θ denotes the value of the responder on the trait, and Z denotes group membership (e.g. gender or location), and logit (p) denotes the logit of the probability of responders answering positively or correctly. The Likelihood Ratio Test (LRT) is used to compare the likelihood of two models. The model with the smaller -2logL has better fit to the data.

The LRT statistic is calculated by:

G^2 (2inL (model_r)) (2inL (model_f) ~ x^2(d)

Where model_r denotes reduced models and model_f denote full models. G^2 follows the chi-square distribution and d is the difference in numbers of parameter between the reduced and full models. The null hypothesis that item parameters between reference and focal group do not differ. Uniform DIF can be identified by comparing the LRT statistic between Models 1 and 2, with degree of freedom (df) = 1. Non-uniform DIF is tested by comparing Models 2 and 3, with df = 1. An overall test of DIF can be conducted by comparing Models 1 and 3, with df = 2.

Sources: Swaminathan and Rogers (1990) in Zhang (2015).

Transformed Item Difficulty (TID-45) Method

According to Joshua (2005), the transformed item difficulty (TID-45) method is one of the tools used by researchers to detect DIF. This method is based on Item Response Theory (IRT) model in which the probability of a correct response is related to person and item covariates. These covariates often are person and item indicators (Dummy covariates) weighted with parameters that are called ability and difficulty respectively. The method involves computing of P-value (proportion of examinees getting the item right) for each item separately for each group. Using tables of the standardized normal distribution, the normal deviate Z is obtained corresponding to the (IP) the percentile of the distribution. This means that Z is the tabled value having proportion (IP) of the normal distribution below it. Then to eliminate negative Z values, a delta () value is obtained from the Z value by the equation = 4Z + 13. A large delta value indicates a difficult item. For two groups there will be a pair of delta values for each item. These pairs of delta values can then be plotted on a graph. A line can be fitted to the plot of points; and the deviation of a given point from the line is taken as measure of that items bias, large deviation indicating much bias (Subkoviak, Mark, Ironson and Crag as cited in Joshua, 2005).

Generalized Mantel-Haenszel Procedure

This is a procedure developed by Mantel and Haenszel in the year 1959. It was then adopted and popularized by Holland and Thayer in the year 1988 for DIF Analysis. It is usually used to detect uniform DIF for dichotomous items (Zhang, 2015). The M-H DIF procedure compares dichotomous item performance between two groups after matching responders on overall scores. Responders in the focal and reference groups were matched on total test or questionnaire scores by dividing responders in both groups into defined strata on those scores. The total scores were generated by summing item scores across all items.

The M-H procedure is a chi-squared contingency table based approach which examines differences between the reference and focal groups on all items of the test, one by one (Marasculio & Slaughter, 1981). The ability continuum, defined by total test scores, is divided into *k* intervals which then serve as the basis for matching members of both groups (Holland & Thayer, 1988). A 2 x 2 contingency table is used at each interval of *k* comparing both groups on an individual item. The rows of the contingency table correspond to group membership (reference or focal) while the columns correspond to correct or incorrect responses.

ITEM OF INTEREST			
Group	Correct (1)	Incorrect (0)	Total
Reference	A_k	B_k	A_k+B_k
Focal	C_k	D_k	C_k+D_k
Total	A_k+C_k	B_k+D_k	$A_k+B_k+C_k+D_k$

Table 1: Presents the general form for a single item at the *k*th ability interval.

From the table, A, B, C and D correspond to observed cell frequency. Subscript k corresponds to the ability level. Data from the contingency table is used to obtain an odds ratio for the two groups on the item of interest at a particular *k* interval. This is expressed in terms of *p* and *q* where *p* represents the proportion correct and *q* the proportion incorrect for both the reference (R) and focal (F) groups. For the M-H procedure, the obtained odds ratio is represented by $\boldsymbol{\alpha}$ with possible value ranging from 0 to ∞. A value of 1.0 indicates an absence of DIF and thus similar performance by both groups. Values greater than 1.0 suggest that the reference group outperformed or found the item less difficult than the focal group. On the other hand, when the obtained value is less than 1.0, this is an indication that the item was less difficult for the focal group (Millsap & Everson, 1993). Using variables from the contingency table above, the calculation is as follows:

$$\alpha = \frac{[PRK/QRK]}{[PFK/QFK]}$$

$$= \frac{[A_K/[A_K+B_K]]/[B_K/[A_K+B_K]]}{[C_K/[C_K+D_K]]/[D_K/[C_K+D_K]]}$$

$$= \frac{[A_K+B_K]}{[C_K+D_K]}$$

$$= \frac{A_K D_K}{B_K C_K}$$

The above computation pertains to an individual item at a single ability interval. The populations estimate **α** can be extended to reflect a common odds ratio across all ability intervals *k* for a specific item. The common odds ratio estimator is denoted by $\boldsymbol{\alpha_{MH}}$ and can be computed by the following equation:

$$\alpha_{MH} = \frac{\Sigma[A_K D_K / N_K]}{\Sigma[B_K C_K / N_K]}$$

for all values of *k* and where N_k represents the total sample size at the *kth* interval. The obtained α_{MH} is often standardized through log transformation, centring on the value around 0 (Dorans & Holland 1993). The new transformed estimator $MH_{D\text{-}DIF}$ is computed as follows:

$MH_{D\text{-}DIF} = -2.35\ln\alpha_{MH.}$

This is the M-H delta and the M-H delta according to Holland and Thayer (1988) is simply the transformation of the M-H alpha statistic to obtain a measure of bias expressed in terms of differences on the Educational Testing Service (ETS) delta scale. The M-H delta indicates the average amount by which test takers in the focal group found the items in question more difficult than did a comparable test taker in the reference group. In checking for the hypotheses, Camilli and William (1984) is of the view that an item shall be considered biased or function differentially if the absolute value of the M-H delta exceeds 1.5

Scheuneman's Modified Chi – square Method (SSX^2)

Scheuneman (1985) is of the view that an item is unbiased if for all persons of equal ability, the probability of a correct response is the same regardless of group membership. With this method, each comparative group is divided into various groups based on the ability level on the basis of observed total test scores. The p-value for each score group is then computed for comparison using the chi-square X^2 statistics. This procedure entails testing each item separately for bias (Hogan-Bassey, 2011). The first step in this method involves grouping the testees into score intervals. According to Scheuneman, four or five intervals can be created. The factors that determine number of intervals are: difficulty of items, length of the test and size of the sample. The number of testees that fall within each score interval for the two groups (reference and focal testes) is determined with a total across groups for each interval. The number with item correct (observed frequencies) for the two groups in each interval is determined. This is followed by computation of the proportion correct by dividing observed frequency for each score interval by the total number of testes in each score interval. Expected frequency for each group within a given score interval is obtained by multiplying proportion correct (p) for the score interval by the number in each group (reference or focal) who scored within that range. Having determined the observed and expected frequencies, the chi-square is calculated. The degree of freedom for this procedure is (K-1) (r-1) where k is the number of the groups (male and female groups), and r is the number of score groups formed. This is symbolically represented as

$$\chi^2 = \Sigma \frac{[M_e - M_o]^2}{M_e} + \Sigma \frac{[F_e - F_o]^2}{F_e}$$

Where,

M_o = observed frequency of males with item correct

M_e = expected frequency of males with item correct

F_o = Observed frequency of females with item correct

F_e = expected frequency of females with item correct (Madu, 2012).

In this study, the Logistic Regression Analysis procedure will be used to determine the differential nature of the 2018 WAEC SSCE Economics multiple choice items.

Academic Achievement of Students

Achievement is accomplishment, attainment, completion, fulfilment, performance or realization. It is something that somebody has succeeded in doing usually with effort. Achievement simply put is accomplishing whatever goals one set for oneself. The term achievement has been variously defined by authors. For instance, Davinson (2004) sees achievement as a measure of quality and quantity of success one has in the mastery of knowledge, skills or understanding. It is also the attainment of a standard of excellence, (Umeano & Adimora, 2010). Achievement according to Enyi (2004) refers to the degree of success reached or attained in some specific area. In order words achievement is the extent of success attained by an individual. According to Eze (2009), achievement could be referred to as something very good or difficult which was carried out successfully. Ajah (2004) regarded achievement as a change in behaviour exhibited at the end of a given period of time or within a given range of time. Achievement has also been described by Aniekwe (2006) as something which has been accomplished successfully especially by means of exertion, skills, practice or perseverance. Aniekwe (2006) sees achievement as a test for the measurement and accomplishment of skills in various field of academic study. Also describing achievement, Nwagu (1992) described achievement as a systematic and purposeful quantification of learning outcome. Nwagu further explained that achievement involves the determination of the degree of attainment of individual in task, courses or programme of which the individual were sufficiently exposed. Osa-Edoh and Iyamu (2012) observed that achievement is setting a goal, either financial or the accomplishment of learning a difficult skill, or improving ones' health and through hard work, accomplishing the desired goal. Achievement in the area of academic is what is referred to as academic achievement usually assessed with achievement test.

Academic achievement, therefore, could be referred to as the degree of success reached or attained by an individual in some general or specific academic area which is measurable. Academic achievement is a mark of success for both pupils and teachers. It is commonly measured by examination or continuous assessment. As stated by Scales and Roehlkepartan (2003) academic achievement in the school system is the overall performance of students in the school; it is measured within the term and at the end of school session. Kyoshaba (2005) opined that schools are established with the aim of imparting knowledge and skills to those who go through them and behind all these is the idea of enhancing good academic achievement. Over the years, Parents, teachers, counsellors among others; have expressed considerable concern over the deteriorating pupils' achievement in schools. Aremu (2002) stressed that academic failure is not only frustrating to the children and the parents, its effects are equally grave on the society in terms of dearth of manpower in all spheres of economy and politics.

Students, teachers, parent and society at large are concerned about the academic achievement of students. For this reason, Enyi (2004) outlined the following purposes of academic achievement;

i. It is used to determine the relative effectiveness of the programme (teaching/learning) in terms of students behavioural output

ii. It provides the educational administrators with adequate information about teachers' effectiveness and school need.

iii. It helps the school administrators to make reliable decisions about educational planning.

iv. It is used to predict the general trend in the development of the teaching-learning process

v.It is used to encourage students to develop a sense of discipline and systematic study habit.

Academic achievement helps to motivate students to learn more as they discover their progress or lack of progress in a given task. Academic achievement for the purpose of this study refers to the scores obtained by students in Economics achievement test. However, in this study, Economics achievement test will be used to measure SS III students' knowledge of Economics in senior secondary schools which was used in determining the Differential Item Functioning of Economics students' achievement in Senior School Certificate Examinations in Nsukka education zone of Enugu State.

Multiple Choice Items

A standard multiple-choice test item consists of two basic parts: a problem (stem) and a list of suggested solutions (alternatives). The stem may be in the form of either a question or an incomplete statement, and the list of alternatives contains one correct or best alternative (answer) and a number of incorrect or inferior alternatives (distracters) (Burton, Sudweeks, Merrill & Wood 1991). The purpose of the distracters is to appear as plausible solutions to the problem for those students who have not achieved the objective being measured by the test item. Conversely, the distracters must appear as implausible solutions for those students who have achieved the objective. Only the answer should appear plausible to these students (Cheung & Bucat, 2002). There are tips in constructing multiple choice items as described by Haladyna and Downing as cited in Nwaghaluke (2017). They include;

i. List the alternatives vertically and in a logical order. Students who know the correct answer can quickly find it. Also, a jumbled order can be distracting to some students.

ii. Make the question as direct and clear as possible. Questions can degenerate into a test of logic if you use double negatives and complex structures.

iii. Make sure there is only one unambiguously correct response.

iv. Create plausible distracters that would sound right to an incompetent student but are clearly wrong. You can include common misconceptions, common mistakes, and technical jargon to make distracters more effective.

v. Instruct students to choose the “best answer” rather than “the correct answer.” This helps avoid arguments and allows you to skip specifying rounding conventions.

Multiple choice items have many advantages which includes;

i. Multiple choice items can be used to assess a variety of learning outcomes, from simple recall of facts to Bloom’s highest taxonomic level of cognitive skills which is evaluation. It can be used to determine the student’s ability to analyze phenomena, apply principles to new situations, comprehend concepts and principles, discriminate between fact and opinion, interpret cause and effect relationships, judge the relevance of information, and make inferences from given data

ii. Because a large number of multiple-choice questions can be developed for a given content area, it is possible to have a broad coverage of concepts that can be tested consistently.

iii. It allows for test validity in the sense that a student is able to answer many multiple-choice items in the time it would take to answer a single essay question. Consequently, the test scores will likely be more representative of the students’ overall achievement in the course.

iv. There is reliability in its scoring. The scoring of multiple-choice items is more clear-cut than short answer test item scoring because there are no misspelled or partial answers to deal with. Since multiple-choice items are objectively scored, they are not affected by scorer inconsistencies as are essay questions and they are essentially immune to the influence of bluffing and writing ability factors, both of which can lower the reliability of essay tests.

Among the numerous advantages of multiple-choice items, it has the following limitations which includes;

i. Since the student selects a response from a list of alternatives rather than supplying or constructing a response, multiple-choice test items are not adaptable to measuring certain learning outcomes, such as the student's ability to articulate explanations, display thought processes, furnish information, organize personal thoughts, produce original ideas and provide examples

ii. Also good multiple-choice test items are generally more difficult and time-consuming to write than other types of test items. Coming up with plausible distracters requires a certain amount of skill. It is therefore important in this study to detect if gender and school location will pose a bias in Economics multiple choice questions using DIF procedure.

Review of Related Empirical Studies

A number of studies have attempted to investigate on the variables under study. This section therefore, dealt with the empirical studies carried out on the variables concerned in this study, which include related studies on differential item functioning, gender and school location.

Related Studies on Differential Item Functioning

Amuche and Akpan (2013) investigated item bias using Differential Item Functioning technique in NECO Biology conducted examinations in Taraba state, Nigeria. The study investigated items that are biased in relation to school type. The research design employed was a comparative research design. The population for the study comprised all students in Taraba state, Nigeria who enrolled for the Senior School Certificate Examination in 2012. Four hundred and thirty-two (432) SS3 students from (13) secondary schools made up the sample size. The NECO biology objective questions for 2012 were used as the instrument for collecting data whereas the logistic regression analysis was used to analyze the data obtained.

The research findings showed that there were DIF in 10 items out of the 60 items in NECO Biology objective questions. Six (6) items favoured students from the private schools while four (items) favoured students from the public schools. The study is related to the present study in the sense that both studies employed Differential Item Functioning technique in detecting item bias. However, the reviewed study is different from the present study in some ways. Firstly, it investigated DIF with respect to school type (public and private schools) while the present study focused on gender and school location. Secondly, the reviewed study investigated DIF in NECO biology SSCE while the present study used Economics SSCE. Also, the area of study adopted is different from this study.

Similarly, Odili (2004) investigated the effect of language manipulation on differential item functioning of biology multiple choice tests, of WAEC SSCE used in 1999, 2000 and 2001 in Delta State Nigeria. The population for the study was senior secondary three (SS3) biology students in public secondary schools which comprised of 30,437 male and female students. Two types of design were used for the study. A descriptive survey design was employed to obtain data on students' response pattern on the biology objective tests items. A posttest only control group experimental design was used to collect data from students to test the effect of language manipulation on reduction of differential item functioning on biology test form B. The sample for the survey study was 3,300 students which is 10.8% of the population while for the sample size for the experimental study was 1,025 students, which is 3.4% of the population. To guide the investigation, five research questions and twelve hypotheses were formulated and tested. The instruments of data collection were: Biology paper 2 objective test used by WAEC in 1999, 2000 and 2001 examinations; Biology form A test made up of 30 test items that were identified as differentially functioning; Biology form B test which was made up of the 30 items in form A, but presented in simplified language format. The fourth instrument was student's socio-economic status questionnaire that was used to collect students' biographical information. Reliability of the test was established using the Kuder - Richardson method. A value of 0.65, 0.63 and 0.64 was obtained for test papers used in 1999, 2000 and 2001 examination year respectively. Kuder-Richardson method was used to establish reliability for both form A and B of the biology test. A value of 0.56 was obtained for form A, while 0.65 was obtained for form B. Scheuneman modified chi-square statistic was used to analyze students' response pattern with a view to isolating test items that differentially functioned. Dependent t-test statistic was used to test the significance of the difference in the mean value of differential item functioning index in test form A and B. This was carried out at the 0.05 level of significance. Analysis of students' responses to biology multiple choice test items used in WAEC SSCE in 1999, 2000 and 2001 showed that the tests contain items that significantly function differently for examinees from different socio-economic status, and from different location. In 1999 Biology SSCE multiple choice test, 10 items out of the 60 items functioned differentially for examinees from high and low socio-economic status (SES). It was also discovered in the same study that none of the items in the tests used in the year 2000 differentially functioned for the same group of examinees while only one item functioned differentially in the test items used in the 2001 examinations. Also, 8 items in 1999, 2 items in 2000 and 3 items in 2001 WAEC SSSCE exams differentially functioned significantly for examinees based on gender.

The study above is similar with the present study in the sense that both studies sought to detect DIF in terms of gender and school location. Moreover, the research designs, population, area of study, DIF procedure employed, instrument of data collection are not the same.

Ogbebor and Onuka (2012) conducted a study on differential item functioning method as an item bias indicator. The study investigated items that are bias using differential item functioning approach in relation to school type (private and public schools), school location (urban and rural schools) using National Examinations Council (NECO) economics questions for 2010. The research design employed in the study was a comparative research type of design. The population comprised of all students in SSS 3 in Delta State, Nigeria who enrolled for the Senior School Certificate Examination in 2012. Four hundred and forty-seven (447) students from thirteen secondary schools were used as the sample for the study. The instrument for data collection was the 2010 NECO economics objective questions made up of 60 items. Logistic regression analysis was used to analyze the data. The research findings showed that out of sixty items in NECO economics questions, 10 items were biased in relation to school type. Six items favoured the private school students while four items favoured the students from public schools. Also, eight (8) items in relation to school location functioned differentially. The study is of immense benefit to the present study since it detected DIF in NECO SSCE economics based on school location. The study also employed the comparative type of research design and analysed the data obtained using the Logistic Regression Analysis procedure. However, it differs from the present study by investigating DIF in relation to school type. Also, the study investigated bias as regards Economics SSCE and employed a different area of study. Thus, this study is imperative in this regard.

Pedrajita (2009) carried out a study on the use of contingency table approaches in differential item functioning analysis. The study was a descriptive-comparative research design. It investigated differential item functioning in 50 test items of 200 junior high school students on a Chemistry achievement test. The researcher investigated whether the items show DIF in terms of school ownership (public and private). He used hundred students from the public school and hundred students from the private school. The researcher employed four DIF statistical techniques which are the Chi-Square analysis, Distractor Response Analysis, Logistic Regression and the Mantel-Haenszel statistic. The Chi-Square analysis identified 13 items indicating DIF between the public and private school examinees. Nine of which, were pointing bias against the private school examinees whereas, four items were showing bias against the public-school examinees. The Distractor Response analysis revealed 18 items which indicate DIF between the public and private school examinees. Twelve of the items were showing bias against the private school examinees whereas, six, were indicating bias against the public-school examinees. Also, the Logistic Regression analysis identified 22 items which indicate DIF between the public and the private school examinees. Eleven items were potentially biased against the private school examinees. In each of these items, the odds of getting an item right favoured the public-school examinees whereas, the other eleven items, indicated bias against the public-school examinees. The Mantel-Haenszel analysis showed that 22 of the 50 items displayed DIF. Of these 22 items, ten favoured the public-school examinees whereas; twelve items favoured the private school examinees.

The above study is similar to the present study because the researcher among other methods used the Logistic Regression Analysis procedure of investigating DIF. It should be known that differences abound in the two studies in some ways. Firstly, the study used three additional DIF statistical technique and they are the Chi-square analysis, Distractor response analysis and Mantel-Haenszel procedure while the present study will employ only Logistic Regression Analysis procedure. Secondly, the reviewed study investigated DIF in chemistry achievement test with respect to school ownership. Thus, this present study is necessary.

Enunwah, Akwa and Okon (2014) carried out a study and estimated the differential item and group functions of secondary school student's achievement in mathematics. Two research questions and two null hypotheses guided the study. A total of 31,129 SS 3 students in Cross River state public and private secondary schools for the 2010/2011 session constituted the population. A sample of 1,557 students selected through stratified proportionate random sampling technique was used for the study. A 50 item Standardized instrument captioned Multiple-Choice Test in Algebraic Processes (MCTAPIM) based on SS mathematics curriculum was used. The research questions were answered using descriptive statistics, while the hypotheses were tested at 5% levels of significance using the lord's Chi-Square and Student- t -test statistics. All these statistics were generated by the IRT software WINSTEPS 3.17 version by Linacre (2011). The results from the study revealed that seven of the items and one of the nine topics (variations) were significantly biased against school ownership types. The reviewed and the present study are related because both studies are interested in investigating the differential item functioning. Whereas the reviewed study was on mathematics focusing on school ownership type, the present study is on Economics focusing on gender and school location.

Studies on Gender and Differential Item Functioning

Omorogiuwa and Iro-Aghedo (2016) investigate the differential item functioning (DIF) by gender in National Business and Technical Examinations Board (NABTEB) 2015 Mathematics Multiple Choice Test Items (Dichotomous) Examination in Nigeria. This was conducted by determining the items that functioned differentially by male and female examinees. A survey research design was employed. A sample of 17,815 examinee responses was selected from two states each from two geo-political zones out of 63,584 examinee responses from the six geo-political zones in Nigeria. This comprised 11,873 male and 5,942 female examinees. A 50-item multiple choice Mathematics test item was used to gather data. To detect the items that functioned differentially by male and female examinees, Area Index (Raju) method which is one of the item response theory methods of DIF detection was applied. The results of the analysis revealed that male and female examinees functioned differentially in seventeen items (34%) and no difference in 33 items (66%). Out of the seventeen items, six items were in favour of male students while 11 items were in favour of the female students. Omorogiuwa and Iro-Aghedo's study relate to the present study in the sense that both studies are interested in DIF. However, the reviewed study focused on only gender while the present study is focused on both gender and school location using different subjects.

Aina and Akintunde (2013) investigated gender performance in physics in colleges of education in Nigeria. The study was a descriptive survey study and it was carried out in four Colleges of Education in Kwara state, Nigeria. The study had two research questions and a hypothesis which was tested at the 0.05 level of significance. One hundred students were sampled for the study and the Pearson Product Moment Correrational Coefficient, frequency counts and percentages were used to analyze the data collected. The scores of students in physics from year one to year three in the four colleges of education were collected and used for the analysis. The findings of the study indicated that males perform better than females in physics. This study has similarities with the present study in the sense that it investigated gender performances in physics. However, the researcher analyzed the scores obtained using Pearson product moment co-relational coefficient and did not subject the scores to any DIF statistic. Also, the study used the descriptive survey study instead of the causal comparative design in order to offer a gender-based comparison. This shows why the present study is necessary.

In another study, Akala (2010) investigated gender differences in students' achievement in chemistry in secondary schools of Kakamega district, Kenya. The design of the study was a cross-sectional descriptive survey and there were three research questions. Sixty-two (62) public secondary schools in Kakamega district Kenya comprised the population of the study and a total of three hundred and eighty-six (386) students from twelve (12) public secondary schools were used as sample. The students responded to a five-item chemistry achievement test (CHAT) comprising descriptive, mathematical and spatial ability items. A reliability coefficient of 0.08 was obtained for the instrument whereas the Pearson product moment and the t – test was used to analyze the data obtained. The findings of the study showed that gender was associated with chemistry achievement; thus, boys performed better than girls. This study mirrors the present study by investigating gender differences in achievement. However, the research design, population, area of study, instrument for data collection, method of data analysis is totally different from the present work. Therefore, the present work is indispensable.

Also, Maliki, Ngban and Ibu (2009) analyzed gender-based students' performance in junior school mathematics examination in Bayelsa state, Nigeria. The sample size for the study was six hundred (600) students drawn from a population of twelve thousand four hundred and thirty-six (12,436) students who sat for the JSCE mathematics examination in Bayelsa state, Nigeria in 2006. The instrument used to collect data was the 2006 JSCE mathematics objective paper and the data was analyzed using mean and standard deviation. The findings of the study showed that males perform better than their female counterparts in the examination. This study has similarities with the present study in the sense that it analyzed gender-based students' performance. The two studies are not the same in the area of data analysis. The responses of students to the items were not subjected to a differential statistic. Also, the instrument for collecting data is not the same and the area of the study which is Bayelsa state is different from the present study which is Nsukka educational zone of Enugu state. Therefore, the present study is imperative.

In another study by Dania and Femi (2015) aimed at investigating the influence of subject combination and gender on the achievement of physics students in physics at the Nigeria Certificate in Education (NCE) Level. The research design adopted was the causal-comparative. The results of 2009/2010 physics students' sectional performance across the various physics subject combinations were considered. A total of 119 physics students' result across the subject combinations and levels of the Federal College of Education, Kontagora were used for the study. Two research questions and two hypotheses guided the study. The one way Analysis of Variance (ANOVA) and t-test were used to analyze the data (students' results) collected. The findings revealed that gender is not a determinant of students' academic performance in physics. The study of Diana and Femi is of relevance to the present study in some aspects. Firstly, both used the same research design (causal comparative). Secondly, the studies investigated gender differences in academic achievements in physics. However, the studies are not the same in some aspects. The aspects include the area of study, instrument for data collection and method of data analysis. It can be noted that the above researchers did not subject the data they obtained to any DIF statistic. This implies that the present study is inevitable.

Obinne and Amali (2013) conducted a study on differential item functioning; the implication for educational testing in Nigeria. The study investigated the differential item functioning of biology examination test items administered by the West African Examination Council (WAEC) and the National Examinations Council (NECO) for the years 2000 and 2001 in Benue State. The design for the study was the instrumentation research design. The study had two research questions and a hypothesis which was tested at the 0.05 level of significance. The population of the study comprised all SSS3 students who enrolled for the May/June/July 2006 biology SSCE of WAEC and NECO in Benue State. The sample for the study was made up of 1800 students. The instruments used to collect data were the WAEC and NECO 2000 - 2001 biology objective questions which were made up of 60 items. The Transformed Item Difficulty technique was used to analyze the data obtained. The findings of the study indicated that items from WAEC biology examinations have incidence of DIF which favoured boys over girls. Also, there was no incidence of DIF in the NECO biology examinations. This study differs in some ways to the present work. There are differences in the research design, area of study, instrument for data collection, and method of data analysis.

This study used the transformed item difficulty while the present study used the Logistic Regression Analysis procedure in analysing the data obtained. This study also investigated DIF in biology SSCE while the present study will investigate DIF in physics SSCE. The similarity in the study comes in the aspect that both studies investigated gender related DIF. The two studies are not similar, which necessitated the present study.

In the same vein, Pedrajita (2009) employed a descriptive-comparative research design to investigate differential item functioning in fifty (50) test items of 200 junior high school students on a chemistry achievement test. The researcher investigated whether the items show DIF based on gender. One hundred male and one hundred female students were used for the study. Four statistical techniques were used for analyzing the data obtained and they are the Chi-Square analysis, Distractor Response Analysis, Logistic Regression and the Mantel-Haenszel Statistic. Findings from the study showed that the chi-square analysis reveals that only one item, item 17, was found indicating bias between the male and the female examinees in favour of the male examinees. The Distractor Response Analysis showed 2 items indicating bias between the male and the female examinees. The Logistic Regression analysis and Mantel Heanszel analysis conducted identified seven (7) out of the fifty (50) items which indicated bias between the male and the female examinees. Three of these items were showing bias against the female examinees, whereas four (4) items were indicating bias against the male examinees. These items favoured the female examinees.

It should be known that differences abound in both the above study and the present study in some ways. Firstly, the study used four DIF statistical technique and they are the Chi-square analysis, Mantel-Haenszel procedure, Distractor response analysis and Logistic regression analysis while the present study employed one. Secondly, the study investigated DIF in chemistry achievement test while the present study is in Economics. The above study is similar to the present study because the researcher used the Logistic Regression Analysis procedure of DIF analysis and also investigated gender related differential item functioning. Thus, the studies are not the same; therefore, this present study is necessary.

Madu (2012) also carried out a study on Analysis of gender-related differential item functioning in mathematics multiple choice items administered by the West African Examinations Council (WAEC). The study was carried out in Nsukka Local Government Area of Enugu State using the responses of secondary school students who sat for June/July 2009 examination in Mathematics conducted by WAEC. Data were obtained from responses of 1671 students in 50 multiple-choice test items from 12 senior secondary schools and analyzed using the Scheuneman Modified Chi-square method. He found out that 39 items in the mathematics test were identified as significantly exhibiting differential item functioning between male and female examinees at the 0.05 level of significance while 11 items do not differential function between male and female examinees. The results also indicate that out of 50 test items set by WAEC male and female examinees perform differently in 39 items and none in 11 items. Madu's study has relevance to the present study in the aspect of investigating gender related DIF in WASSCE though it is in mathematics. The two studies employed the same design (comparative research design) and it differs in the area of study, population of the study, method of DIF statistic procedure used and the subjects the studies are anchored on.

Furthermore, Umoinyang, Ndifon and Idiku (2014) assessed gender based differential item functioning of 2010 Junior Secondary School Mathematics Examination in southern Educational zone of Cross River State, Nigeria. The research design for this study is the inferential survey and three hypotheses were formulated for the study at 0.05 level of significance. The population of the study comprised eleven thousand eight hundred and eleven (11,811) Junior Secondary School three (JSS3) students from one hundred and eighty-four secondary schools in the Southern Educational Zone of Cross River State who sat for the

2010 Junior Secondary School Certificate Examination. One thousand eight hundred and thirty-three (1833) students were studied and two DIF detection methods (Mantel-Haenszel and Scheuneman statistics) were employed. The instrument used for the study was the multiple-choice items of the JSS3 mathematics examination which contains 60 items. The findings show that none of the detection method identified items that function differentially between males and females.

The above study should have adopted the causal comparative or ex-post facto research design instead of the inferential survey. This is because the researcher did not manipulate any of the variables but engaged in gender comparison. The areas of study, instrument for data collection and the DIF statistic employed differs. Moreover, the study has relevance to the present one because it investigated gender based differential item functioning.

Furthermore, Abedlaziz, Ismail and Hussin (2011) investigated gender related DIF in mathematics ability test of grade 10 students in Jordan. The comparative research design was used and 3 research questions guided the study. Eight hundred (800) male and female grade 10 students in Jordan made up the sample of the study. The instrument used to collect data was the mathematics ability test which comprised of 30 multiple choice items. The obtained data was analyzed using the logistic regression and the transformed item difficulty methods of DIF detection. The logistic regression analysis identified seventeen (17) items showing DIF. Eleven (11) were in favour of the males while six (6) where in favour of the females. Also, the Transformed Item Difficulty (TID) flagged ten (10) items as showing DIF. One (1) item favoured the females while nine (9) items favoured the males. The above study is similar to the present study because it investigated gender related DIF and made use of the Logistic Regression Analysis Procedure. However, the above study employed another DIF statistic which is the Transformed Item Difficulty and the area of study, instrument for data collection, is different. Also, the above study did not investigate location based DIF, implying that the two studies are different; thus, there is need for the present study.

Studies on Location and Differential Item Functioning

Owoeye and Yara (2010) conducted a study on school location and academic achievement of secondary school students in Ekiti State, Nigeria between 1990 and 1997. The design of the study was descriptive research design of the ex-post facto type. The population of the study comprised all SSS3 students from 50 urban and rural that sat for the West African Senior School Certificate Examination in 50 secondary schools in both the urban and rural areas in Ekiti state. The schools chosen were those that sat for the West African Secondary School Certificate Examination between 1990 and 1997. The instrument for data collection was the student location questionnaire (SLQ) and the data obtained was analyzed using mean and t - test. The study had one hypothesis which was formulated at the 0.05 level of significance. Findings from the study showed that there was a significant difference between academic achievement of students from the rural and urban secondary schools in favour of the urban schools. The study by Owoeye et al can be criticized in terms of the design adopted. The design for the study should have been a causal comparative or ex-post facto research design and not a descriptive research design of the ex-post facto type. This is because the study is dealing with a non-manipulative variable, which is school location. However, it is related with the present study because it analyzed location based academic achievement of students. Notwithstanding, the study did not subject the responses obtained to any DIF statistic. Also, the area of study, instrument for data collection and research design differs and this necessitated the present study.

Maliki, Ngban and Ibu (2009) analyzed students' performance in junior secondary school mathematics examination in Bayelsa state, Nigeria. The study focused on the influence of location on the academic achievement of secondary school students in mathematics. The sample size of the study was six hundred (600) students drawn from a population of twelve thousand four hundred and thirty-six (12,436) students who sat for the JSSCE mathematics examination in Bayelsa state, Nigeria in 2006. The instrument used to collect data was the 2006 JSCE mathematics objective test items and the data was analyzed using mean and standard deviation. The results obtained indicated that there is a significant difference in the performance of students from rural and urban schools in favour of the students from the rural schools. This study has similarities with the present study in the sense that it analyzed location-based students performances. The two studies differ in some ways. They include in the area study, method of data analysis and instrument for collecting data. Hence, both studies are not the same and therefore, the present study is imperative.

Similarly, Yusuf and Adigun (2010) investigated the influence of school type, sex and location on students' academic performance in Ekiti state secondary schools. A descriptive research of the survey design was adopted for the study. The population of the study consisted of all public secondary schools Ekiti State, Nigeria. Forty (40) secondary schools were sampled for the study. School type, sex, location and students' academic performance inventory instrument was designed and used to collect data for the study. Data collected were analyzed using percentage scores and t- test statistics. A research question and three null hypotheses were generated and tested at the 0.05 level of significance. Findings from the study showed revealed that school type, sex and location had no significant influence on students' academic performance. The above study differs from the present study in the research design used, area of study, method of data analysis, population and sample size adopted. It has relevance with the present study because it investigated location based academic achievement of students. The two studies are different, implying that the present study is imperative.

In another study, Amuche and Akpan (2013) assessed item bias using Differential Item Functioning technique in NECO Biology conducted examinations in Taraba state, Nigeria. The research design employed was a comparative research design. The population for the study comprised all students in Taraba state, Nigeria who enrolled for the senior school certificate examination in 2012. Four hundred and thirty-two (432) SSS3 students from thirteen (13) secondary schools made up the sample size. The study investigated items that are biased in relation to school location. The NECO biology objective questions for 2012 were used as the instrument for collecting data whereas the logistic regression analysis was used to analyze the data obtained. The research findings showed that out of the 60 items in NECO biology objective questions, 8 items are biased in relation to school location. The items disadvantaged the rural school examinees and favoured the urban school examinees. The above study has similarities with the present study in some aspects. Firstly, the study analyzed DIF with respect to school location which is one of the variables in this present study. Secondly, both studies employed the causal comparative type of research design and made use of the Logistic Regression Analysis Procedure for investigating DIF. Differences abound in both works in the area of study, and data collecting instrument. For this reason, this study is necessary.

Inyang (1991) conducted a study on five hundred and twenty-two (522) rural and five hundred and twelve (512) urban Akwa-ibom and Cross-river state examinees at the 1980 common entrance examination in mathematics. The examination contained 33 multiple choice mathematics items. The research design employed was the descriptive design of the ex-post facto type. The study used three methods of DIF which are the Modified Scheuneman Chi-square (SSX^2) procedure, Transform Item Difficulty (TID-45) and Item discrimination method. The Modified Scheuneman Chi-square method discovered 13 items out of the 33 items that showed DIF, the Transformed Item Difficulty (TID) identified 5 items while the item discrimination method flagged 9 items out of the 33 items as being biased. Six items from the SSX^2, 5 from the TID-45 and 6 out of the nine items identified by the item discrimination method all favoured the urban schools over the rural schools. The study differs from the present study in areas of study, methods of DIF analysis procedure employed and instrument for data collection. Moreover, both studies investigated DIF with respect to school location. The studies are not similar; therefore, the present study is necessary.

Umoinyang, Ndifon and Idiku (2014) assessed location based differential item functioning of 2010 Junior Secondary School Mathematics Examination in southern Educational zone of Cross River State, Nigeria. The research design for the study was the inferential survey and three hypotheses were formulated for the study at 0.05 level of significance. The population of the study comprised 11,811 Junior Secondary School three (JSS3) students from one hundred and eighty-four secondary schools in the Southern Educational Zone of Cross River State who sat for the 2010 junior secondary school certificate examination. One thousand eight hundred and thirty-three (1833) students were studied and two DIF detection methods (Mantel Haenszel and Scheuneman statistics) were employed. The instrument used for the study was the multiple-choice items of the JSS3 mathematics examination which contains 60 items. The findings of the study showed that there was a significant school location Differential Item Functioning. The Mantel-Haenszel Statistics detected two items that function differentially against students in urban schools while the Scheuneman Chi-Square (SSX^2) detected one item that function differentially against students in urban school. The study has similarities with the present one because they investigated location based differential item functioning but differs from the present study in instrument for data collection, the area of study, research design, and method of DIF analysis. Also, the above study investigated DIF in mathematics while the present study is focused on DIF in Economics SSCE. Therefore, the present study is therefore, imperative.

Summary of Review of Literature

The literature has been reviewed on the various variables of the study. It covered the conceptual framework, theoretical framework, related sub-themes and empirical studies on use of differential item functioning to detect items that function differently in terms of gender and school location. when a test item measures different things for individuals from different sub groups of the population of test takers who have the same subject matter ability. A test with differentially functioning items can be described as an invalid and biased test. A test with items that are biased will defeat the objective of presenting equal educational opportunity for all irrespective of class, location and sex. Given the fact that WAEC SSSCE Examination is taken by candidates drawn from diverse social environment, language, and sex background, it is necessary to investigate if items used in this examination functioned differently for candidate from the above backgrounds. Different methods exist for detection of differential item functioning. They include methods that examine differences in relative item difficulty across groups e.g. transformed item difficulty method. Other methods include the Logistic Regression Analysis, generalized Mantel Heanszel procedure and the Scheuneman Modified Chi-square method. Some of these are based on item response theory and classical test theory assumptions.

Classical Test Theory and Item Response Theory are the theories in which the WAEC examinations are subsumed into. Item Response Theory models the response of each examinee of a given ability to each item in the test. It is a probabilistic model that attempts to explain the response of a person to an item. Literature revealed that some tests items used in public exams can be biased against male, female, schools from different location and students from different socio-economic status.

Studies have been carried out on differential item functioning in some test used in public examinations in Nigeria. In the literature reviewed, there were no studies on items showing DIF in WAEC SSSCE Economics multiple choice examinations. Also, there was no empirical evidence of any study on DIF carried out in Nsukka Educational Zone of Enugu State, Nigeria. Therefore, the researcher deemed it fit to carry out a study in the area to ascertain the differential item functioning in student Economics achievement in Nsukka Education Zone of Enugu State.

CHAPTER THREE

RESEARCH METHOD

This chapter presents the methods that was used in carrying out the study under the following sub-headings; design of the study, area of study, population of study, sample and sampling technique, instrument for data collection, validity of instruments, reliability of instruments, method of data collection and method of data analysis.

Design of the Study

This study employed causal comparative or ex-post facto research design. Causal comparative or Ex-post facto research design is the type of research design that establishes cause effect relationships and the researcher has no control over the variables of interest and cannot manipulate them (Nworgu, 2015). The design was considered appropriate because the researcher worked with non-manipulative independent variables such as gender and school location.

Area of the Study

This study was carried out in Nsukka Education Zone of Enugu State. Nsukka Education Zone comprised three LGAs namely, Uzo-Uwani, Nsukka and Igbo Etiti L.G.A. There are 58 public secondary schools in Nsukka Education Zone, distributed as follows: 30 in Nsukka L.G.A.; 12 in Uzo-Uwani LGA; and 16 in Igbo-Etiti L.G.A. (Post Primary School Management Board Nsukka LGA 2018/2019 session) See Appendix A, P 75). The choice of Nsukka Education Zone of Enugu State is because; to the best knowledge of the researcher there is no empirical evidence of a study carried out in the area to determine the differential status of students in Economics SSCE, using DIF procedure.

Population of the Study

The population of the study comprised 2563 Senior Secondary School 3 Economics students. The population is made up of 1141 males and 1422 females students. The students in the rural area were 2185 as against 378 in the urban area. (Post Primary School Management Board (PPSMB) Nsukka, 2017/2018 academic session). (See Appendix B, p79). The decision to use co-education Senior Secondary Schools was because this study has gender as a variable.

Sample and Sampling Technique

The sample size of this was 444 SSS3 Economics students drawn from government 46 co-education government owned schools in Nsukka Education Zone of Enugu State using multi-stage sampling procedure. The sample comprised 239 male and 205 females distributed. Firstly, simple random sampling technique was used to select two local government aareas. Secondly, proportionate stratified random sampling technique was used to select 444 from a population of 2079 SS3 Economics students in Nsukka and a population of 484 Economics students in Uzo-Uwani local government area. The items were drawn from each stratum from the strata this is in line with Nworgu's (2015) recommendation, that proportionate stratified random sampling ensures greater representativeness of the sample relative to the population and guarantees that minority constituents of the population are represented in the sample. (See Appendix C p, 83).

Instrument for Data Collection

The instrument for this study is a multiple-choice Economics questions adopted from West African Examinations Council (WAEC) 2018. The instrument consists of two sections; section A and section B. Section A focused on the demographic data of the respondent such gender and school location. Section B of the instrument comprised 50-item questions. Each item consists of a question and a list of possible answers lettered A - D of which only one option is the correct answer. In scoring the instrument, each correct response will attract one (1) mark while incorrect response attracted zero (0) (See Appendix D, p.83).

Validation of the Instrument

The instrument was constructed and validated by experts in the Department of Examinations and Quality Control of the West African Examination Council (WAEC) and therefore required no further validation since the instrument was adopted.

Reliability of the Instrument

To determine the reliability of the instrument, the instrument was administered to 25 Economics students in Nsukka Education Zone of Enugu State who were not part of the study. The responses obtained from the students were subjected to Kudder-Richardson 20 (KR-20) formula to determine the internal consistency of the instrument. A reliability coefficient of 0.89 was obtained (See Appendix B, p 82). The choice of Kudder-Richardson (KR-20) was because the instrument was dichotomously scored.

Method of Data Collection

The instrument was administered to SSS3 Economics students in each of the sampled schools with the help of the Economics teachers in the sampled schools. 2018 Economics Multiple Choice Items were distributed to 25 Economics Students in Nsukka local government and Uzo-uwani . After responding to the instruments, the Economics teacher collected the question papers from the students and submitted them to the researcher for further analysis. To ensure that students put in their best, the researcher through their Economics teacher informed the students ahead of time about the exercise and the need to be prepared because it formed part of their continuous assessment.

Method of Data Analysis

Logistic Regression Analysis Procedure will be used to analyze the data obtained. It was used to answer the research questions posed for the study.

CHAPTER FOUR

RESULTS

The results of this study are presented in this chapter according to the research questions.

Research Question One

What test items on standardized WAEC 2018 SSCE May/June multiple choice Economics questions function differentially in terms of gender?

Table 1: DIF Analysis to Detect Gender Bias on 50 Multiple Choice Economics Questions

Item	B	S.E	Wald	Sig.	Exp (B)	95.0% C.I. for Exp (B)	
						Lower	**Upper**
1	.29	.20	2.27	.132	1.34	.92	1.96
2	.16	.20	.62	.432	1.67	.79	1.72
3	.43	.19	4.88	.027*	1.53	1.05	2.23
4	-.22	.20	1.23	.268	.81	.55	1.18
5	-.09	.19	.22	.643	.91	.63	1.34
6	-.03	.19	.02	.895	.98	.67	1.42
7	.10	.20	.24	.625	1.10	.75	1.63
8	-.38	.19	3.81	.051	.69	.47	1.00
9	.33	.20	2.57	.109	1.38	.93	2.06
10	.83	.23	13.24	.000*	2.30	1.47	3.59
11	.24	.20	1.36	.243	1.27	.85	1.89
12	.25	.20	1.57	.211	1.29	.87	1.91
13	.14	.20	.54	.462	1.16	.79	1.69
14	.20	.21	.94	.333	1.22	.81	1.85
15	.25	.19	1.67	.196	1.28	.88	1.87
16	.26	.19	1.87	.172	1.30	.89	1.89
17	.30	.19	2.38	.123	1.34	.92	1.96
18	.04	.20	.04	.838	1.04	.71	1.53
19	.30	.21	2.07	.150	1.34	.90	2.01
20	.43	.23	3.62	.057	1.54	.99	2.39
21	-.07	.19	.12	.731	.94	.64	1.36
22	.18	.21	.74	.389	1.19	.80	1.79
23	.41	.20	4.37	.037*	1.51	1.03	2.22
24	.18	.19	.89	.345	1.20	.82	1.75
25	.13	.19	.47	.494	1.14	.78	1.67
26	-.24	.19	1.56	.211	.79	.54	1.15
27	-.02	.20	.01	.925	.982	.67	1.44
28	.59	.20	8.57	.003*	1.80	1.22	2.68
29	.45	.20	4.91	.027*	1.57	1.05	2.33

30	.37	.19	3.72	.054	1.45	.99	2.12
31	.22	.20	1.31	.252	1.25	.85	1.83
32	.53	.20	7.10	.008*	1.70	1.15	2.52
33	.45	.21	4.36	.037*	1.56	1.03	2.37
34	.02	.19	.008	.928	1.02	.70	1.49
35	.34	.20	2.85	.092	1.41	.95	2.09
36	-.60	.22	7.73	.005*	.55	.36	.84
37	-.07	.19	.12	.735	.94	.64	1.37
38	-.13	.19	.44	.506	.88	.60	1.28
39	.53	.20	6.74	.009*	1.70	1.14	2.53
40	.51	.19	6.84	.009*	1.66	1.14	2.42
41	-.10	.19	.24	.621	.91	.62	1.33
42	.67	.22	4.56	.033*	1.60	1.04	2.46
43	.15	.20	.56	.456	1.16	.78	1.74
44	.19	.19	.95	.329	1.21	.83	1.76
45	.09	.19	.20	.658	1.09	.75	1.58
46	.41	.20	4.09	.043*	1.51	1.01	2.24
47	.16	.19	.719	.397	1.18	.81	1.71
48	.46	.20	5.34	.021*	1.58	1.07	2.33
49	.21	.19	1.25	.263	1.24	.85	1.80
50	.58	.19	9.04	.003*	1.79	1.23	2.62

Result on Table 1 reveales that out of 50 items in WAEC 2018 SSCE May/June multiple choice Economics questions; DIF was present in fourteen (14) items. These items are item 3, 10, 23, 28, 29, 32, 33, 36, 39, 40, 42, 46, 48 and item 50. These items revealed significant DIF between male and female students with significant level less than 0.05. Among the 14 items that displayed significant gender DIF, only 1 item (item 36) representing 2% was identified to exhibit significant gender DIF for male students while 13 items (3, 10, 23, 28, 29, 32, 33, 39, 40, 42, 46, 48 and item 50) representing 26% differentially functioned for female students.

Research Question Two

What test items on standardized WAEC 2018 SSCE May/June multiple choice Economics questions function differentially with respect to school location?

Table 2: DIF Analysis to Detect School Location Bias on 50 Multiple Choice Economics Questions

Item	B	S.E	Wald	Sig.	Exp (B)	95.0% C.I. for Exp (B)	
						Lower	**Upper**
1	-.78	.20	15.89	.000*	.46	.31	.67
2	-1.03	.20	26.84	.000*	.36	.24	.53
3	.28	.19	2.09	.148	1.32	.91	1.93
4	.65	.20	11.04	.001*	1.92	1.31	2.81
5	-.36	.20	3.31	.069	.70	.48	1.03
6	.55	.19	8.02	.005*	1.73	1.18	2.52
7	.47	.20	5.29	.021*	1.59	1.07	2.37
8	-.37	.19	3.72	.054	.69	.47	1.01
9	-.85	.21	16.93	.000*	.43	.29	.64
10	-1.59	.25	41.91	.000*	.20	.13	.33
11	-.69	.21	11.30	.001*	.50	.33	.75
12	-.43	.20	4.37	.037*	.65	.44	.97
13	-.41	.20	4.30	.038*	.67	.45	.98
14	-1.11	.22	26.10	.000*	.33	.21	.50
15	.30	.19	2.35	.125	1.35	.92	1.97
16	.11	.19	.34	.562	1.12	.77	1.63
17	-.18	.19	.84	.359	.84	.58	1.22
18	.00	.20	.00	.998	1.00	.68	1.47
19	-1.36	.21	41.11	.000*	.26	.17	.39
20	-1.62	.25	41.29	.000*	.20	.12	.33
21	.20	.19	1.09	.296	1.22	.84	1.78
22	-1.23	.21	28.02	.000*	.32	.21	.49
23	-.15	.20	.57	.450	.86	.59	1.27
24	.08	.19	.18	.672	1.09	.74	1.58
25	-.35	.20	3.28	.070	.70	.48	1.03
26	-.06	.19	.10	.748	.94	.65	1.37
27	.21	.20	1.15	.283	1.24	.84	1.82
28	-.90	.20	19.38	.000*	.41	.27	.61
29	-.10	.21	23.36	.000*	.37	.25	.55
30	-.40	.19	4.21	.040*	.67	.46	.98
31	-.55	.20	7.95	.005*	.58	.39	.85
32	-.54	.20	7.19	.007*	.58	.39	.87
33	-1.44	.22	41.08	.000*	.24	.15	.37
34	-.16	.19	.70	.401	.85	.58	1.24
35	-1.07	.21	27.23	.000*	.34	.23	.51
36	1.23	.22	30.20	.000*	3.43	2.21	5.32
37	-.41	.19	4.40	.036*	.67	.46	.97
38	-.35	.19	3.38	.066	.70	.48	1.02
39	-1.11	.21	28.66	.000*	.33	.22	.50
40	.02	.19	.01	.94	1.02	.70	1.48
41	-.52	.19	7.11	.008*	.60	.41	.87
42	-1.97	.24	66.82	.000*	.14	.09	.22
43	-1.30	.21	38.02	.000*	.27	.18	.41
44	-.57	.19	8.78	.003*	.56	.39	.82
45	-.15	.19	.59	.441	.86	.59	1.26

46	-.54	.20	7.02	.008*	.58	.39	.87
47	.14	.19	.57	.451	1.16	.79	1.68
48	-.42	.19	4.52	.034*	.66	.45	.97
49	.02	.19	.01	.912	1.02	.70	1.49
50	-.50	.19	6.52	.011*	.61	.42	.89

Result on Table 2 revealed that 31 items that identified significant DIF in school location. These items include items 1, 2, 4, 6, 7, 9, 10, 11, 12, 13, 14, 19, 20, 22, 28, 29, 30, 31, 32, 33, 35, 36, 37, 39, 41, 42, 43, 44, 46, 48 and item 50. These items revealed significant DIF between urban and rural students with significant level less than 0.05. Among the 31 items identified as having significant DIF as regards to school location, 27 items (1, 2, 9, 10, 11, 12, 13, 14, 19, 20, 22, 28, 29, 30, 31, 32, 33, 35, 37, 39, 41, 42, 43, 44, 45, 48 and item 50) representing 54% were identified to exhibit significant location DIF in favour of urban school students while only 4 items (4, 6, 7 and 36) representing 8% differentially functioned in favour of rural school students.

Summary of the Findings

Based on the analysis of data in the study, the following findings emerged:

1. Out of 50 items in 2018 WAEC Economics questions, 14 items which represent 28% of the test items displayed significant gender DIF at 0.05 level of significant. Among the 14 items that displayed significant gender DIF, only 1 item representing 2% was identified to exhibit significant gender DIF against male students while 13 items representing 26% differentially functioned against female students.
2. Out of 50 items in 2018 WAEC Economics questions, 31 items which represent 62% of the test items displayed significant location DIF at 0.05 level of significant. Among the 31 items, 27 items representing 54% were identified to exhibit significant location DIF in for of urban school students while only 4 items representing 8% differentially functioned in for of rural school students.

CHAPTER FIVE

DISCUSSION, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

In this chapter, the researcher presents the discussion of findings of this study, conclusion, educational implications of the study, recommendations of the study, limitations, suggestions for further studies and summary of the study.

Discussion of the Findings

WAEC Economics multiple choice test items of the senior school certificate examination that function differentially in terms of gender

The results of analysis of students' responses to Economics multiple choice test items used in WAEC SSCE in 2018 showed that Economics tests contain some items with significant gender differential functioning. This means that the test contain items that measured different things for male and female students with the same ability in Economics. From the findings, these items that showed DIF may be due to the structure of the questions and stem, thus, these could be the characteristics that affected the test takers response to getting the item correctly. Nworgu (2011) revealed that current research evidence has implicated test used in national and regional examination as functioning differently with respect to different subgroups. This means that students' scores in such examinations are determined largely by the group to which an examinee belongs and not by ability.

The findings of the study is in agreement with the findings of Abedlaziz, Ismail and Hussin (2011) whose finding reports that out of 30 multiple choice mathematics items administered to grade ten students in Jordan, 17 items showed DIF based on gender. Also, in agreement, was the study conducted by Odili (2004) who reported that in 1999, 2000 and 2001 Biology multiple choice questions, 8, 2 and 3 items respectively, differentially functioned significantly for examinees based on gender. Also in agreement was the finding of

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Madu (2012) who reported that out of 50 test items set by WAEC in mathematics, male and female examinees perform differentially in 39 items and none in 11 items.

The findings of Pedrajita (2009), Obinne and Amali (2013) also found in their respective studies that the test items contained items that functioned differentially for male and female students. Meanwhile, the findings of Umoinyang, Ndifon and Idiku (2014) that assessed gender based differential item functioning of 2010 junior secondary school mathematics examination in Southern education zone of Cross River State disagreed with the findings of the present study. The findings showed that none of the detection method identified items that functioned differentially between male and female students.

WAEC Economics multiple choice test items of the senior school certificate examination that function differentially in terms of school location.

The finding of the study revealed that out of 50 items in 2018 WAEC Economics questions, 31 items which represent 62% of the test items displayed significant location DIF at 0.05 level of significant. Among the 31 items, 27 items representing 54% were identified to exhibit significant location DIF against urban school students while only 4 items representing 8% differentially functioned against rural school students. This may arise from difference in the amount of instructions received by the examinees which could be attributed to school-to-school variability in content coverage and emphasis. The rural school students on these items maybe disadvantaged. The reason is that Urban schools are usually larger, enjoy greater responsibility for resource allocation, are less likely to experience staff, more qualified teachers but students in rural area suffered in all round they lack qualified teachers, infrastructure and so on. The findings of the study indicated that differential performance of urban and rural students in Economics examination could be attributed to school location.

The findings of the study is in agreement with the finding of Igomu and Fan (2013) who reported that out of 60 items in NECO biology objective questions, 8 items are biased in relation to school location. Also, in consonance with the findings of the study, was the study conducted by Inyang (1991) whose study reported that 6 out of the nine items identified by the item discrimination method all favoured the urban school students over the rural school students. The findings of Umoinyang, Ndifon and Idiku (2014) was in agreement with the findings of the present study when the researchers reported that one item detected functioned differentially against students in urban schools.

Conclusion

Based on the findings of the study and discussion that follows, the following conclusions were made; Economics multiple choice questions used by WAEC in 2018 are gender biased as they functioned differentially for examinees in Nsukka Education Zone of Enugu State; and also, location has the greatest influence on differential item functioning. This is because majority of the items showed evidence of location differential item functioning due to school location.

Educational Implications

The study has educational implications to examination bodies, curriculum planners and researchers. Economics multiple choice questions conducted in 2018 favours one sub group more than the other. As some of the items are repeated yearly, it therefore calls for revision, rephrasing or rewording of the faulty test items by examination bodies. By implication, the curriculum planners would be unveiled on the idea that location variability in functioning of examinees during examinations is a recurring issue. This would help them ensure that some aspect of Economics curriculum are revisited or restructured.

Moreover, since gender and school location variability in functioning of examinees during examinations is a recurring issue as revealed in the study. Thus, test item writers for examination bodies like NECO, WAEC, JAMB and NABTEB are implicated by this. The awareness would make them note and seek modalities of writing items that will not discriminate against gender and school location of students.

Recommendations

Based on the findings of this study, the following recommendations were made by the researcher:

1. DIF analysis should be conducted by WAEC test experts and test developers on their test items during the External Examination such as WAEC, NECO JAMB and NABTEB. This will help to reveal items that exhibit Differential Item Functioning which could be revised or eliminated in order to produce items that are fairness.
2. Examination bodies should use DIF for their pilot study using gender, school location and other possible groupings to ensure fairness in their test items.

Suggestions for Further Studies

Based on the limitations and findings of this study, the researcher has the following suggestions for further study.

1. Further research on differential item functioning in WAEC/SSCE Economics multiple-choice test should employ other statisticed procedures such as Mantel-Haenszel technique, Scheuneman modified chi-square statistic and transformed item difficulty in the analysis of differential item functioning in order to compare the findings of the present study.
2. Further research could also be carried out to investigate differential item functioning for other group of students like school type, different and ethnic groups in their respective studies.

Summary of the Study

The study examined the application of Differential Item Functioning (DIF) procedure in analysing Economics students’ achievement in senior secondary school certificate examination in Nsukka education zone of Enugu state. Two research questions were posed to guide the conduct of the study. From the review of related literature, the concept of Economics, gender, school location, differential item functioning, achievement, multiple choice items as well as test item bias were reviewed. Theoretical framework was based on Item Response Theory (IRT) and Classical Test Theory (CTT). Causal comparative or Ex-post factor research design was used for the study. The population for the study comprised 2563 SS3 Economics students comprising of 1141 males and1422 females in the 46 public co-educatoional senior secondary schools in Nsukka education zone of Enugu state. The sample size of 444 Economics students was used for the study. The instrument used for the study was 2018 SSCE 50-item multiple Economics choice questions developed by West African Examination Council (WAEC). To determine the reliability of the instrument, the instrument was administered to 25 Economics students in Nsukka education zone of Enugu State who were not part of the study. The responses obtained from the students were subjected to Kudder-Richardson 20 (KR-20) formula to determine the internal consistency of the instrument. A reliability coefficient of 0.87 was obtained. The data collected from the study were analyzed using Logistic Regression procedure. The study revealed the following findings:

1. Out of 50 items in 2018 WAEC Economics questions, 14 items which represent 28% of the test items displayed significant gender DIF at the 0.05 level of significance. Among the 14 items that displayed significant gender DIF, only 1 item representing 2% were identified to exhibit significant gender DIF against male students while 13 items representing 26% differentially functioned against female students.
2. Out of 50 items in 2018 WAEC Economics questions, 31 items which represent 62% of the test items displayed significant location DIF at 0.05 level of significance. Among the 31 items, 27 items representing 54% were identified to exhibit significant

location DIF in against of urban school students while only 4 items representing 8% differentially functioned in against of rural school students.

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APPENDIX A

AREA OF THE STUDY

LIST OF SCHOOLS IN NSUKKA EDUCATION ZONE

SS3

S/N	NUMBER OF SCHOOLS IN NSUKKA LOCAL GOVERNMENT AREA	M	F	TOTAL
1	S T C Nsukka	372	-	372
2	Nsukka High sch. Nsukka	338	-	338
3	Q R S S Nsukka	-	215	215
4	Com. Sec. Sch. Isienu	100	148	248
5	Urban Girls Sec. Sch. Nsukka	-	169	169
6	Opi High Sch. Opi	44	36	80
7	Com. Sec. Sch. Lejja	28	40	68
8	Com. Sec. Sch. Edem	63	88	151
9	Com. High Sch. Umabor	50	73	123
10	Com. Sec. Sch. Ehendiagu	8	2	10
11	Com. Sec. Sch. Okpuje	40	45	85
12	Com. Sec.Sch. Ibagwani	79	85	164
13	Com.Sec. Sch. Obimo	14	32	46
14	Com. Sec. Sch. Obukpa	51	76	127
15	Com. Sec. Sch. Edeoballa	140	160	300
16	Com. Sec. Sch. Ezebunagu	15	20	35

17	St. Cyprians Girls Sec. Sch. Nsukka	-	230	230
18	Com. Sec. Sch. Nru Nskka	55	101	156
19	Model Sec. Sch. Nsukka	52	116	168
20	Girl sec. Sch. Opi	-	31	31
21	Com. Sec. Sch. Alor-uno	25	29	54
22	Com. Sec. Sch. Opi agu	9	4	13
23	Lejja high sch. Lejja	31	42	73
24	Agu Umabor Sec Sch. Umabor	18	20	38
25	Urban Boys Sec. Sch. Nsukk	121	-	121
26	Comm. Sce. Sch. Akpotoro Obimo	19	38	57
27	Comm. Sec. Sch. Okutu	10	12	22
28	Edemani High Sch. Edemani	16	23	39
29	Comm. Sec. Sch. Breme	12	10	22
30	Comm. Sec. Sch. Ajona Obimo	-	-	-
SCHOOLS IN IGBO-ETITI LOCAL GOVERNMENT				
1	Premier Sec. Sch. Ukehe	90	92	182
2	St.James Aku	26	-	26
3	Com. High Sch. Ukehe	48	57	105
4	Girls Sec. Sch. Aku	-	96	96
5	Com. Sec. Sch. Ozalla	35	20	55

6	Com. Sec. Sch. Ohodo	33	37	70
7	Com. High Sch. Ekwegbe	54	54	108
8	Com.Sec. Sch. Ukopi	22	34	56
9	Oranadu Com. Sch. Ukehe	44	50	94
10	Com. Sec. Sch. Ohebe Dim	61	73	134
11	Com. Sec. Sch. Umunko	40	50	90
12	Com. Sec. Sch. Aku	93	71	164
13	Com. Sch. Sch. Umunna	30	29	59
14	Igb-Etiti Sec. Sch. Ikolo	24	27	51
15	Akutara Sec Sch. Ohodo	30	34	64
16	Comp. Sec Sch. Diogbe	-	-	-
SCHOOLS IN UZO-UWANI LOCAL GOVERNMENT AREA				
1	Adada Sec. Sch. Nkpologu	18	9	27
2	Uzo-Uwani Sec. Sch. Adani	20	30	50
3	Attah Mem. High. Sch. Adaba	6	5	11
4	Girls Sec. Sch. Umulokpa	-	36	36
5	Com. Sec Sch. Abbi-ugbene	30	36	66
6	Com. Sec. Sch. Upkata	30	13	43
7	Com. Sec. Sch.Nimbo	53	29	82
8	Com. Sec. Sch. Ogurugu	27	20	47

9	Uvuru Sec.Sch. Uvuru	20	20	40
10	Com. High. Sch. Nrobo	20	20	40
11	Welfare Sec. Sch Opanda	10	4	14
12	Com. Sec Sch. Ugbene-Ajima	28	36	64

Source: Post Primary School Management Board (PPSMB) Nsukka 2017/2018 academic session.

APPENDIX B

POPULATION OF THE STUDY

LIST OF CO-EDUCATION GOVERNMENT SENIOR SECONDARY SCHOOLS IN NSUKKA EDUCATION ZONE

SS3

S/N	NUMBER OF SCHOOLS IN NSUKKA LOCAL GOVERNMENT AREA	M	F	TOTAL
1	Com. Sec. Sch. Isienu	100	148	248
2	Opi High Sch. Opi	44	36	80
3	Com. Sec. Sch. Lejja	28	40	68
4	Com. Sec. Sch. Edem	113	38	151
5	Com. High Sch. Umabor	50	73	123
6	Com. Sec. Sch. Ehendiagu	8	2	10
7	Com. Sec. Sch. Okpuje	40	45	85
8	Com. Sec.Sch. Ibagwani	79	85	164
9	Com.Sec. Sch. Obimo	14	32	46
10	Com. Sec. Sch. Obukpa	51	76	127
11	Com. Sec. Sch. Edeoballa	220	80	300
12	Com. Sec. Sch. Ezebunagu	15	20	35

13	Com. Sec. Sch. Nru Nskka	105	51	156
14	Model Sec. Sch. Nsukka	72	96	168
15	Com. Sec. Sch. Alor-uno	25	29	54
16	Com. Sec. Sch. Opi agu	9	4	13
17	Lejja high sch. Lejja	31	42	73
18	Agu Umabor Sec Sch. Umabor	18	20	38
19	Comm. Sce. Sch. Akpotoro Obimo	19	38	57
20	Comm. Sec. Sch. Okutu	10	12	22
21	Edemani High Sch. Edemani	16	23	39
22	Comm. Sec. Sch. Breme	12	10	22
	GRAND TOTAL	1079	1000	2079
SCHOOLS IN UZOUWANI LOCAL GOVERNMENT				
1	Adada Sec. Sch. Nkpologu	18	9	27
2	Uzo-Uwani Sec. Sch. Adani	30	20	50
3	Attah Mem. High. Sch. Adaba	6	5	11
4	Girls Sec. Sch. Umulokpa	-	36	36
5	Com. Sec Sch. Abbi-ugbene	40	26	66
6	Com. Sec. Sch. Upkata	30	13	43

7	Com. Sec. Sch.Nimbo	58	24	82
8	Com. Sec. Sch. Ogurugu	21	20	41
9	Uvuru Sec.Sch. Uvuru	20	20	40
10	Com. High. Sch. Nrobo	20	10	30
11	Welfare Sec. Sch Opanda	10	4	14
12	Com. Sec Sch. Ugbene-Ajima	33	11	44
	GRAND TOTAL	286	198	484

APPENDIX C

SAMPLE OF THE STUDY

POPULATION DISTRIBUTION OF 3563 SS3 ECONOMICS STUDENTS IN 46 GOVERNMENT CO-EDUCATION SENIOR SECONDARY SCHOOLS IN NSUKKA EDUCATION ZONE ACCORDING TO LOCAL GOVERNMENT AREA.

LOCAL GOVERNMENT AREA					
	Nsukka		Uzo-Uwani		Total
	Male	Female	Male	Female	
Size	1079	1000	286	198	
	2079		484		2563

The researcher wishes to draw a sample of 444 from this population.

Nsukka local government area

Male: = $\frac{1079 \times 444}{2563}$ = 186.9 Female: $\frac{1000 \times 444}{2563}$ = 173.1 total = 360

Uzo-Uwani local government area

Male: = $\frac{286 \times 444}{2563}$ = 49.5 Female: $\frac{198 \times 444}{2563}$ = 34.3 total =84

Grand total =

Total number of sample size is 444. It should be observed that the relative proportions of the Nsukka and Uzo-Uwani strata in the sample are exactly the same in their relative proportions in the population.

APPENDIX D

ECONOMICS MULTIPLE CHOICE ITEMS

Section A: Demographic data of the respondent

Name of School: ---

Gender: Male Female

School Location: Urban Rural

Section B:

Instruction: Answer all questions

Time Allowed: 1hr30 minutes

1. Which of the following is NOT emphasized in a production possibility curve? (A)scarcity of resources (B) economic development (C) inefficiency in the use of resources (D) unemployment of labour.
2. The organization of productive factors is the responsibility of the------------- (A)management (B) entrepreneur (C) production manager (D) labour union.
3. Producers operating in a free market economy are more efficient as a result of (A) the existence of competition (B) the very few number of participants (C) the commitment of the shareholders (D). the government's regulation of their activities.
4. A download sloping demand curve means that---------(A.) total revenue declines as price is lowered (B) demand falls as output rises (C) demand falls as output falls (D) price must be lowered to sell more.
5. If the price of commodity **X** rises and consumers shift to commodity **Y**, then commodities **X** and **Y** are --------- (A) substitutes (B) complements (C) inferior goods (D) bought together.
6. Goods whose demands vary directly with money income are called-------- (A) inferior goods (B) complementary goods (C) substitute goods (D) normal goods.

7. An exceptional demand curve can result from--------- (A) increase in price of raw materials (B) increase in the size of population (C) exception of future price increase (D) change in taste of the consumer.
8. Palm oil and palm kernel are in-------- (A) joint supply (B) competitive demand (C) competitive supply (D) complementary demand.
9. Which of the following is **true** about **supply of land?** It------- (A) is higher in the urban than rural areas (B) varies with time (C) rises with demand (C) is fixed.
10. The backward bending supply curve of labour indicates -------(A) an abnormal supply situation (B) the law of supply (C) that labour supply and wage rate are directly related (D) that the elasticity of supply is uniform.
11. A supply curve parallel to the X-axis indicates--------- (A) fairly elastic supply (B) infinitely elastic supply (C) fairly inelastic supply (D) perfectly inelastic supply.
12. If the marginal utility of a commodity is equal to its price, then-------- (A) the consumer is in equilibrium (B) more of the commodity can be consumed (C) total utility is also equal to its price (D) the market is not in equilibrium.
13. A price floor is usually fixed at---------(A the equilibrium and causes shortage (B) above the equilibrium and caused shortage (C) below the equilibrium and causes surpluses (D) above the equilibrium and causes surpluses.
14. A market is in equilibrium when-------- (A) there is no government intervention (B) the demand is the same as the supply (C) buyers and sellers are free to sell more goods (D) there is no free entry and exit.
15. A firm's average cost decreases in the long-run because of--------- (A) increasing returns to scale (B) diminishing average returns (C) decreasing marginal returns (D) decreasing average fixed cost.

16. “The lager a firm, the lower its cost of production.” This statement explains the ------ (A) law of diminishing returns (B) concept of economics of scale (C) law of comparative cost advantage (D) theory of division of labor.

Use the table below to answer questions 17 and 18

Quantity	0	1	2	3	4	5	6	7
Total Cost	20	25	28	30	38	55	92	135

17. The total fixed cost is (A) $7.00 (B) $30.00 (C) $20.00 (D) $135.00
18. At output level 5, the total variable cost is-------- (A) $5.00 (B) $20.00 (C) $55.00 (D) $35.00
19. In the long-run. A firm must shut down if its average revenue is-------- (A) greater than average cost (B) less than average variable cost (C) equal to the minimum average cost (D) equal to the average cost.
20. An industry is described as a group of firms (A) that provides jobs for many people (B) which uses advance technology in production (C) which produces similar product (D) that provides jobs for few people.
21. The largest component of national income in developing countries consists of (A) profits (B) profit and rent (C) rent (D) wages and salaries.
22. A baker bought flour and other ingredients for $320.00, spent $52.00 on distribution, sold the bread for $320.00. The value added by baker is ------(A) $302.00. (B) $52.00 (C) $18.00 (D) $622.00.
23. In a country with large population of full-time housewives, national income (A) will be composed of goods produced by women (B) figures will be grossly over-stated (C) statistics will be difficult to calculate (D) figures will be grossly under-stated.
24. Holding money to take care of contingencies is (A) a speculative motive (B) a transactions motive (C) a precautionary motive (D) an expansionary motive.

25. If a housewife has meat and wants tomatoes, she must find someone who has tomatoes to give and want meat. This concept is described as (A) scale of preference (B) opportunity cost (C) complementary demand (D) double coincidence of wants.
26. The stock exchange is an example of the (A) labor market (B) money market (C) commodity market (D) capital market.
27. What happens when the central bank increases the bank rate in an economy? (A) borrowing is discouraged (B) customers increases their borrowing (C) banks can increase their lending (D) money supply increases.
28. Income is redistributed when the rich are progressively taxed and (A) more private schools are established (B) subsidy is provided on petroleum products (C) more public goods are provided (D) farmers are given guaranteed prices.
29. In order to increase revenue, government should tax commodities for which demand is (A) perfectly price inelastic (B) price inelastic (C) price elastic (D) unitary elastic.
30. Which of the following activities will **not** lead to economic growth? (A) massive importation of capital goods (B) intensive capital formation locally (C) use of modern technology (D) massive importation of consumer goods.
31. The poorer the country, the larger the percentage of labor force engaged in (A) agriculture (B) mining (C) trading (D) manufacturing.
32. Which of the following measures can be adopted to stabilize the external value of the local currency? (A) reduce the volume of exports (B) increase the demand for imports (C) increase domestic money supply (D) reduce the demand for imports.
33. Which of the following is **not** a measure for reducing balance of payments deficits? (A) export drive (B) reducing tariffs (C) adding value to export goods (D) increasing local production.

34. Nations engage in external trade because of differences in (A) comparative cost (B) absolute cost (C) fixed cost (D) variable cost.
35. **One** advantage of international trade is that (A) prices of goods becomes stable (B) countries becomes self-sufficient (C) goods consumed are produced at a very high cost (D) it makes possible the consumption of variety of goods.
36. Which of the following forms of economic integration is a member nation free to impose duty against non-members? (A) custom union (B) free trade area (C) common market (D) economic community.
37. The International Bank for Reconstruction and Development (IBRD) performs the following functions **except** (A) granting long-term loan (B) assisting with technical expertise (C) reducing tariff among members (D) developing human resources.
38. **One** benefit a country can derive from the extraction of crude oil is increase in ----- (A) population (B) employment (C) money (D) demand for imports.
39. Which of the following **cannot** be classified as a natural resource? (A) iron rod (B) wild life (C) solar energy (D) gold.
40. If workers at the school canteen cannot sell during the holidays, this is an example of (A) structural unemployment (B) frictional unemployment (C) seasonal unemployment (D) residual unemployment.
41. Local firms can help in reducing unemployment in a country when------- (A) land acquisition becomes centralized (B) imports of substitutes are reduced (C) waste in the firm is eliminated (D) subsidies to firms are decreased.
42. Public limited liability companies are democratic in nature because (A) government appointees are members of the board (B) they are run by elected public officers (C) electoral principles are adopted in the day-to-day management (D) shareholders elect the board of directors.

43. In the event of bankruptcy, owners of joint-stock companies lose--------- (A) their private properties (B) both company and private assets (C) only the capital invested (D) only their dividend.
44. Positive checks as envisage by Thomas Malthus can be prevented if-------- (A) death rate is reduced (B) marriage is abolished (C) more hospitals are built (D) moral restraints is adopted.
45. An electrical engineer who is teaching physics in a secondary school is said to be ----- (A) underemployed (B) unemployed (C) fully employed (D) technologically unemployed.
46. In a pie chart, the population of a city is represented by a sector 45^0. If the country has a population of 10 million people, then the city's population is-------- (A) 0.0045 million (B) 4.5 million (C) 1.25 million (D) 16 million.
47. Which of the following factors is **not** a reason for farmer's unstable incomes? (A) dependence on too many crops (B) poor storage facilities (C) adverse weather condition (D) recession in the world economy.
48. Demand-pull inflation is likely to be caused by------- (A) an increase in the cost of factor inputs (B) increase in the income tax rate (C) increase in bank lending rates (D) increasingly large budget deficit.
49. Economic problems arises in all societies because--------------- (A) resources are mismanaged by leaders (B) there is no proper planning (C) resources are not in adequate supply (D) the services of economists are not employed.
50. Wholesalers play an important role in the distribution of goods and services because they (A) are located very close to consumers (B) finance both producers and retailers (C) pass information on from retailers to consumers (D) sell in small units to consumers.

ANSWERS TO ECONOMICS MULTIPLE CHOICE ITEMS

1.B	6.D	11.B	16.A	21.B	26.D	31.A	36.D	41.B	46.C
2. B	7.C	12.C	17.C	22.C	27.A	32.S	37.C	42.D	47.A
3. B	8.A	13.B	18.D	23.B	28.C	33.C	38.C	43.C	48.A
4. B	9.D	14.B	19.B	24.C	29.D	34.A	39.C	44.D	49.C
5.A	10.C	15.C	20.C	25.D	30.D	35.D	40.C	45.A	50.B

APPENDIX E

COMPUTATION OF KR20 RELIABILITY CO-EFFICIENT FOR 2018 SSCE ECONOMICS MULTIPLE CHOICE TEST

Items	No. Passing	No. Failing	Proportion passing (p)	Proportion failing (q)	Pq
1	12	13	0.48	0.52	0.2496
2	17	8	0.68	0.32	0.2176
3	14	11	0.56	0.44	0.2464
4	17	8	0.68	0.32	0.2176
5	16	9	0.64	0.36	0.2304
6	18	7	0.72	0.28	0.2016
7	15	10	0.6	0.4	0.24
8	15	10	0.6	0.4	0.24
9	18	7	0.72	0.28	0.2016
10	13	12	0.52	0.48	0.2496
11	16	9	0.64	0.36	0.2304
12	18	7	0.72	0.28	0.2016
13	17	8	0.68	0.32	0.2117
14	14	11	0.56	0.44	0.2464
15	15	10	0.60	0.4	0.24
16	17	8	0.68	0.32	0.2176
17	13	12	0.52	0.48	0.2496
18	15	10	0.6	0.4	0.24
19	15	10	0.6	0.4	0.24
20	15	10	0.6	0.4	0.24
21	16	9	0.64	0.36	0.2304
22	13	12	0.52	0.48	0.2496
23	18	7	0.72	0.28	0.2016
24	14	11	0.56	0.44	0.2464
25	14	11	0.56	0.44	0.2464
26	13	12	0.52	0.48	0.2496
27	18	7	0.72	0.28	0.2016
28	14	11	0.56	0.44	0.2464
29	15	10	0.6	0.4	0.24
30	13	12	0.52	0.48	0.2496
31	18	7	0.72	0.28	0.2016
32	15	10	0.6	0.4	0.24
33	16	9	0.64	0.36	0.2304
34	14	11	0.56	0.44	0.2464
35	14	11	0.56	0.44	0.2464
36	15	10	0.6	0.4	0.24
37	14	11	0.56	0.44	0.2464
38	14	11	0.56	0.44	0.2464
39	14	11	0.56	0.44	0.2464
40	16	9	0.64	0.36	0.2304
41	14	11	0.56	0.44	0.2464

42	17	8	0.68	0.32	0.2176
43	14	11	0.56	0.44	0.2464
44	16	9	0.64	0.36	0.2304
45	16	9	0.64	0.36	0.2304
46	16	9	0.64	0.36	0.2304
47	15	10	0.6	0.4	0.24
48	15	10	0.6	0.4	0.24
49	16	9	0.64	0.36	0.2304
50	17	8	0.68	0.32	0.2176
Total					11.6773

Mean $= \frac{\sum X}{N}$

$$= \frac{764}{25} = 30.56$$

S2 $= \frac{\sum X^2 - \left(\sum X\right)^2 / n}{n} = \frac{25646 - (764)^2 / 25}{25} = \frac{25646 - 23347.84}{25}$

$$\frac{2298.16}{25} = 91.9264$$

$$KR20 = \frac{K}{K-1}\left(1 - \frac{\sum pq}{S^2}\right)$$

$$KR20 = \frac{50}{50-1}\left(1 - \frac{11.6773}{91.9264}\right) = \frac{50}{49}\left(1 - \frac{11.6773}{91.9264}\right)$$

$$= 1.020408163 * (1 - 0.127028797)$$

$$KR20 = 1.020408163 * 0.872971203$$

$$KR20 = 0.890786941$$

$$KR20 = 0.89$$

APPENDIX F

OUTPUT ANALYSIS

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

			Parameter coding
		Frequency	(1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted		
			Item1		Percentage Correct
			Wrong	Correct	
Step 0	Item1	Wrong	0	209	.0
		Correct	0	235	100.0
	Overall Percentage				52.9

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.117	.095	1.521	1	.218	1.124

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	2.047	1	.152
		Location(1)	15.884	1	.000
	Overall Statistics		18.073	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	18.233	2	.000
	Block	18.233	2	.000
	Model	18.233	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	595.758[a]	.040	.054

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item1		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item1	Wrong	115	94	55.0
		Correct	85	150	63.8
	Overall Percentage				59.7

a. The cut value is .500

Variables in the Equation

								95.0% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Gender(1)	.293	.195	2.266	1	.132	1.341	.915	1.964
	Location(1)	-.777	.195	15.890	1	.000	.460	.314	.674
	Constant	.314	.166	3.575	1	.059	1.368		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			Item2		
Observed			Wrong	Correct	Percentage Correct
Step 0	Item2	Wrong	239	0	100.0
		Correct	205	0	.0
	Overall Percentage				53.8

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.153	.095	2.599	1	.107	.858

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.486	1	.486
		Location(1)	27.368	1	.000
	Overall Statistics		27.947	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	28.369	2	.000
	Block	28.369	2	.000
	Model	28.369	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	584.540[a]	.062	.083

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Item2 Wrong	Predicted: Item2 Correct	Predicted: Percentage Correct
Step 1	Item2	Wrong	135	104	56.5
		Correct	65	140	68.3
	Overall Percentage				61.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	.155	.197	.617	1	.432	1.168	.793	1.719
	Location(1)	-1.032	.199	26.840	1	.000	.356	.241	.527
	Constant	.215	.166	1.675	1	.196	1.240		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item3 Wrong	Predicted Item3 Correct	Percentage Correct
Step 0	Item3	Wrong	239	0	100.0
		Correct	205	0	.0
	Overall Percentage				53.8

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.153	.095	2.599	1	.107	.858

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	4.950	1	.026
		Location(1)	2.147	1	.143
	Overall Statistics		7.018	2	.030

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	7.055	2	.029
	Block	7.055	2	.029
	Model	7.055	2	.029

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	605.854[a]	.016	.021

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted		
			Item3		Percentage Correct
			Wrong	Correct	
Step 1	Item3	Wrong	186	53	77.8
		Correct	149	56	27.3
	Overall Percentage				54.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.426	.193	4.875	1	.027	1.531	1.049	2.233
	Location(1)	.278	.193	2.088	1	.148	1.321	.906	1.927
	Constant	-.511	.168	9.284	1	.002	.600		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item4 Wrong	Predicted Item4 Correct	Percentage Correct
Step 0	Item4	Wrong	0	196	.0
		Correct	0	248	100.0
	Overall Percentage				55.9

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.235	.096	6.062	1	.014	1.265

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.110	1	.292
		Location(1)	11.029	1	.001
	Overall Statistics		12.226	2	.002

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	12.337	2	.002
	Block	12.337	2	.002
	Model	12.337	2	.002

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	597.074a	.027	.037

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted		
			Item4		Percentage Correct
			Wrong	Correct	
Step 1	Item4	Wrong	70	126	35.7
		Correct	60	188	75.8
	Overall Percentage				58.1

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	-.216	.195	1.226	1	.268	.806	.550	1.181
	Location(1)	.651	.196	11.035	1	.001	1.917	1.306	2.814
	Constant	.066	.165	.158	1	.691	1.068		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item5 Wrong	Predicted Item5 Correct	Predicted Percentage Correct
Step 0	Item5	Wrong	261	0	100.0
		Correct	183	0	.0
	Overall Percentage				58.8

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.355	.096	13.560	1	.000	.701

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.235	1	.628
		Location(1)	3.341	1	.068
	Overall Statistics		3.555	2	.169

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	3.568	2	.168
	Block	3.568	2	.168
	Model	3.568	2	.168

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	598.172a	.008	.011

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item5		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item5	Wrong	261	0	100.0
		Correct	183	0	.0
	Overall Percentage				58.8

a. The cut value is .500

Variables in the Equation

								95.0% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1a	Gender(1)	-.090	.194	.216	1	.642	.914	.625	1.337
	Location(1)	-.355	.195	3.312	1	.069	.701	.478	1.028
	Constant	-.149	.165	.822	1	.365	.861		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Corrrect	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item6 Wrong	Predicted Item6 Corrrect	Predicted Percentage Correct
Step 0	Item6	Wrong	235	0	100.0
		Corrrect	209	0	.0
	Overall Percentage				52.9

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.117	.095	1.521	1	.218	.889

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.009	1	.924
		Location(1)	8.060	1	.005
	Overall Statistics		8.077	2	.018

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	8.094	2	.017
	Block	8.094	2	.017
	Model	8.094	2	.017

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	605.897[a]	.018	.024

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Item6 Wrong	Predicted: Item6 Corrrect	Predicted: Percentage Correct
Step 1	Item6	Wrong	144	91	61.3
		Corrrect	100	109	52.2
	Overall Percentage				57.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	-.025	.192	.017	1	.895	.975	.669	1.422
	Location(1)	.545	.193	8.016	1	.005	1.725	1.183	2.517
	Constant	-.351	.166	4.498	1	.034	.704		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item7 Wrong	Predicted Item7 Correct	Percentage Correct
Step 0	Item7	Wrong	0	159	.0
		Correct	0	285	100.0
	Overall Percentage				64.2

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.584	.099	34.759	1	.000	1.792

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.264	1	.607
		Location(1)	5.346	1	.021
	Overall Statistics		5.582	2	.061

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	5.623	2	.060
	Block	5.623	2	.060
	Model	5.623	2	.060

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	573.639a	.013	.017

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item7		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item7	Wrong	0	159	.0
		Correct	0	285	100.0
	Overall Percentage				64.2

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.098	.200	.239	1	.625	1.102	.745	1.630
	Location(1)	.465	.202	5.290	1	.021	1.592	1.071	2.365
	Constant	.330	.168	3.869	1	.049	1.391		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item8 Wrong	Predicted Item8 Correct	Percentage Correct
Step 0	Item8	Wrong	226	0	100.0
		Correct	218	0	.0
	Overall Percentage				50.9

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.036	.095	.144	1	.704	.965

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	3.882	1	.049
		Location(1)	3.786	1	.052
	Overall Statistics		7.576	2	.023

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	7.620	2	.022
	Block	7.620	2	.022
	Model	7.620	2	.022

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	607.751a	.017	.023

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item8		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item8	Wrong	178	48	78.8
		Correct	152	66	30.3
	Overall Percentage				55.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1a	Gender(1)	-.375	.192	3.811	1	.051	.687	.472	1.002
	Location(1)	-.371	.193	3.715	1	.054	.690	.473	1.006
	Constant	.332	.165	4.038	1	.044	1.394		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item9 Wrong	Predicted Item9 Correct	Percentage Correct
Step 0	Item9	Wrong	280	0	100.0
		Correct	164	0	.0
	Overall Percentage				63.1

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.535	.098	29.594	1	.000	.586

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	2.319	1	.128
		Location(1)	17.019	1	.000
	Overall Statistics		19.494	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	19.878	2	.000
	Block	19.878	2	.000
	Model	19.878	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	564.976a	.044	.060

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item9		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item9	Wrong	280	0	100.0
		Correct	164	0	.0
	Overall Percentage				63.1

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.325	.203	2.566	1	.109	1.383	.930	2.058
	Location(1)	-.848	.206	16.925	1	.000	.428	.286	.641
	Constant	-.355	.169	4.401	1	.036	.701		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item10 Wrong	Item10 Correct	Percentage Correct
Step 0	Item10	Wrong	311	0	100.0
		Correct	133	0	.0
	Overall Percentage				70.0

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.849	.104	67.220	1	.000	.428

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	11.627	1	.001
		Location(1)	44.154	1	.000
	Overall Statistics		56.342	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	60.381	2	.000
	Block	60.381	2	.000
	Model	60.381	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	481.727[a]	.127	.180

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item10		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item10	Wrong	249	62	80.1
		Correct	65	68	51.1
	Overall Percentage				71.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.831	.228	13.237	1	.000	2.295	1.467	3.591
	Location(1)	-1.593	.246	41.909	1	.000	.203	.126	.329
	Constant	-.736	.185	15.900	1	.000	.479		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item11 Wrong	Predicted Item11 Correct	Percentage Correct
Step 0	Item11	Wrong	289	0	100.0
		Correct	155	0	.0
	Overall Percentage				65.1

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.623	.100	39.158	1	.000	.536

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.235	1	.266
		Location(1)	11.328	1	.001
	Overall Statistics		12.656	2	.002

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	12.845	2	.002
	Block	12.845	2	.002
	Model	12.845	2	.002

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	561.591a	.029	.039

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item11		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item11	Wrong	289	0	100.0
		Correct	155	0	.0
	Overall Percentage				65.1

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.237	.203	1.361	1	.243	1.268	.851	1.888
	Location(1)	-.694	.207	11.295	1	.001	.499	.333	.749
	Constant	-.458	.171	7.226	1	.007	.632		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item12 Wrong	Predicted Item12 Correct	Percentage Correct
Step 0	Item12	Wrong	290	0	100.0
		Correct	154	0	.0
	Overall Percentage				65.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.633	.100	40.294	1	.000	.531

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.490	1	.222
		Location(1)	4.318	1	.038
	Overall Statistics		5.871	2	.053

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	5.920	2	.052
	Block	5.920	2	.052
	Model	5.920	2	.052

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	567.260a	.013	.018

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item12		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item12	Wrong	290	0	100.0
		Correct	154	0	.0
	Overall Percentage				65.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.253	.202	1.565	1	.211	1.288	.867	1.914
	Location(1)	-.426	.204	4.373	1	.037	.653	.438	.974
	Constant	-.587	.172	11.654	1	.001	.556		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item13 Wrong	Predicted Item13 Correct	Predicted Percentage Correct
Step 0	Item13	Wrong	265	0	100.0
		Correct	179	0	.0
	Overall Percentage				59.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.392	.097	16.446	1	.000	.675

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.501	1	.479
		Location(1)	4.273	1	.039
	Overall Statistics		4.810	2	.090

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4.835	2	.089
	Block	4.835	2	.089
	Model	4.835	2	.089

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	593.916[a]	.011	.015

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Item13 Wrong	Predicted: Item13 Correct	Percentage Correct
Step 1	Item13	Wrong	265	0	100.0
		Correct	179	0	.0
	Overall Percentage				59.7

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	.144	.195	.542	1	.462	1.155	.787	1.693
	Location(1)	-.407	.197	4.297	1	.038	.665	.453	.978
	Constant	-.291	.166	3.065	1	.080	.748		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item14 Wrong	Predicted Item14 Correct	Percentage Correct
Step 0	Item14	Wrong	296	0	100.0
		Correct	148	0	.0
	Overall Percentage				66.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.693	.101	47.405	1	.000	.500

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item14 Wrong	Predicted Item14 Correct	Percentage Correct
Step 0	Item14	Wrong	296	0	100.0
		Correct	148	0	.0
	Overall Percentage				66.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.693	.101	47.405	1	.000	.500

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.766	1	.382
		Location(1)	26.972	1	.000
	Overall Statistics		27.853	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	28.703	2	.000
	Block	28.703	2	.000
	Model	28.703	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	536.521[a]	.063	.087

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item14		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item14	Wrong	296	0	100.0
		Correct	148	0	.0
	Overall Percentage				66.7

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1[a]	Gender(1)	.202	.209	.936	1	.333	1.224	.813	1.845
	Location(1)	-1.113	.218	26.095	1	.000	.329	.214	.504
	Constant	-.356	.171	4.300	1	.038	.701		

a. Variable(s) entered on step 1: Gender, Location.

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.766	1	.382
		Location(1)	26.972	1	.000
	Overall Statistics		27.853	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	28.703	2	.000
	Block	28.703	2	.000
	Model	28.703	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	536.521[a]	.063	.087

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item14		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item14	Wrong	296	0	100.0
		Correct	148	0	.0
	Overall Percentage				66.7

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.202	.209	.936	1	.333	1.224	.813	1.845
	Location(1)	-1.113	.218	26.095	1	.000	.329	.214	.504
	Constant	-.356	.171	4.300	1	.038	.701		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item15 Wrong	Predicted Item15 Correct	Percentage Correct
Step 0	Item15	Wrong	0	191	.0
		Correct	0	253	100.0
	Overall Percentage				57.0

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.281	.096	8.601	1	.003	1.325

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.716	1	.190
		Location(1)	2.397	1	.122
	Overall Statistics		4.064	2	.131

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4.078	2	.130
	Block	4.078	2	.130
	Model	4.078	2	.130

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	602.750a	.009	.012

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted: Item15 Wrong	Predicted: Item15 Correct	Predicted: Percentage Correct
Step 1	Item15	Wrong	0	191	.0
		Correct	0	253	100.0
	Overall Percentage				57.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1a	Gender(1)	.250	.193	1.674	1	.196	1.284	.879	1.873
	Location(1)	.298	.194	2.352	1	.125	1.347	.921	1.970
	Constant	.015	.164	.009	1	.925	1.015		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			Item17		
Observed			Wrong	Correct	Percentage Correct
Step 0	Item17	Wrong	236	0	100.0
		Correct	208	0	.0
	Overall Percentage				53.2

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.126	.095	1.763	1	.184	.881

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	2.350	1	.125
		Location(1)	.805	1	.370
	Overall Statistics		3.189	2	.203

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	3.198	2	.202
	Block	3.198	2	.202
	Model	3.198	2	.202

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	610.550a	.007	.010

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted		
			Item17		Percentage Correct
			Wrong	Correct	
Step 1	Item17	Wrong	174	62	73.7
		Correct	140	68	32.7
	Overall Percentage				54.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.296	.192	2.384	1	.123	1.344	.923	1.957
	Location(1)	-.176	.192	.843	1	.359	.838	.575	1.221
	Constant	-.207	.164	1.589	1	.207	.813		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item18 Wrong	Predicted Item18 Correct	Percentage Correct
Step 0	Item18	Wrong	0	171	.0
		Correct	0	273	100.0
	Overall Percentage				61.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.468	.098	23.010	1	.000	1.596

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.042	1	.838
		Location(1)	.000	1	.996
	Overall Statistics		.042	2	.979

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	.042	2	.979
	Block	.042	2	.979
	Model	.042	2	.979

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	591.830[a]	.000	.000

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item18		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item18	Wrong	0	171	.0
		Correct	0	273	100.0
	Overall Percentage				61.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.040	.196	.042	1	.838	1.041	.709	1.527
	Location(1)	.001	.196	.000	1	.998	1.001	.681	1.469
	Constant	.446	.168	7.087	1	.008	1.562		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item19 Wrong	Predicted Item19 Correct	Predicted Percentage Correct
Step 0	Item19	Wrong	265	0	100.0
		Correct	179	0	.0
	Overall Percentage				59.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.392	.097	16.446	1	.000	.675

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.664	1	.197
		Location(1)	42.766	1	.000
	Overall Statistics		44.642	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	46.118	2	.000
	Block	46.118	2	.000
	Model	46.118	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	552.633a	.099	.133

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted		
			Item19		Percentage Correct
			Wrong	Correct	
Step 1	Item19	Wrong	153	112	57.7
		Correct	47	132	73.7
	Overall Percentage				64.2

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.295	.205	2.070	1	.150	1.344	.899	2.009
	Location(1)	-1.355	.211	41.110	1	.000	.258	.171	.390
	Constant	.008	.168	.002	1	.963	1.008		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item20 Wrong	Predicted Item20 Correct	Percentage Correct
Step 0	Item20	Wrong	318	0	100.0
		Correct	126	0	.0
	Overall Percentage				71.6

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.926	.105	77.343	1	.000	.396

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	2.980	1	.084
		Location(1)	45.144	1	.000
	Overall Statistics		48.415	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	51.648	2	.000
	Block	51.648	2	.000
	Model	51.648	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	478.036[a]	.110	.158

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted		
			Item20		Percentage Correct
			Wrong	Correct	
Step 1	Item20	Wrong	318	0	100.0
		Correct	126	0	.0
	Overall Percentage				71.6

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.430	.226	3.616	1	.057	1.537	.987	2.393
	Location(1)	-1.616	.252	41.289	1	.000	.199	.121	.325
	Constant	-.581	.181	10.332	1	.001	.559		

a. Variable(s) entered on step 1: Gender, Location.

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.109	1	.741
		Location(1)	1.086	1	.297
	Overall Statistics		1.203	2	.548

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1.204	2	.548
	Block	1.204	2	.548
	Model	1.204	2	.548

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	611.054a	.003	.004

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted		
			Item21		Percentage Correct
			Wrong	Correct	
Step 1	Item21	Wrong	0	203	.0
		Correct	0	241	100.0
	Overall Percentage				54.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	-.066	.191	.118	1	.731	.936	.643	1.363
	Location(1)	.201	.192	1.093	1	.296	1.222	.839	1.780
	Constant	.117	.164	.510	1	.475	1.124		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item21 Wrong	Predicted Item21 Correct	Percentage Correct
Step 0	Item21	Wrong	0	203	.0
		Correct	0	241	100.0
	Overall Percentage				54.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.172	.095	3.244	1	.072	1.187

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item23 Wrong	Predicted Item23 Correct	Predicted Percentage Correct
Step 0	Item23	Wrong	267	0	100.0
		Correct	177	0	.0
	Overall Percentage				60.1

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.411	.097	17.988	1	.000	.663

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	4.347	1	.037
		Location(1)	.528	1	.467
	Overall Statistics		4.912	2	.086

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4.936	2	.085
	Block	4.936	2	.085
	Model	4.936	2	.085

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	592.208[a]	.011	.015

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Item23 Wrong	Predicted: Item23 Correct	Predicted: Percentage Correct
Step 1	Item23	Wrong	267	0	100.0
		Correct	177	0	.0
	Overall Percentage				60.1

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	.411	.196	4.371	1	.037	1.508	1.026	2.215
	Location(1)	-.148	.196	.571	1	.450	.862	.587	1.267
	Constant	-.570	.170	11.297	1	.001	.565		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

	Observed		Predicted: Item24 Wrong	Predicted: Item24 Correct	Percentage Correct
Step 0	Item24	Wrong	247	0	100.0
		Correct	197	0	.0
	Overall Percentage				55.6

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.226	.096	5.607	1	.018	.798

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.902	1	.342
		Location(1)	.188	1	.664
	Overall Statistics		1.081	2	.583

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1.082	2	.582
	Block	1.082	2	.582
	Model	1.082	2	.582

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	608.790a	.002	.003

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted		
			Item24		Percentage Correct
			Wrong	Correct	
Step 1	Item24	Wrong	247	0	100.0
		Correct	197	0	.0
	Overall Percentage				55.6

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1a	Gender(1)	.181	.192	.892	1	.345	1.199	.823	1.747
	Location(1)	.081	.192	.179	1	.672	1.085	.744	1.581
	Constant	-.361	.166	4.752	1	.029	.697		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item25 Wrong	Predicted Item25 Correct	Percentage Correct
Step 0	Item25	Wrong	259	0	100.0
		Correct	185	0	.0
	Overall Percentage				58.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.336	.096	12.218	1	.000	.714

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.435	1	.509
		Location(1)	3.261	1	.071
	Overall Statistics		3.726	2	.155

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	3.740	2	.154
	Block	3.740	2	.154
	Model	3.740	2	.154

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	599.383a	.008	.011

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted: Item25 Wrong	Predicted: Item25 Correct	Percentage Correct
Step 1	Item25	Wrong	259	0	100.0
		Correct	185	0	.0
	Overall Percentage				58.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1a	Gender(1)	.133	.194	.468	1	.494	1.142	.781	1.671
	Location(1)	-.353	.195	3.284	1	.070	.702	.479	1.029
	Constant	-.252	.165	2.317	1	.128	.777		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item26 Wrong	Predicted Item26 Correct	Percentage Correct
Step 0	Item26	Wrong	0	207	.0
		Correct	0	237	100.0
	Overall Percentage				53.4

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.135	.095	2.024	1	.155	1.145

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.574	1	.210
		Location(1)	.113	1	.737
	Overall Statistics		1.677	2	.432

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1.679	2	.432
	Block	1.679	2	.432
	Model	1.679	2	.432

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	611.807[a]	.004	.005

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item26		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item26	Wrong	55	152	26.6
		Correct	54	183	77.2
	Overall Percentage				53.6

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	-.239	.191	1.562	1	.211	.787	.541	1.146
	Location(1)	-.062	.192	.103	1	.748	.940	.646	1.369
	Constant	.292	.165	3.147	1	.076	1.340		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item27 Wrong	Predicted Item27 Correct	Percentage Correct
Step 0	Item27	Wrong	0	172	.0
		Correct	0	272	100.0
	Overall Percentage				61.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.458	.097	22.132	1	.000	1.581

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.007	1	.935
		Location(1)	1.150	1	.283
	Overall Statistics		1.159	2	.560

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1.162	2	.559
	Block	1.162	2	.559
	Model	1.162	2	.559

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	591.636a	.003	.004

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted Item27 Wrong	Predicted Item27 Correct	Percentage Correct
Step 1	Item27	Wrong	0	172	.0
		Correct	0	272	100.0
	Overall Percentage				61.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1a	Gender(1)	-.018	.196	.009	1	.925	.982	.669	1.441
	Location(1)	.211	.197	1.151	1	.283	1.235	.840	1.815
	Constant	.374	.167	5.035	1	.025	1.454		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item28 Wrong	Item28 Correct	Percentage Correct
Step 0	Item28	Wrong	263	0	100.0
		Correct	181	0	.0
	Overall Percentage				59.2

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.374	.097	14.969	1	.000	.688

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	7.967	1	.005
		Location(1)	19.128	1	.000
	Overall Statistics		27.400	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	28.106	2	.000
	Block	28.106	2	.000
	Model	28.106	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	572.177[a]	.061	.083

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item28		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item28	Wrong	206	57	78.3
		Correct	108	73	40.3
	Overall Percentage				62.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.590	.202	8.565	1	.003	1.804	1.215	2.678
	Location(1)	-.896	.204	19.384	1	.000	.408	.274	.608
	Constant	-.315	.168	3.491	1	.062	.730		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

	Observed		Predicted Item29 Wrong	Predicted Item29 Correct	Percentage Correct
Step 0	Item29	Wrong	269	0	100.0
		Correct	175	0	.0
	Overall Percentage				60.6

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.430	.097	19.597	1	.000	.651

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	4.426	1	.035
		Location(1)	23.488	1	.000
	Overall Statistics		28.167	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	28.884	2	.000
	Block	28.884	2	.000
	Model	28.884	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	566.579a	.063	.085

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted		
			Item29		Percentage Correct
			Wrong	Correct	
Step 1	Item29	Wrong	209	60	77.7
		Correct	105	70	40.0
	Overall Percentage				62.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.449	.203	4.913	1	.027	1.567	1.053	2.330
	Location(1)	-.995	.206	23.363	1	.000	.370	.247	.553
	Constant	-.256	.168	2.312	1	.128	.774		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

	Observed		Predicted Item30 Wrong	Predicted Item30 Correct	Predicted Percentage Correct
Step 0	Item30	Wrong	234	0	100.0
		Correct	210	0	.0
	Overall Percentage				52.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.108	.095	1.296	1	.255	.897

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	3.606	1	.058
		Location(1)	4.097	1	.043
	Overall Statistics		7.798	2	.020

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	7.850	2	.020
	Block	7.850	2	.020
	Model	7.850	2	.020

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	606.367a	.018	.023

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted Item30 Wrong	Predicted Item30 Correct	Percentage Correct
Step 1	Item30	Wrong	178	56	76.1
		Correct	136	74	35.2
	Overall Percentage				56.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1a	Gender(1)	.372	.193	3.724	1	.054	1.450	.994	2.115
	Location(1)	-.396	.193	4.211	1	.040	.673	.461	.982
	Constant	-.132	.164	.645	1	.422	.876		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases [a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item31 Wrong	Predicted Item31 Correct	Percentage Correct
Step 0	Item31	Wrong	254	0	100.0
		Correct	190	0	.0
	Overall Percentage				57.2

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.290	.096	9.161	1	.002	.748

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	1.213	1	.271
		Location(1)	7.907	1	.005
	Overall Statistics		9.197	2	.010

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	9.270	2	.010
	Block	9.270	2	.010
	Model	9.270	2	.010

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	596.988[a]	.021	.028

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Item31 Wrong	Predicted: Item31 Correct	Predicted: Percentage Correct
Step 1	Item31	Wrong	195	59	76.8
		Correct	119	71	37.4
	Overall Percentage				59.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	.223	.195	1.312	1	.252	1.250	.853	1.831
	Location(1)	-.552	.196	7.948	1	.005	.576	.392	.845
	Constant	-.168	.165	1.037	1	.309	.845		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item32 Wrong	Predicted Item32 Correct	Predicted Percentage Correct
Step 0	Item32	Wrong	272	0	100.0
		Correct	172	0	.0
	Overall Percentage				61.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.458	.097	22.132	1	.000	.632

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	6.871	1	.009
		Location(1)	6.964	1	.008
	Overall Statistics		14.006	2	.001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	14.216	2	.001
	Block	14.216	2	.001
	Model	14.216	2	.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	578.582[a]	.032	.043

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item32		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item32	Wrong	208	64	76.5
		Correct	106	66	38.4
	Overall Percentage				61.7

a. The cut value is .500

Variables in the Equation

								95.0% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Gender(1)	.533	.200	7.102	1	.008	1.704	1.151	2.522
	Location(1)	-.538	.201	7.191	1	.007	.584	.394	.865
	Constant	-.519	.170	9.290	1	.002	.595		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item33 Wrong	Predicted Item33 Correct	Percentage Correct
Step 0	Item33	Wrong	289	0	100.0
		Correct	155	0	.0
	Overall Percentage				65.1

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.623	.100	39.158	1	.000	.536

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	3.649	1	.056
		Location(1)	43.129	1	.000
	Overall Statistics		47.091	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	49.297	2	.000
	Block	49.297	2	.000
	Model	49.297	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	525.138[a]	.105	.145

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Item33 Wrong	Predicted: Item33 Correct	Percentage Correct
Step 1	Item33	Wrong	229	60	79.2
		Correct	85	70	45.2
	Overall Percentage				67.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1[a]	Gender(1)	.445	.213	4.361	1	.037	1.560	1.028	2.368
	Location(1)	-1.437	.224	41.077	1	.000	.238	.153	.369
	Constant	-.303	.172	3.100	1	.078	.738		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

	Observed		Predicted Item34 Wrong	Predicted Item34 Correct	Percentage Correct
Step 0	Item34	Wrong	259	0	100.0
		Correct	185	0	.0
	Overall Percentage				58.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.336	.096	12.218	1	.000	.714

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.006	1	.936
		Location(1)	.703	1	.402
	Overall Statistics		.711	2	.701

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	.712	2	.700
	Block	.712	2	.700
	Model	.712	2	.700

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	602.412a	.002	.002

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item34		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item34	Wrong	259	0	100.0
		Correct	185	0	.0
	Overall Percentage				58.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.018	.193	.008	1	.928	1.018	.697	1.486
	Location(1)	-.163	.194	.704	1	.401	.850	.581	1.243
	Constant	-.273	.165	2.733	1	.098	.761		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

	Observed		Predicted Item35 Wrong	Predicted Item35 Correct	Predicted Percentage Correct
Step 0	Item35	Wrong	264	0	100.0
		Correct	180	0	.0
	Overall Percentage				59.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.383	.097	15.699	1	.000	.682

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	2.471	1	.116
		Location(1)	27.681	1	.000
	Overall Statistics		30.359	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	31.094	2	.000
	Block	31.094	2	.000
	Model	31.094	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	568.433a	.068	.091

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item35		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item35	Wrong	207	57	78.4
		Correct	107	73	40.6
	Overall Percentage				63.1

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1a	Gender(1)	.340	.202	2.846	1	.092	1.405	.946	2.086
	Location(1)	-1.071	.205	27.232	1	.000	.343	.229	.512
	Constant	-.115	.167	.475	1	.491	.891		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item36 Wrong	Predicted Item36 Correct	Percentage Correct
Step 0	Item36	Wrong	0	145	.0
		Correct	0	299	100.0
	Overall Percentage				67.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.724	.101	51.143	1	.000	2.062

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	6.908	1	.009
		Location(1)	30.868	1	.000
	Overall Statistics		38.138	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	39.816	2	.000
	Block	39.816	2	.000
	Model	39.816	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	521.158a	.086	.120

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted: Item36 Wrong	Predicted: Item36 Correct	Percentage Correct
Step 1	Item36	Wrong	63	82	43.4
		Correct	67	232	77.6
	Overall Percentage				66.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1a	Gender(1)	-.599	.215	7.726	1	.005	.550	.360	.838
	Location(1)	1.232	.224	30.198	1	.000	3.427	2.209	5.318
	Constant	.572	.177	10.488	1	.001	1.772		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item37 Wrong	Predicted Item37 Correct	Percentage Correct
Step 0	Item37	Wrong	251	0	100.0
		Correct	193	0	.0
	Overall Percentage				56.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.263	.096	7.533	1	.006	.769

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item37 Wrong	Predicted Item37 Correct	Percentage Correct
Step 0	Item37	Wrong	251	0	100.0
		Correct	193	0	.0
	Overall Percentage				56.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.263	.096	7.533	1	.006	.769

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item38 Wrong	Predicted Item38 Correct	Percentage Correct
Step 0	Item38	Wrong	0	194	.0
		Correct	0	250	100.0
	Overall Percentage				56.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.254	.096	7.025	1	.008	1.289

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.470	1	.493
		Location(1)	3.417	1	.065
	Overall Statistics		3.857	2	.145

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	3.860	2	.145
	Block	3.860	2	.145
	Model	3.860	2	.145

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	604.572a	.009	.012

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item38		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item38	Wrong	0	194	.0
		Correct	0	250	100.0
	Overall Percentage				56.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	-.128	.193	.443	1	.506	.880	.603	1.284
	Location(1)	-.354	.193	3.381	1	.066	.702	.481	1.024
	Constant	.485	.167	8.399	1	.004	1.623		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item39 Wrong	Predicted Item39 Correct	Percentage Correct
Step 0	Item39	Wrong	265	0	100.0
		Correct	179	0	.0
	Overall Percentage				59.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.392	.097	16.446	1	.000	.675

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	6.023	1	.014
		Location(1)	28.868	1	.000
	Overall Statistics		35.218	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	36.302	2	.000
	Block	36.302	2	.000
	Model	36.302	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	562.449[a]	.079	.106

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted: Item39 Wrong	Predicted: Item39 Correct	Predicted: Percentage Correct
Step 1	Item39	Wrong	213	52	80.4
		Correct	101	78	43.6
	Overall Percentage				65.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	.529	.204	6.739	1	.009	1.697	1.138	2.530
	Location(1)	-1.110	.207	28.660	1	.000	.330	.220	.495
	Constant	-.215	.168	1.635	1	.201	.806		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item40 Wrong	Predicted Item40 Correct	Percentage Correct
Step 0	Item40	Wrong	241	0	100.0
		Correct	203	0	.0
	Overall Percentage				54.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.172	.095	3.244	1	.072	.842

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	6.881	1	.009
		Location(1)	.011	1	.915
	Overall Statistics		6.887	2	.032

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	6.913	2	.032
	Block	6.913	2	.032
	Model	6.913	2	.032

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	605.345[a]	.015	.021

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted		
			Item40		Percentage Correct
			Wrong	Correct	
Step 1	Item40	Wrong	125	116	51.9
		Correct	80	123	60.6
	Overall Percentage				55.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.505	.193	6.837	1	.009	1.657	1.135	2.418
	Location(1)	.015	.193	.006	1	.940	1.015	.695	1.481
	Constant	-.453	.167	7.357	1	.007	.636		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item41 Wrong	Predicted Item41 Correct	Percentage Correct
Step 0	Item41	Wrong	242	0	100.0
		Correct	202	0	.0
	Overall Percentage				54.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.181	.095	3.594	1	.058	.835

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.273	1	.601
		Location(1)	7.182	1	.007
	Overall Statistics		7.422	2	.024

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	7.458	2	.024
	Block	7.458	2	.024
	Model	7.458	2	.024

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	604.448[a]	.017	.022

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted Item41 Wrong	Predicted Item41 Correct	Percentage Correct
Step 1	Item41	Wrong	123	119	50.8
		Correct	77	125	61.9
	Overall Percentage				55.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	-.095	.193	.244	1	.621	.909	.623	1.326
	Location(1)	-.517	.194	7.111	1	.008	.596	.408	.872
	Constant	.100	.164	.370	1	.543	1.105		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item42 Wrong	Item42 Correct	Percentage Correct
Step 0	Item42	Wrong	283	0	100.0
		Correct	161	0	.0
	Overall Percentage				63.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.564	.099	32.648	1	.000	.569

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	3.417	1	.065
		Location(1)	74.567	1	.000
	Overall Statistics		78.385	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	83.979	2	.000
	Block	83.979	2	.000
	Model	83.979	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	497.578a	.172	.236

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

Observed			Predicted		
			Item42		Percentage Correct
			Wrong	Correct	
Step 1	Item42	Wrong	229	54	80.9
		Correct	85	76	47.2
	Overall Percentage				68.7

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Gender(1)	.469	.220	4.556	1	.033	1.599	1.039	2.461
	Location(1)	-1.966	.240	66.820	1	.000	.140	.087	.224
	Constant	-.084	.173	.233	1	.629	.920		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted Item43 Wrong	Predicted Item43 Correct	Percentage Correct
Step 0	Item43	Wrong	268	0	100.0
		Correct	176	0	.0
	Overall Percentage				60.4

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.421	.097	18.785	1	.000	.657

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.403	1	.526
		Location(1)	39.621	1	.000
	Overall Statistics		40.128	2	.000

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.403	1	.526
		Location(1)	39.621	1	.000
	Overall Statistics		40.128	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	41.318	2	.000
	Block	41.318	2	.000
	Model	41.318	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	554.995a	.089	.120

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Tablea

			Predicted		
			Item43		Percentage Correct
Observed			Wrong	Correct	
Step 1	Item43	Wrong	153	115	57.1
		Correct	47	129	73.3
	Overall Percentage				63.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1a	Gender(1)	.152	.204	.555	1	.456	1.164	.780	1.738
	Location(1)	-1.299	.211	38.021	1	.000	.273	.181	.412
	Constant	.034	.168	.041	1	.840	1.034		

a. Variable(s) entered on step 1: Gender, Location.

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	41.318	2	.000
	Block	41.318	2	.000
	Model	41.318	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	554.995[a]	.089	.120

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted Item43 Wrong	Predicted Item43 Correct	Predicted Percentage Correct
Step 1	Item43	Wrong	153	115	57.1
		Correct	47	129	73.3
	Overall Percentage				63.5

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	95.0% C.I.for EXP(B) Upper
Step 1[a]	Gender(1)	.152	.204	.555	1	.456	1.164	.780	1.738
	Location(1)	-1.299	.211	38.021	1	.000	.273	.181	.412
	Constant	.034	.168	.041	1	.840	1.034		

a. Variable(s) entered on step 1: Gender, Location.

Logistic Regression

Case Processing Summary

Unweighted Cases a		N	Percent
Selected Cases	Included in Analysis	444	100.0
	Missing Cases	0	.0
	Total	444	100.0
Unselected Cases		0	.0
Total		444	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Origi...	Internal Value
Wrong	0
Correct	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Location	Rural	200	1.000
	Urban	244	.000
Gender	Male	239	1.000
	Female	205	.000

Block 0: Beginning Block

Classification Table a,b

Observed			Predicted Item44 Wrong	Predicted Item44 Correct	Predicted Percentage Correct
Step 0	Item44	Wrong	232	0	100.0
		Correct	212	0	.0
	Overall Percentage				52.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.090	.095	.900	1	.343	.914

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Gender(1)	.866	1	.352
		Location(1)	8.756	1	.003
	Overall Statistics		9.691	2	.008

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	9.748	2	.008
	Block	9.748	2	.008
	Model	9.748	2	.008

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	604.865[a]	.022	.029

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Item44		
Observed			Wrong	Correct	Percentage Correct
Step 1	Item44	Wrong	120	112	51.7
		Correct	80	132	62.3
	Overall Percentage				56.8

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	.188	.193	.953	1	.329	1.207	.827	1.761
	Location(1)	-.573	.193	8.779	1	.003	.564	.386	.824
	Constant	.064	.164	.154	1	.695	1.067		

a. Variable(s) entered on step 1: Gender, Location.