# ACADEMIC ACHIEVEMENT MOTIVATION OF IBO FIFTH FORMERS

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ABSTRACT

ACADEMIC ACHIEVEMENT MOTIVATION OF

IBO FIFTH FORMERS

By

Bernard Maruwa Amalaha

The purposes of this study were (1) to explore the differences in motivation and academic performance between Ibo secondary school students from the areas of scarcity of food, the heartland, otherwise known as group A, and from the areas of food accumulation, the fringe, otherwise known as group B; (2) to test a measure of academic motivation, the M-Scales[1] total index, its sub-components and the four control characteristic variables of food area, religious membership, parental education, and location of schools as predictors of achievement; (3) to factor analyse the students' responses to the Generalized Situational Choice Inventory with a view to understanding the factors that account for the students' academic motivation; and (4) to compare the resulting factors with those derived in studies employing the Caucasians and Afro-Americans.

Analyses were based on 370 boys and 112 girls from 9 selected schools in East Central State of Nigeria. Motivational and achievement

[1]Developed by Farquhar, et al. at Michigan State University to measure academic motivation.

scores were obtained for each research subject. The motivational scores were derived from the M-Scales test battery, while achievement scores consisted of the students' cumulative aggregate scores (WASC-S) in the West African School Certificate Examination.

Independent analyses were carried out for both males and females. These involved in the main (a) a test of significance of the mean differences between groups; (b) multiple regression (stepwise) analyses employed to examine the relation between the dependent variable (WASC-S) and the independent variables (motivation, and the four characteristic variables of food area, religion, parental education, and location of schools); (c) factor analyses of the 53-item and 45-item responses of males and females, respectively, to the Generalized Situational Choice Inventory (sub-test of the M-Scales battery) using the principal axis solution method with a view to determining the minimum number of independent dimensions needed to account for most of the variance in the students' responses. The quartimax procedure was adopted to modify each item so that it had high loadings on the fewest possible factors and zero or near-zero loadings on the remaining factors.

The t-test analyses between groups showed the following results: (a) There were no differences in motivation between the heartlanders (group A) and the fringers (group B) either on the M-Scale total scores or on the sub-components for both sexes. But a significant difference (.01 level) in performance was found in favor of group A boys over group B boys. There was no difference in performance for the girls. (b) There were no significant differences between Protestant

and Catholic boys in either motivation or performance; but significant differences were found in favor of Catholic girls over their Protestant counterparts in both motivation and performance. (c) Male students from educated parents were significantly higher than male students from uneducated parents in performance and in two sub-scales, the GSCI and the PJCS, whereas no difference was found either in performance or in motivation between girls from educated and uneducated parents. (d) Male students who attended urban schools were significantly higher in performance and in one subscale, the HTI, than their counterparts who attended rural schools. (e) Male students as a group were significantly higher in performance than their female counterparts.

Stepwise regression analyses indicated: (a) that within the boys' sample, location of school (13 percent variance) followed by the M-Scales total index (8 percent variance) were the significant predictors of performance; (b) that within the girls' sample, the M-Scales total index emerged as the most significant predictor (20.3 percent of the total 26.8 percent for the model) of performance; (c) that for the sub-components, the GSCI was the most significant predictor of performance (6.6 percent) for the boys, while the WRL was clearly the most significant predictor (10.9 percent for the girls); (d) that no background variable had any significant influence on motivation for both boys and girls except religion, which appeared to influence motivation for the girls; (3) that the background variables had no significant influence on the M-Scales sub-components scores except religion, which had influence on WRL and food area on HTI for the girls. In other

words, Catholic girls showed higher WRL scores than Protestants, while heartland girls scored higher on HTI than fringe girls.

The results of the factor analyses showed that four and six factors were extracted for the boys and girls, respectively. These factors were named as follows: (1) For the boys, (a) chance-taking versus no chance-taking, (b) intrinsic satisfaction versus external superficiality, (c) problem-solving effectiveness, (d) need academic achievement. (2) For the girls, (a) need academic achievement, (b) unique versus common accomplishment, (c) work-success involvement, (d) self-reliance versus inadequacy of self, (e) delayed gratification, and (f) task orientation versus conspicuous leisure.

Three of the factors were held in common between the Nigerian and American male samples, but they differed in variance contribution and ordering. One factor, problem-solving effectiveness, was peculiar to Nigerian boys. On the other hand, need academic achievement was the only factor common to both Nigerian boys and girls. The rest are different, thus demonstrating differences in motivational patterns. The meanings of these factors to the groups were suggested.

# ACADEMIC ACHIEVEMENT MOTIVATION OF IBO FIFTH FORMERS

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Bernard Maruwa Amalaha

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TABLE OF CONTENTS

LIST OF TABLES

## LIST OF APPENDICES

# CHAPTER I

## INTRODUCTION

This study was intended (1) to investigate the nature of academic achievement motivation[1] of two samples of Ibo Fifth Formers[2] drawn from two different localities, the Ibo "Heartland"[3] and the Ibo "Fringe Areas"[4]; and (2) to test current theory on the relationship of need achievement motivation[5] and academic performance.

A number of education undergraduates in the University of Nigeria, Nsukka, have shown concern in educational seminars over non-attendance, absenteeism, or truancy of children in schools in various areas of East Central State. Personal experience showed that these problems are more prevalent in some localities than in others.

Cursory observation would show two distinct Ibo groups. The first group (hereinafter referred to as group A) consists of Ibos in the "Heartland," where population density is very high (much higher than elsewhere in the State) and agricultural lands (the "acid sands"[6]) are poor and scarce. This relatively harsh environment is believed to have

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[1] Infra, p. 29. [2] Infra, p. 30.

[3] See V. C. Uchendu, The Igbo of Southeastern Nigeria (New York: Holt, Rinehart and Winston, 1965), p. 3f.

[4] Infra, p. 33. [5] Infra, p. 29.

[6] A. T. Grove, "Land Use and Soil Conservation in Parts of Onitsha and Owerri Provinces," Geological Survey of Nigeria Bulletin 21 (Zaria: Gaskiya Corporation, 1951).

taught its inhabitants a mode of adaptation which makes the individual self-reliant. In more recent times, this individual has learned to be mobile and an important factor in the Nigerian urban life. He specializes in trade and crafts instead of farming as a dominant occupation. He farms all right, but he hopes to augment his meagre harvests by buying and trading with those in the "Fringe Areas." Education for his children, as a means of providing for the unpredictable future, is fast becoming a way of life. Perhaps as a consequence, this heartland, agriculturally impoverished owing to very short fallow system and to population pressure, possesses visible evidence, both on the personal and group levels, of attitudes and behaviors favourable to economic development. There are more schools and colleges here, more modern buildings and facilities such as post offices, health clinics, hospitals and dispensaries, town halls, pipe-borne water, and oil pressing mills, some of these organized by members of improvement unions[7] from their "foreign posts" in the urban areas. These improvement unions also initiate scholarship or cooperative schemes with a view to improving the lot of the less fortunate ones in the home villages. People from this area are the leading professionals of all sorts and constitute the bulk of the civil servant cadre. In child rearing, the people emphasize independence, a self-reliant attitude, achievement, and competition with a view to surpassing others in undertakings.

The second group (hereinafter referred to as group B) consists of Ibos in the fringes away from the heartland, who migrated from it

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[7]Infra, p. 34.

initially either as a result of warfare or in quest of a better environment for good production.[8] These people occupy the richer agricultural soils of the territory today. In terms of man-land ratio, they enjoy greater opportunity than their kinsmen in the former area. They have an abundance of good crops--much more than their counterparts in the former territory. A mark of their abundance is seen in the ubiquitous presence of the prestigious yam, which requires rich soil to grow big or produce multiple seed-yams from one sand. These people have been long enough in their present locations for differential behavioral characteristics to emerge. Going away from the certainties of the home to the uncertainties abroad carries some strong emotions. The beaten path is, therefore, preferred to risk-taking away from home. Education as an indirect means of encouraging mobility does not possess the same emotional involvement as it has for people in the heartland. They prefer to welcome and play host to their "less fortunate kin" from the heartland (provided, of course, that the newcomer lays no claims of ownership to any part of the land) instead of going into the heartland for permanent settlement themselves. There are no remarkable improvement unions in this area that are solid and enduring enough to cause innovations, because of poor elite leadership and guidance. As a result, this relatively rich agricultural area possesses little visible and demonstrable evidence of attributes

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[8] I. Nzimiro, "Study of Mobility Among the Ibos of Southern Nigeria," International Journal of Comparative Sociology, VI (1965), 117-130. R. N. Henderson gives account of how the tripartite influences of the British Government, the Commercial Houses, and the Missions encouraged the Onitsha and adjacent Ibos into other areas of Nigeria. See his "Generalized Cultures and Evolutionary Adaptability: A Comparison of Urban Efik and Ibo in Nigeria," Ethnology, V (1966), 365-391.

and behaviors which favor economic development. The environment here is purely rural. Housing is of the rectangularly built mud and thatched type. There are fewer schools, and few top civil servants originate here. Professionals are beginning to emerge, but not in any way comparable to the overwhelming number in the heartland area. Most parents do not see sending their children to school as a moral obligation. The greater number of children a man has, the more self-fulfilled he feels, since these will rally round him during farming season to help out in the farms. In some instances, children are allowed to go to school only because neighbors send their children. This attitude might account for the absenteeism of children from school during the farming season. The expectations regarding child-rearing practices are not the same here. Cooperative behavior is preferred to competition. Early independence of action of the youngster is not very much encouraged.

Group A is more "modern" than the more traditional group B. One evidence for this is Ugwu's fieldnotes reported by Huth[9] in his dissertation, in which Ugwu asked samples in four villages representing Onitsha (Agulu), Owerri (Umunumo), Nsukka (Unadu), Abakaliki (Nkalike) to identify for him factors that determine an individual's social status and prestige. Examination of their responses showed that the two villages representing group A mentioned education as one of the factors, while neither of the two villages of group B mentioned education. In Table 1.1 are listed the responses that Ugwu recorded.

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[9]Powers William Huth, "Traditional Institutions and Land Tenure as Related to Agricultural Development Among the Ibo of Eastern Nigeria" (unpublished Ph.D. thesis, University of Wisconsin, 1969).

Table 1.1.--Determinants of prestige and status as seen by four representative villages.

| Group A | | Group B | |
|---|---|---|---|
| Agulu | Umunumo | Unadu | Nkalike |
| Wealth | Heredity | Village service | No. of Yam barns |
| Village service and Honesty | Wealth, Honesty Village service | Truth and Honesty | No. of wives |
| Education | Education | Title taking Wealth | --- |

Commenting on the above observation Huth remarked:

> Nkalike is probably the most traditional village of the group and hence the importance of particular traditional status symbols such as the number of yams and wives. Yams have always held a special place of importance not only in Abakalike province but in all Iboland. . . . "People whose yam houses are full and who have taken the Yam title command great prestige." In places like Agulu farming is less prestigious not because this is a value of society but simply because under peasant techniques and depleted soil conditions it does not provide the average individual much of a living and so, by default, trading has become more prestigious. At any rate, Ugwu seems well justified in his statement: "From information I gathered, I see Agulu as a typical Ibo village . . . republican in everything, ruggedly individualistic, wealth being more important now than any other thing in deciding status."[10]

The above contrast, no doubt, carries some motivational implications for the two groups. The question is not whether Nkalike has no motivation and Agulu has all the motivation. The contrast is made to emphasize two important points made by McClelland and Goldberg.

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[10] Ibid., p. 261.

McClelland[11] advanced a theory which views human motives as

> . . . a number of affectively toned associative chains arranged in a hierarchy. At the top of the hierarchy for a given individual (or a group of people) is that associative chain which is cued off most easily by almost anything that happens to him (them) and which has the largest network of connections with other thoughts.

If the responses by Ugwu villages characterize their associative chains, it is easy to see the value of education in one case and its lack of salience in the other.

The other point is the assertion by Goldberg[12] who said that the antecedents of need for achievement are various social-cultural, familial, and personal factors which interact to determine to what extent potential ability will be translated into commensurate attainment. He believes that some of the influences are fairly uniform throughout a given culture, while others are specifically related to the mores and expectations of the varied sub-groups; these sub-groups have their own means of evaluating success and of placing valuations on areas of endeavor and on the attainmnet level which will bring the individual special status.

Something in this vein is likely to be happening within the Ibo group as a cultural entity. It was thus hypothesized that these two modes of socialization and adaptation in the Ibo sub-groups might produce a differential need for achievement in education as a psychological trait in the children of the two areas and that this will show up when a sensitive objective measure of the trait is used.

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[11] D. C. McClelland, "Changing Values for Progress, " in Education and the Development of Nations, ed. by Hobert W. Burns (Syracuse: Syracuse University Press, 1963), p. 67.

[12] M. L. Goldberg, "Motivation of the Gifted," National Society for the Study of Education, 57th Yearbook, Pt. III, 1958, p. 89.

Researchers interested in the achievement of dichotomous groups, usually under-achievers versus over-achievers, have used one of four techniques in separating the groups for study. Some studies have employed the Central Tendency splits or the Arbitrary Partitions where the middle group is eliminated; others have used the Relative Discrepancy Splits or the Regression Model Selection.[13]

In the Central Tendency Splits, under- and over-achievement are determined by dichotomizing a distribution of combined aptitude and achievement measures. Under- and over-achievement in the Arbitrary Partitions technique are determined by contrasting extreme groups in achievement-aptitude distributions, and by eliminating a middle group as Winberg[14] did. The Relative Discrepancy Splits use grade point average and aptitude predictors which are ranked independently. Under- and over-achievement is determined by the discrepancy between the two ranks. Diener,[15] for instance, converted aptitude and grade point average into standardized scores. The discrepant groups were then defined on the basis of a difference of rank, plus and minus 15 standardized score distribution. The Regression Model uses a least squares equation to predict achievement from aptitude measures. Under- and over-achievement

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[13]Discussions on these techniques are based on: William W. Farquhar and D. Payne, "A Classification and Comparison of Techniques Used in Selecting Under- and Over-Achieving Students," American Personnel and Guidance Journal, May, 1964.

[14]Wilma A. Winberg, "Some Personality Traits of Collegiate Under-Achievers," Proceedings, Iowa Academy of Science, LIV (1947), 267-270.

[15]C. L. Diener, "Similarities and Differences Between Over-Achieving and Under-Achieving Students," Personnel and Guidance Journal, XXXVIII (1960), 396-400.

are then determined on the basis of the discrepancy between predicted and actual achievement. A typical example is that by Farquhar and Payne.[16]

A thorough examination of the techniques of selection, whether considered adequate or inadequate, showed that:

1. standardized instruments (intelligence, achievement, and aptitude scales) were used;
2. subjects of the studies took these standardized instruments either before or during the investigations;
3. those who had taken them before had their scores recorded in their cumulative record folders.

Faced with the lack of these standardized instruments which would have added important variables to the research design, and faced with lack of time and money to secure or construct them, the author relied on the use of the M-Scales alone. Thus if differences were to emerge between the heartlanders and fringers, in whatever direction, we will have unearthed strong evidence that the nature of achievement motivation of the Ibos is, at least in part, a function of the ecological environment in which they live. More specifically, we will have some, admittedly weak, basis for accepting the hypothesis that a subsistance economy, represented in this study by the Ibo heartlanders or the Ibo fringers, has some effect on the socialization of human beings and thus influences their achievement motivation.

Observation of the urban Ibos, who are scattered all over Nigeria, might have created a false impression that all Ibos are

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[16]Farquhar and Payne, op. cit., p. 4.

achievement oriented. This impression is assuming the character of a stereotype, especially after Ottenberg[17] had described them as "receptive to change" and LeVine[18] empirically demonstrated that they ranked highest in need achievement in Nigeria. This impression the author doubted from personal knowledge and experience. This doubt was accentuated by the differential reactions of people to the vicissitudes brought about by the recent civil war.

As a result of the Nigerian civil war much of the material progress in Iboland so far achieved was wrecked. Buildings and other forms of landed property were destroyed. Money in the form of cash became valueless. People lost faith in life. But the determination to make up for lost time, rededication and resurgence, and an implacable faith for the future the author felt were more noticeable in group A than in group B. In group A, markets were quickly rebuilt voluntarily, village after village made new pledges to defray the cost of their children's schooling despite their abject financial situation. It was many months afterwards that people in group B started some ventures, apparently in imitation of those of the heartland. Some people changed occupational roles from many years of civil service or of teaching to that of budding entrepreneurs--all with funds negotiated abroad or from banks and friends. More and more children, even

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[17]Simon Ottenberg, "Ibo Receptivity to Change," in Continuity and Change in African Cultures, ed. by W. R. Bascom and M. J. Herskovits (Chicago: University of Chicago Press, 1958), pp. 136-37.

[18]Robert LeVine, Dreams and Deeds--Achievement Motivation in Nigeria (Chicago: University of Chicago Press, 1966).

those considered overage in normal times, went back to schools that were devoid of equipment and hard furnishings. Again these actions were more common in group A than in group B. This is psychological resilience in action and might be activated by the presence of achievement motivation, which needs to be studied and, if possible, understood.

The foregoing account has made no distinction between males and females in either group. Each group has a way of evaluating children's performances. But on the whole, Ibo parents do not have the same expectations for girls as for boys. Being a male-oriented society they place more value on the actions of the boy than on the girl. Parents' most cherished desire is to have a boy who will inherit their property when they die.[19] This accounts for more jubilation at the birth of a baby boy than of a baby girl. Some parents who expect to give birth to a boy but give birth to a girl instead christen her with such name as "Ejinwanyi Emeke" (what do you do with a woman) or "Nwanyi Meole" (what can a woman do).

Parents are concerned that the boy represents the good qualities of the father. Some cultural rituals are employed to achieve this objective. Thus, the boy undergoes initiation ceremonies to introduce him to the thought processes of his group. He joins age-grade societies in order to learn the accepted characteristics of young and growing members of the group. Masquerade clubs inculcate in him the virtues of valor and taking pains. He has more freedom to do some reality-testing of his abilities. All these are denied the girl, who is expected to be groomed for motherhood.

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[19]Very rarely does a girl become heir to the parents' property.

It is entirely likely that this differential cultural treatment between the boy and the girl might be related to their need achievement motivation and academic achievement characteristics. This, in effect, would mean differences in M-Scale (including sub-test) scores and other measures between the sexes.

Another level of the research problem concerns generalizability of theorizing on achievement motivation. Theory construction and verification relating to need achievement motivation have been mainly the concern of the more advanced countries. There is no way of knowing whether the propositions formulated and tested only in a single culture, like the United States, or in closely related advanced cultures, like Western Europe, are generally valid, unless comparable data are available from culturally variant countries. Such comparable data, according to Kelman,[20] will help develop theoretical models that can encompass contradictory findings in different cultural contexts. Farquhar[21] realized this fact earlier while reviewing the progress made with the M-Scales as an instrument to measure achievement motivation. He observed that the ultimate goal was to replicate the motivational project in a number of cultures in order to isolate the factors unique to each culture and common among cultures.

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[20]Herbert C. Kelman, "Social Psychology and National Development: Background of Ibadan Conference," Journal of Social Issues, XXIV (1968), 9-23.

[21]William W. Farquhar, "An Integrated Research Attack on Academic Motivation," Journal of Counseling Psychology, IX (1962), 84-86.

The express intention of this study is to apply the M-Scales,[22] a measure of academic motivation, to assess motivation of Ibos in the East Central State of Nigeria.

In the later portions of the thesis, analysis will be based on the assumption that the M-Scales are cross-culturally valid, that is, that they pick up differences in motivation between groups. On the other hand, we are consciously aware that the Scales have never been cross-culturally validated, at least in Nigeria. To do so, we would have to select two groups known to be different in achievement motivation and test the M-Scales to see whether those differences were picked up.

This lack of certainty concerning the validity of the M-Scales in this cultural setting, however, is not a crippling weakness. Nonetheless, the reader should be aware that failure of the M-Scales to distinguish between groups A and B is subject to two conflicting interpretations--that is, either the two groups were in fact the same and the M-Scales validity showed that identity, or the two groups were in fact different, but the M-Scales failed to pick up the differences. Should such a null result occur, further research would be required to resolve this dilemma. On the other hand, if the two groups are measured as different in achievement motivation by the M-Scales, the likelihood of the M-Scales' being a valid measuring instrument in this context will be enhanced, inasmuch as a spurious reading of a difference

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[22] W. W. Farquhar, "A Comprehensive Study of Motivational Factors Underlying Achievement of Eleventh Grade High School Students," Project 846, U.S. Department of Health, Education and Welfare, 1963.

would be a chance occurrence of extremely low probability if there were no real difference between the two groups. Given the extremely difficult circumstances attendant upon doing social research in immediate post-war Eastern Nigeria, the investigator decided to proceed with the study, accepting the possibility of additional research being necessary in case the two groups showed no difference in M-Scales results.

LeVine[23] in a previous study hypothesized that since the Ibo Society possessed an open social system[24] and ingredients of upward mobility within its structure, the Ibos would conceivably possess more achievement motivation as a psychological trait than any of the other ethnic groups where ascription rather than individual acquisition is more emphasized. In testing the hypothesis, his selection plan consisted of comparable groups of Hausa, Ibo, and Yoruba students from the top grades of leading non-Catholic men's secondary grammar schools located in Zaria, Onitsha, and Ibadan. Methodology was a projective-type technique consisting of

a. analysis of dream reports, for indications of desire to excel, the type of fantasy analysis originally used for uncovering unconscious motives; and

b. analysis of contents in an essay on "success."

The scoring technique was the McClelland-Atkinson method, reported as Appendices A and B of the LeVine study. His major finding was that frequency of achievement imagery in dream reports was greatest for the Ibo, followed by the southern Yoruba, northern Yoruba, and

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[23] LeVine, op. cit. [24] Infra, p. 34.

Hausa in that order. Frequency of mention of obedience in the essay on success was greatest for the Hausa, Yoruba, and Ibo in that order. LeVine concluded by saying that his findings were consistent with the hypothesis that there are indeed differences in achievement motivation between the Hausa, Ibo, and Yoruba, and that these differences have concomitants in achievement attributes and behavior.

The present study is different from LeVine's in four ways:

a. The present study uses objective measures instead of the projective techniques for generating data.

b. This study is concerned with the Ibos alone as against the inter-ethnic comparisons made by LeVine.

c. LeVine investigated students' fantasy need achievement without reference to a performance criterion, whereas this study employs such a criterion.

d. The Onitsha sample featured in his study is from the heartland area, as defined in the present study; hence the sample is biased in favor of Ibo heartlanders. If our assumption of differences in motivation between the heartlanders and the fringers of the Ibo cultural areas is correct, the LeVine sample from the Ibo areas cannot be considered representative of the culture as a whole.

## The Need for the Study

The need to understand Ibo achievement motivation becomes apparent particularly now that it seems that the daily as well as the ultimate existence of a given society will depend more and more on the

results of the individual's achievement of excellence in his undertakings. This need becomes more important now that the belief is common and popularized by social scientists, especially McClelland and his associates, that it is not the abundance of wealth or highly trained manpower that makes a nation great, but the psychological disposition of individuals which helps them progress economically, take risks of a moderate nature, develop initiative and creativity, plan and utilize problem-solving as a way of life, and accept delayed gratification as a means of turning their material resources into usable wealth. In other words, there is a linkage between national rate of economic growth and level of achievement motivation in the population.[25]

Motivation, like any other psychological trait, may not be evenly distributed; but those who are highly and lowly motivated represent extremes in reacting to the demands of the present-day society, extremes which need careful study if their psychological and behavioral manifestations are to be even partially understood.

This study, then, aims at discovering the nature of academic achievement motivation[26] in the Ibo territory and some antecedents to this kind of motivation, which may be operating singly or in combination.

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[25]See David C. McClelland, The Achieving Society (New York: Van Nostrand, 1961). This book is not a further development of the achievement motivation theory, but an application of theory to the economic development of different societies at different times.

[26]Infra, p. 29.

## Objectives of the Study

The objectives of this study are four-fold:

1. To explore the differences in academic achievement motivation between Ibos in two different environmental situations, using an objective measure, the M-Scales;[27]
2. To test the same objective measure as a predictor of academic achievement[28] of male and female fifth formers in East Central State secondary schools;
3. To explore the underlying factorial structure of academic achievement motivation for Ibo fifth form boys and girls, using the Generalized Situational Choice Inventory (GSCI), which is designed to test academic achievement motivation within the M-Scales battery; and
4. To compare the findings with those of other investigators, who have studied whites and Afro-Americans in North America.

## Theoretical Background of the Problem

The present research grows out of two theoretical areas of investigation, namely: the personal or individual aspect of motivation, and the socio-cultural influences on individual motivation. A number of theorists and investigators have touched upon them, and it is to their findings and theories that we now turn.

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[27] Infra, p. 31. [28] Infra, p. 30.

Masden,[29] in Theories of Motivation, has reviewed some 31 theories of motivation. Most of these have been organized into a taxonomy by McClelland[30] in The Achievement Motive. On the basis of his original and valuable experiments on human motivation, he rejected the prevailing theories of motivation as depending too much upon experiments with animals and hence inadequate to explain the functions of the complicated nonbiological motives. McClelland calls one type of theory "the survival model," another "the stimulus intensity model," and a third "the stimulus pattern model." His objections to these models are contained in The Achievement Motive (pp. 12-27). However, McClelland and his associates must have borrowed some ideas of earlier workers which they later cast into their own molds. A review of a few such precursors is in order here.

Alfred Adler[31] suggested that gratification of achievement needs may be one of the most important goals of human behavior. This is exemplified in concepts such as "inferiority complex," "masculine protest," and "striving for superiority" which taken together show that achievement is basic and necessary for positive feelings of satisfaction by human beings.

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[29] K. B. Masden, Theories of Motivation (Kent, Ohio: The Kent State University Press, 1968).

[30] D. C. McClelland et al., The Achievement Motive (New York: Appleton-Century-Crofts, Inc., 1953).

[31] Alfred Adler, The Practice and Theory of Individual Psychology (New York: Harcourt, Brace and Co., 1927).

Lewin[32] went further than Adler in his study of the "upward striving" nature of human achievement aspirations and behavior. He observed that attainment of goals produced renewed vigor in goal-striving and levels of aspiration.

Young,[33] after some initial shifts, settled for motives based on affective arousal; and this emphasis was taken up by McClelland et al.

Murray[34] was the actual "father" of the need achievement concept. He originally discussed it in terms of behavior, such as aspiring to accomplish something difficult, striving to rival and surpass others, and striving to increase self-esteem through the successful application of one's abilities to problem situations. He called it "elementary ego need," which alone may prompt any action or be fused with any other need.

This construct has been examined in some detail by McClelland and others,[35] and they have couched it in a general theory of motivation with emphasis on the affective components of striving behavior. According to their view the achievement motive is an underlying personality characteristic which involves a learned predisposition to attain success in competition with an internalized standard of

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[32]Kurt Lewin, A Dynamic Theory of Personality (New York: McGraw-Hill Book Co., 1936).

[33]P. T. Young, "Food-Seeking Drive, Affective Process, and Learning," Psychological Review, LVI (1949), 98-121.

[34]H. A. Murray, Explorations in Personality (New York: Oxford University Press, 1938), pp. 80-81.

[35]McClelland et al., op. cit.

excellence. For those who strive to acquire this characteristic, it is a personality need for them; hence it may be referred to as need achievement motivation. Characteristic of high need achievement according to this view are (a) long-term involvement, (b) unique accomplishment, and (c) competition with a maximal standard of excellence.

Farquhar[36] and associates have made extensions to this construct. McClelland's model represents the highly motivated without accounting for the lowly motivated. To round out the picture Farquhar and associates supplied the characteristics of low need achievement, which are (a) short-term involvement, (b) common accomplishment, and (c) competition with a minimal standard of excellence.

The result of this bipolarity has been the M-Scales and a number of research studies developed from them. Table 1.2 summarizes the theoretical viewpoints.

Table 1.2.--The polar theory of academic motivation.

| High Achievement Motivation | Low Achievement Motivation |
|---|---|
| 1. Long-term involvement | 1. Short-term involvement |
| 2. Unique accomplishment | 2. Common accomplishment |
| 3. Competition with maximal standard of excellence | 3. Competition with minimal standard of excellence |

[36]Farquhar, "A Comprehensive Study."

The M-Scales are a battery[37] of four-sub-tests for males and females, which measure academic achievement motivation. The strategy of their construction is the forced-choice-type objective questioning in which one sub-item of a two-member item is in the direction of higher motivation and the other is in the direction of lower motivation. The assumption when using these sub-tests is that the highly motivated subjects will choose the higher motivation items and vice versa.

The M-Scales as theory-based instruments have been used mainly with Caucasian samples. There is need to study African samples to see to what extent they are applicable.

Another proposition that is being tested in this study is the "subsistence economy hypothesis" of Barry and his associates.[38] It states that child training in rural societies is an adaptation to the prevailing system of subsistence economy. These social scientists believe that in societies with low accumulation of food resources, adults tend to be individualistic, assertive, and venturesome. These are some of the characteristics of the highly motivated individuals that McClelland[39] and Rosen[40] have shown. By parallel reasoning, adults in societies with accumulation of food resources tend to be

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[37] Infra, p. 31.

[38] H. Barry III, Irvin L. Child, and Margaret K. Bacon, "Relation of Child Training to Subsistence Economy," American Anthropologist, LXI (1959), 51-63.

[39] McClelland, op. cit.

[40] B. C. Rosen, "Socialization and Achievement Motivation in Brazil," American Sociological Review, XXVII (1962), 612-24.

conscientious, compliant, and conservative. Emphasis in child training, according to this view, would be toward the development of kinds of behavior especially useful for the adult economy.

It was from this consideration that the author developed the concepts of groups A and B Ibos which this study is investigating. The author reasoned that if students from the area of scarcity of food (group A) who are trained early to be independent and self-reliant are set to compete with another group of students from the more food-accumulative area (group B) whose upbringing does not emphasize independence, self-reliance, and venturesomeness, the former will perform better than the latter on the M-Scales, and on the West African School Certificate Examination--a measure of academic performance.

## The Hypotheses[41]

From considerations of the study objectives, the characteristics of the subjects, and the theoretical background, the following null hypotheses have been developed to be tested:

1. There is no significant difference in means on the total M-Scales scores between group A and group B fifth formers for either males or females.
2. There is no significant difference in mean aggregate scores in West African School Certificate Examination

[41]The M-Scales have two versions, one for males and the other for females. The hypotheses developed here refer differently to males and females. No combination of scores is envisaged by the nature of these hypotheses statements, as the nature of the M-Scales precludes this possibility.

(the WASC-S)[42] between groups A and B fifth formers for either males or females.

The M-Scales sub-tests are said to investigate different aspects which relate to academic motivation. The Generalized Situational Choice Inventory (GSCI) is said to measure directly the academic motivation of the individual. The items involved are concerned with continuing one's education, getting better grades, and the like. A high score on this GSCI sub-test is an indication of concern for academic excellence.

The Preferred Job Characteristic Scale (PJCS) is said to measure the job preferences of individuals who are high or low on academic motivation. To secure and hold a high occupation presupposes an academic background of a sort. If, for instance, respondents are required to choose between (a) a job which does not tie one down, and (b) a job where one could continue to learn the rest of one's life; or (a) a job where one could be known for outstanding accomplishments, and (b) a job which does not require a university education, the nature of their choices is an indirect measure of their concern for academic excellence, assuming they consistently choose those items keyed in the direction of higher motivation.

The Word Rating List (WRL) on the other hand relates one's self-concept to academic motivation. The individual is instructed to react to stimulus words as he thinks his teachers would about him. Thus, the student who feels that he is thought of not as clever, studious, or serious might be different from the student who feels he is thought of as clever, studious, or serious. Since there are 72 such stimulus

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[42] Infra, p. 30.

words, the consistency of choice a student maintains provides a measure of his academic motivation. It should be observed here that responses are judged on whether or not they are in the direction of higher motivation. Relating the responses to the teacher perhaps helps focus attention on the school and academic considerations.

Finally, the Human Trait Inventory (HTI) is said to relate personality characteristics to academic motivation. Thus, given two students one of whom says, "I like to study always," and another who says, "I never like to study," it is possible to hold tentatively that the former's personality is attuned toward academic motivation while the latter's is not. If both are consistent in the pattern of their choices of items, the conclusion would be that their personalities differ in matters academic in nature.

Since the sub-tests of the scale are investigating different aspects which relate to academic motivation, the use of the M-Scales total scores alone might mask the finer discriminations of the sub-tests; hence the following hypothesis will be tested:

3. There is no significant difference in mean scores on the four sub-tests of the M-Scales between groups A and B fifth formers for either males or females.

Other variables apart from the nature of subsistence economy might be operating within the samples. From the research literature, as shown in Chapter II,[43] it is possible to isolate the following variables as featuring in one form of achievement motivation research or the other:

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[43] Infra, p. 36ff.

i. Social status of parents. The index of social status is worked out by combining occupation with education weights.

ii. Religious affiliation of parents. A given religion is generally believed to generate a specific world view in its adherents.

iii. Intelligence of either parents or the students. Academic performance is related to intelligence as well as to achievement motivation. Most studies have investigated the question of high or low intelligence versus high or low achievement motivation.

iv. Aptitudes and school attainment of students.

One can also think of other possible variables not included in the above list, such as the variables of the nature of one's extended family and the separation of children from their families.

The extended family system was considered difficult to investigate because it is a phenomenon that ramifies on both the mother's and the father's sides. One's maternal and paternal uncles, for instance, are regarded as part of one's extended family. It is not easy to think of anyone who does not belong to an extended family in the Nigerian context. In other words, it is difficult to form two groups of those who belong and those who do not belong to extended families for comparative analysis; hence this variable was dropped in this study.

The question of separation of children from their parents was considered. From the responses, only very few children agreed that they were separated from their natural parents. In Ibo society

child-bearing is considered a special blessing from God. Very rarely do parents agree to part with their offspring, not even in the divorced state. Those who agreed that they were separated from their parents were mostly non-Ibos who are not considered in this study anyway.

After some thinking on the matter the author decided to work with variables already established as important along with the variable of location of school. This last variable was suggested by the attitude of parents in persistently wanting to send their children to urban schools in East Central State. This persistence raises the question: Do parents want to send their children to urban schools as a result of their academic achievement motivation or some other consideration? In other words, do those who insist on going to urban schools possess more academic achievement motivation than those who are content to stay in rural schools?

As noted earlier, intelligence and aptitude scores are seldom available in Nigeria, nor have these instruments been standardized to measure these traits among the Ibos. Therefore, this study dealt with the education of parents, the religion of the students, and the location of their school as subsidiary variables to food area to which a student belongs. The hypotheses tested in this section of the study were:

4. There is no significant difference in the means of the total M-Scales scores between Catholics and Protestants for either males or females.
5. There is no significant difference in mean aggregate scores in West African School Certificate Examination

(WASC-S) between Catholics and Protestants for either males or females.

6. There is no significant difference in mean scores on the four sub-tests of the M-Scales between Catholics and Protestants for either males or females.
7. There is no significant difference in the means of the total M-Scales scores between students of educated and uneducated parents for either males or females.
8. There is no significant difference in mean aggregate scores in West African School Certificate Examination (WASC-S) between students of educated and uneducated parents for either males or females.
9. There is no significant difference in mean scores on the four sub-tests of the M-Scales between students of educated and uneducated parents for either males or females.
10. There is no significant difference in the means of the total M-Scales scores between male students[44] who attend urban and rural schools.
11. There is no significant difference in mean aggregate scores on the West African School Certificate examination between male students who attend urban and rural schools.
12. There is no significant difference in the mean scores on the four sub-tests of the M-Scales between male students who attend urban and rural schools.

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[44]Only five girls showed up in the urban sample; hence it was not possible to compare results by sex.

To accomplish the second objective of the study the hypothesis tested was:

13. The M-Scales scores will predict WASC-S better than chance, both with and without control.

The third and fourth objectives deal with determining the factorial structure of the responses of the Ibo fifth formers to the Generalized Situational Choice Inventory (GSCI) designed to test academic motivation, and to compare the findings with those already found out for whites and Afro-Americans in the United States. The operative hypothesis, therefore, became:

14. There is no difference in factorial structure between the fifth formers' responses to the GSCI and the responses of American whites and Afro-Americans on the same instrument.

## Summary

This study involved two Ibo groups. Group A derives from the heartland where man-land ratio is very high and the pressure on the individual to eke out his own living is acute. Group B derives from the fringe areas where there is less pressure on the land and consequently more food is available to the inhabitants than in the heartland. These two areas are different in modes of socialization of the individual. It was thought that these two differing modes of socialization and adaptation in the Ibo sub-groups might produce a differential need for achievement motivation as a psychological trait in the children of the two areas and that this would show up when an objective and sensitive instrument was applied to both of them.

A previous study by LeVine drew samples from Onitsha students only and made use only of projective techniques. That study was different from this in four ways: (1) the present study used objective measures instead of the projective; (2) this study was concerned with the Ibos alone as against the inter-ethnic comparisons made by LeVine; (3) LeVine studied students' fantasy need achievement without reference to performance criterion, whereas this study employs such a criterion; and (4) the Onitsha sample that was featured in LeVine's study was from the heartland, and would, therefore, be biased in favor of group A, in terms of the present research.

Four objectives provided scope for the present study, namely: (1) the exploration of the differences in academic achievement motivation between groups A and B Ibos; (2) the use of the M-Scale scores as predictors of academic achievement; (3) the study of the factorial structure of academic achievement motivation of the fifth form boys and girls; and (4) the comparison of the resulting factors with those found for American whites and blacks.

The theoretical background of the problem was derived from the McClelland-Farquhar theory of academic motivation.

## Definition of Terms Used

Human motives. The concept of human motives, as seen in this study, is the same as given by McClelland, who viewed human motives as a number of affectively toned associative chains (highly charged feelings that are focused on values of profound interest) arranged in a hierarchy, that is, dotted as it were on a chain in order of

importance to the individual. At the top of the hierarchy for a given individual is that associative chain (link) which is cued off most easily by almost anything that happens to him and which has the largest network of connectives with other thoughts. Thus, if money, or power, or achievement is at the top of an individual's hierarchy of motives every thought of his relates easily to it. Most of his life is occupied thinking about it. The other motives not so charged may be cued off by other thoughts but not so easily.

Need achievement motivation. This term is interpreted as a form of human motivation dealing specifically with achievement. A person who has it thinks of achievement most of the time. In itself, it is an underlying personality characteristic which involves a learned predisposition (cultural patterning) to attain success in competition with an internalized standard of excellence. This term is synonymous with n-achievement or just achievement motivation.

Academic achievement motivation. This term is used to mean that aspect of need achievement motivation which relates specifically to school achievement. It is the motive to explore, manipulate, organize, and provide the impetus for learning about important features of the school as a specific environment. Farquhar's[45] definition which sees this term as a combination of forces which initiate, direct, and sustain behavior toward a scholarly goal would convey the same idea. Operationally, the scores a subject obtains from the M-Scales are a measure

[45]William W. Farquhar, "Motivational Factors Related to Academic Achievement: Summary, Conclusions and Discussions." (Mimeographed.)

of his academic achievement motivation. In its shortened form, it is referred to as academic motivation.

Academic achievement. Academic achievement was interpreted to mean school performance. In the present study, it refers to the aggregate scores which an individual obtained after taking the West African School Certificate Examinations.[46]

Fifth formers. These are students in their fifth and final year of secondary school after completing a six-year primary school. They are regarded as the equivalent of the American eleventh graders for the purpose of comparison in this study.

WAEC. This means the West African Examinations Council. It has its headquarters in Ghana. It is concerned with preparing or approving school syllabi, setting and marking of examinations for the secondary school leaving certificate, and conducting other examinations.

WASC. West African School Certificate. This is the certificate a successful candidate obtains at the completion of his secondary school career.

WASC-S. This is interpreted in this study to mean the aggregate score a candidate obtains after taking the West African School Certificate Examinations at the end of a five-year secondary school. This aggregate score determines the grade of pass which a candidate attains.

GCE. General Certificate of Education. This certificate is a consolatory one awarded by the WAEC to borderline students. To get it, one has to have at least three passes and a credit in the subjects

[46] Infra, p. 30.

offered for examination. It does not have the same meaning as the GCE awarded by London University on different considerations.

Pass grades in WASC. After marks have been awarded by individual markers of student scripts on various school subjects, the "Awards Committee" of the WAEC (chief examiner, syllabus panel member, school examinations committee member, and WAEC officials) arranges the scores on a nine-point scale. The cut-off point for failures is determined when the chief examiner's report is studied and comparison is made with previous years' results. The number that fails in a given year in a given subject is determined by the cut-off score. When the failing mark is thus determined, the rest of the marks within the remaining range are distributed on an eight-point scale. See Appendix C, and pages 84 and 85 for further details.

M-Scales.[47] This is a battery made up of four sub-tests devised in Michigan State University to measure the academic achievement motivation of youngsters. The items are based on the McClelland-Farquhar bipolarized theory of academic achievement motivation. The technique of construction is the forced-choice variety. The items are scored in the direction of higher motivation. The assumption is that the highly motivated subject will choose differently from the lowly motivated. The four M-Scales have male and female versions because approximately 75 percent of the items are common to the sexes, while 25 percent are not.

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[47] Description of this Scale is based on that of Farquhar. See W. W. Farquhar, "Motivational Factors Influencing Academic Achievement of Eleventh Grade Puerto Rican High School Students" (East Lansing, Michigan: Educational Publication Services, College of Education, Michigan State University, 1967), pp. 14-15.

GSCI. This means Generalized Situational Choice Inventory. It consists of 53 items for males and 46 for females. The items describe situations logically related to the polarized version of the McClelland-Farquhar theory. A high score on this test indicates an individual who has a high need for academic achievement and would generally like the kinds of tasks and activities that schools would value as part of the academic program.

PJCS. The Preferred Job Characteristic Scale. This Scale was constructed to set up extremes in occupational motivation as logically typified by the polar theory of academic motivation. It measures academic motivation indirectly. A high score on it indicates a high academic motivation since a high occupational position, other things being equal, depends on high academic status.

WRL. The Word Rating List. This test was originally structured to measure the "looking glass self." The items were selected by extracting descriptive words and phrases from self-concept literature and from the review of personal, motivational, and intellectual characteristics of students representing extremes in academic performance. The items are rated on a four-point scale (never, sometimes, usually, and always). For each item the subject is asked to rate the way he thought his teacher would typically describe him if she were to use the descriptive phrases. A high score indicates high academic motivation.

HTI. The Human Trait Inventory. This test consists of 50 items for males and 60 items for females which measure personality characteristics already established by previous studies. These personality characteristics relate to level of achievement which may be

low, high, or discrepant. The same four-point scale of never, sometimes, usually, and always is used.

Heartland. In this study, the heartland is referred to as the supposed dispersal center of the Ibo ethnic group, with higher man-land ratio than in the other areas. Group A typically derives from the heartland.

Fringe. Fringe refers to all Ibo occupied areas away from the heartland, relatively rich in agriculture and having lower man-land ratio than in the heartland. Group B students typically derive from the fringe areas.

Urban school. An urban school in this study is any school located in any town designated urban by the East Central State government.

Rural school. A rural school in this study is any school located in towns and villages not accorded urban status by the East Central State government. These designations take into account population numbers, the variety or quality of the population, the variety and quality of services that can be rendered, and a host of other considerations.

Subsistence economy.[48] This term was interpreted to mean peasant agriculture and rural animal husbandry of an unscientific nature with or without hunting and fishing as supplements to eke out a living.

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[48]To an economist and some other social scientists, this term implies not only a low standard of living, but also one based entirely upon the material fruits of one's labor; that is, no participation in the monetary market economy. It is not used in this sense in this study.

Improvement unions. These are cooperative types of associations formed by members of particular villages, village groups, or ethnic groups. The purpose, according to Huth,[49] is to provide socialization, guidance, assistance, and discipline among members at the "foreign post," the ultimate and most important purpose being the betterment of the home village or ethnic group.

High food accumulation. The characteristic index of this is the marketing of food surpluses throughout the year; crops involved are mainly yams, cocoyams, cassava, and rice.

Low food accumulation. The characteristic index is buying of foodstuffs to augment the meagre proceeds from one's own farm.

Open social system. This was interpreted to mean a system of upward mobility which allows the individual to attain self-fulfillment without traditional or institutional hindrances except those hindrances posed by individual intelligence and capacities.

Ex post facto research. This term was interpreted here according to the definition given to it by Kerlinger.[50] He defined ex post facto research as that research in which the independent variable or variables have already occurred and in which the researcher starts with the observation of the dependent variable or variables. He then studies the independent variables in retrospect for their possible relations to the dependent variable or variables.

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[49] Huth, op. cit., p. 287.

[50] Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1964), p. 360.

Projective techniques. This term was interpreted to mean those techniques or instruments based on the principle that the individual will reveal his deepest characteristics and feelings when his behavior is most unrestricted and the situation unstructured. A wide variety of reactions is possible, and must be interpreted in terms of the total response pattern. Such tests may be scored objectively to some extent, but both the administering of the test and test interpretation involve a number of subjective evaluations which depend for their validity largely upon the skill and experience of the person giving the test.

Objective techniques. As applied to behavior, this term was used to mean those techniques or instruments which involve behavior in a standardized situation. In them, the individual being tested is expected to give a particular type of response to a structured situation within the limits of which only a minimum number of responses are possible. Such tests are scored objectively, the answers being either "right" or "wrong," and the total score becomes the basis on which interpretation of the individual's status is made.

# CHAPTER II

## REVIEW OF LITERATURE ON ACHIEVEMENT MOTIVATION

This chapter looks at research linking achievement motivation with academic performance of students. It reviews both projective-type studies and those concerned with objective measures. It adduces research evidence which indicates that one type of instrument is preferable to the other. The review touches specifically on antecedents of achievement behavior, parental influences on achievement behavior, relation of need achievement to performance, and the relationship of the M-Scales scores to academic achievement.

Apart from the study by LeVine[1] already mentioned, a review of the literature shows virtually no study of Ibo students on achievement motivation and its relation to school performance. The review that follows deals with studies considered relevant but which were conducted elsewhere, and on different samples of students.

### Antecedents of Achievement Motivation and Behavior

Many studies, reviewed by Crandall,[2] have dealt with three categories of antecedent factors influencing achievement motivation,

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[1] LeVine, op. cit.

[2] Most of the reviews in this section are taken from V. J. Crandall, "Achievement," in The Sixty-Second Yearbook of the National Society for the Study of Education, Pt. 1 (Chicago: University of Chicago Press, 1963), pp. 422-42.

namely: cultural-social factors, parental influences, and relation of need achievement to performance.

## Cultural-Social Factors

In terms of cultural-social factors, it has been found that the general cultural milieu into which a child is born affects the development of his achievement motivation and behavior. For instance, there is a marked difference between the achievement behaviors of children born in two differing communities--one highly competitive, the other less competitive. Sex, racial, religious, and ethnic background, and the socio-economic class to which one's family belongs are said to affect his achievement motivation and behavior. In the study by McClelland and Friedman[3] of North American Indian tribes, their folktales indicated strong need for achievement; the socializing agents initiated independence training earlier and rewarded self-reliant activities and punished the lack of such efforts to a greater degree than did tribes who were less concerned with achievement. However, not all research is consistent in associating socio-cultural factors with need achievement, especially those that use the projective technique as a method of investigation. For example, Child, Storm and Veroff[4] compared 46 preliterate cultures and their finding showed few significant

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[3] D. C. McClelland and G. Friedman, "A Cross-Cultural Study of the Relationship Between Child-Training in Folktales," in Readings in Social Psychology, ed. by G. Swanson et al. (New York: Henry Holt and Co., 1952).

[4] I. Child, T. Storm, and J. Veroff, "Achievement Themes in Folk Tales Related to Socialization Practices," in Motives in Fantasy, Action and Society, ed. by J. W. Atkinson (Princeton: D. Van Nostrand Co., Inc., 1958), pp. 479-92.

associations between cultural need achievement as evidenced in common folktales and the cultures' prevailing child-rearing practices.

In some cultures, boys are known to receive more achievement training than girls. Barry, Bacon, and Child[5] in a cross-cultural survey compared child-rearing practices in several societies and found that boys received more achievement training in most of the cultures studied than girls. The findings of Sears, Maccoby, and Levin[6] are similar.

Racial, religious, and ethnic backgrounds have been found to relate to achievement motivation development. The influence of religious ethics upon social activity has been demonstrated in Max Weber's[7] The Protestant Ethic and the Spirit of Capitalism. Weber's "Protestant Ethic" is in a way a model of achievement ethics. His thesis as summarized by Parsons[8] consists of four main propositions:

1. The Calvinist belief in God as absolutely transcendent and inscrutable excluded the possibility of a mystical union with the divine spirit.
2. The Calvinist belief that the world was God's work, set in motion by decisions which last for eternity, encouraged

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[5]H. Barry, M. Bacon, and I. Child, "A Cross-Cultural Survey of Some Sex Differences in Socialization," Journal of Abnormal and Social Psychology, LV (1957), 327-32.

[6]R. Sears, Eleanor Maccoby, and H. Levin, Pattern of Child Rearing (Evanston: Row Peterson and Co., 1957).

[7]Max Weber, The Protestant Ethic and the Spirit of Capitalism, trans. Talcott Parsons (New York: Scribner, 1948).

[8]Talcott Parsons, The Structure of Social Action (Glencoe, Illinois: Free Press, 1949).

faith in the order of nature and the development of rational science.

3. The Calvinist belief that man was by nature sinful and that it was man's duty to labor to suppress this sinfulness led to an ascetic dedication to duty.

4. The Calvinist belief that man was predestined to be saved or damned created an anxiety to know one's status, an anxiety which was transferred into social activity in the belief that worldly success would identify the chosen.

Strodtbeck[9] summarized this thesis as follows:

> Taken together, these religious premises shaped both a conception of the external world and a way of relating one's self to it. It was a system in which there were no priestly intercessors; it involved a relationship between God and Man so intense and exclusive as to result in both a devaluation and mistrust of human relationship. Most important, there was, along with this "inner isolation of the individual," a dedication to duty from dawn to dusk which served the development of both science and early capitalism.

In two studies, Strodtbeck[10] and Rosen[11] have shown that religious, racial, and ethnic backgrounds relate to achievement. Strodtbeck compared third-generation Italian and Jewish adolescent boys and their parents. It was found that Jewish parents usually held higher occupational and educational aspirations for their sons than

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[9] F. Strodtbeck, "Family Interaction, Values and Achievement," in Talent and Society, ed. by D. C. McClelland, A. Baldwin, U. Bronfenbrenner, and F. Strodtbeck (Princeton: D. Van Nostrand Co., Inc., 1958), pp. 135-94.

[10] Ibid.

[11] Bernard Rosen, "Race Ethnicity, and the Achievement Syndrome," American Sociological Review, XXIV (1959), 47-60.

did Italian parents. They also expressed greater preferences for individual rather than collective credit for work done, and more often espoused the belief that an individual can and should make specific plans to control his own future. Rosen also compared achievement attitudes of French Canadians, Italians, Greeks, Jews, Negroes, and White Protestants. The general thesis of the study was that racial and ethnic groups in America differ markedly in their achievement orientations, and that this may be one factor operative in their upward social mobility. The prediction was that Jewish, Protestant, and Greek mothers would place a higher premium on educational achievement for their sons than French-Canadian, Italian, and Negro mothers. With the exception of Negro mothers, this was found to be so. In terms of vocational aspirations, Jewish, Greek, Protestant, Italian, and French-Canadian mothers held for their sons vocational aspirations in that descending order of magnitude. While social-class status was also found to be associated with these maternal aspirations, it was not as highly related as was ethnicity per se. This study also evaluated differences in independence training. Jewish mothers expected the earliest evidence of self-reliance from their boys, followed by Protestants, Negroes, Greeks, French-Canadians, and Italians. Finally the boys' needs for achievement motivation would be relatively high among Jews, Greeks, and Protestants, and lower for the Italian, French-Canadian, and Negro boys. This prediction was generally supported, but in this case social class accounted for more variance than did ethnicity.

As for parental social class and its association with the need achievement development of the children, Crandall[12] thinks that children of families of higher socio-economic status are usually higher in achievement than peers from families occupying lower social class positions.

A study of Onabamiro[13] throws doubt on this reasoning as applied to Nigeria. In his "Disappointing Sons of Eminent Fathers," Onabamiro points out that in Nigeria today, scores of fathers who have achieved notable success in the professions, in business, or in the civil service are having trouble with their children. The children are not making the grade in comparison with the children of the less successful fathers who have not had the same material advantages.

Onabamiro explains this with the hypothesis that the nature of upbringing of fathers and their sons is different. The upbringing of the present fathers was rigorous and highly motivated by the early missionaries--which attributes they might have failed to bring to bear on the upbringing of their own children. Four factors militating against the progress of the "problem-children" are discussed, namely: suffocating affection, rigid regimentation, inherited mental defects, and absence of motivations. For suffocating affection, Onabamiro observes:

> The first thing uppermost in the mind of the self-made successful parent is to make sure that his children do not undergo the harsh conditions of his own childhood, completely forgetting how those

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[12]Crandall, "Achievement," op. cit.

[13]Sanya Onabamiro, "Biological Reflections: Disappointing Sons of Eminent Fathers," Sunday Times, December 3, 1972, p. 11.

very conditions had materially contributed to his success in life. . . .

At the age of two years his little son must cease to walk barefooted. At three the little boy is bundled to a nursery school. At eight a regular lesson teacher comes to the house to give special coaching. The boy is well fed, well shod, well clad, but that is all. All the adventures that should pack the early years of a boy to stimulate vigorous development have been assiduously eliminated by the over-anxious father.

While boys of his age are hunting squirrels, fishing in streams, and downing sluggish birds with their penny rubber catapults our little Kunle is cooped up in the house doing lessons or helping mummy to serve visitors. Fearing like poison "the corrupting influence" of ruffians in the outside world, the mother keeps Kunle in her sight all the time.

This and the other three factors, according to Onabamiro, account for the failure of a number of Nigerian sons to measure up to the expectations of their fathers.

Parental Influences

One's parents are his major socializing agents. It is of interest to know in what ways parents shape the development of their children's achievement values, standards, expectations, and behaviors. Investigations by Crandall, Preston, and Rabson,[14] McClelland, Atkinson, Clark, and Lowell,[15] Winterbottom,[16] and Rosen and D'Andrade[17]

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[14]V. J. Crandall, Anne Preston, and Alice Rabson, "Maternal Reactions and the Development of Independence and Achievement Behavior in Young Children," Child Development, XXXI (1960), 243-51.

[15]McClelland et al., op. cit.

[16]Marian Winterbottom, "The Relation of Need for Achievement in Learning Experiences in Independence and Mastery," in Motives in Fantasy, Action and Society, ed. by J. Atkinson (Princeton: D. Van Nostrand Co., Inc., 1958), pp. 453-78.

[17]B. Rosen and R. D'Andrade, "The Psychosocial Origins of Achievement Motivation," Sociometry, XXII (1959), 185-218.

have shown that parents' orientations toward their own achievements may influence their behaviors with their children in everyday achievement experiences. Particularly interesting here is the study by McClelland and his colleagues which reports significant associations between parental affection or rejection and their children's need achievement motivation. Using the Thematic Apperception Test (TAT) stimuli on both college and high school students, they found that college males with high n-achievement rated their parents as more rejecting than did males who were less preoccupied with achievement. On the other hand, high school boys with strong need achievement motivation rated their fathers as less rejecting than did their low n-achievement peers. Here one encounters one of the inexplicable results of the projective technique. Why there should be a difference between the rejecting behaviors of fathers of college males and high school males is not apparent. It may well be that extremes of "suffocating affection" and rejection are both bad in the need achievement development of youngsters. Perhaps, it is difficult to assess the importance of acceptance and rejection in the genesis of achievement development unless account is taken of "extremes."

Six studies by Conklin, Jones, Kimball, Rickard, Tibbets, and Walsy[18] suggest that closeness to the child, high interest, understanding,

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[18]A. Conklin, Failures of Highly Intelligent Pupils: Teachers College Contributions to Education, No. 792 (New York: Teachers College, Columbia University, 1940); E. Jones, "The Probation Student: What He Is Like and What Can Be Done About It," Journal of Educational Research, XLIX (1955), 93-102; B. Kimball, "Case Studies in Educational Failure During Adolescence," American Journal of Orthospychiatry, XXIII (1953), 406-15; G. Rickard, "The Relationship Between Parental Behavior and Children's Achievement Behavior" (unpublished Ph.D.

and/or approval of him are conducive to competent academic achievement.

In contrast to the findings of these investigations three other studies by Drews and Teahan,[19] by Crandall, Dewey, Katkousky, and Preston,[20] and by Hoffman, Rosen and Lippett[21] suggest that high academic achievement may be associated with negative parental behaviors, such as rejection, coerciveness, and/or overprotection. Drews and Teahan found that mothers of high-achieving junior high school students, in contrast with mothers of children who were performing less adequately, express more punitive attitudes toward child disobedience and are more rejecting of their offspring. Crandall et al. stated that

> Girls who were especially competent readers had both less affectionate and less nurturant mothers than did girls who demonstrated less proficiency in this academic area. . . . In addition, girls who performed better on the arithmetic achievement test had mothers who were also relatively low on nurturance.

One can only conclude from the above that studies to date are inconclusive on the question of degree of rejection or acceptance.

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dissertation, Harvard University, 1954); J. Tibbets, "The Role of Parent-Child Relationship in the Achievement of High School Pupils," Dissertation Abstracts, XV (1955), 232; A. Walsh, Self-Concepts of Bright Boys With Learning Difficulties (New York: Teachers College, Columbia University, 1956).

[19]Elizabeth Drews and J. Teahan, "Parental Attitudes and Academic Achievement," Journal of Clinical Psychology, XIII (1957), 328-32.

[20]V. Crandall, Rachel Dewey, W. Katkousky, and Anne Preston, "Parents' Attitudes and Behaviors and Grade School Children's Academic Achievements," Journal of Genetic Psychology (n.d.), taken from Crandall, "Achievement," op. cit.

[21]Lois Hoffman, S. Rosen, and R. Lippett, "Parental Coerciveness, Child Autonomy, and Child's Role at School" (study reported at Meeting of American Psychological Association, 1958).

Overacceptance or overrejection may both be productive of negative achievement disposition; or other factors, such as age, may be more important.

Relation of Need Achievement to Performance

Need achievement as a predictor of academic performance has been copiously employed in achievement research. It has been found by Kausler and Trapp[22] to be related to aspiration level, by French and Thomas[23] to be related to problem-solving effectiveness, and by Weiss, Wertheimer, and Grossbeck[24] to be related to academic achievement. Winterbottom[25] found out that children who scored high on an achievement motivation test were equally rated high by their teachers in terms of participation in sports and schoolwork. Such high children were also found to be more independent in their problem-solving attempts and evidenced greater pleasure when successful in achievement efforts. Rosen and D'Andrade[26] in another study used 40 boys matched for age, race, I.Q., and social class. Twenty of them were high and the other 20 low

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[22]D. Kausler and E. Trapp, "Achievement Motivation and Goal-Setting Behavior on a Learning Task," Journal of Experimental Psychology, LV (1958), 575-78.

[23]Elizabeth French and F. Thomas, "The Relation of Achievement Motivation to Problem-Solving Effectiveness," Journal of Abnormal and Social Psychology, LIV (1958), 45-48.

[24]P. Weiss, M. Wertheimer, and B. Groesbeck, "Achievement Motivation, Academic Aptitude, and College Grades," Educational and Psychological Measurement, XIX (1959), 663-66.

[25]Winterbottom, op. cit.

[26]Rosen and D'Andrade, op. cit.

in need achievement motivation. Several achievement tasks were administered to each boy in his own home while his parents were present. The high need achievement boys were found to be more proficient on the tasks, asked for less aid from their parents, were more competitive, and displayed greater self-reliance in general.

Eric Klinger[27] has shown the difficulties involved in the projective measure of need achievement and its relationship to performance. He pointed out that most studies employ correlational techniques and fail to interpret the results adequately. Performance on laboratory tasks such as undergraduate course work, he maintained, is determined by many factors, of which achievement motivation is only one. One might expect, in his view, that the relationships between need achievement and performance measures should be at most moderate, and perhaps low, even granting the motivational status of need achievement. Then, also, the relationships might be nonlinear, perhaps nonmonotonic. Such an eventuality, believed Klinger, would further depress the observed association between need achievement and performance in studies which limit their analyses to linear correlation coefficients.

Klinger divided evidence concerning the relationship of fantasy need achievement scores and performance into two classes--molar and task. The molar class is determined according to whether the performance variable is relatively long-term behavior patterns measured by course, grades, grade averages, and ratings for long-term behavior patterns. On the other hand the task class is determined according to whether the

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[27]Eric Klinger, "Fantasy Need Achievement as a Motivational Construct," Psychological Bulletin, LXIV (1966), 291-308.

performance variable is measured by task instruments that involve only brief segments of behavior and often administered at the same time as the testing of need achievement motivation. Rosen's[28] study, previously discussed in another connection, falls into this task class. He created experimental situations involving five tasks with the express intention of finding out parents' responses to their sons as they engaged in achievement behaviors. Tasks were devised which the boy could do and which would involve the parents in their son's task performance. The tasks were constructed so that the parents were often faced with a choice of giving or refusing help. The observation of the parents' behavior as their son engaged in these experimental tasks (block stacking, anagrams, patterns, ring tossing, and hat rack) provided information about the demands and the amount of independence the child had developed in relations with his parents.

As for studies linking need achievement to molar performance, Klinger cited studies by Cox, Crootof, Kagan, Rosen, and Shaw.[29] He observed that overall, about as many reported relationships fail of statistical significance (P = .05) as achieve it. He went further to observe that two variables determine much of the pattern of hypothesis

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[28]Rosen and D'Andrade, op. cit.

[29]F. N. Cox, "An Assessment of the Achievement Behavior System in Children," Child Development, XXXIII (1962), 357-64; C. Crootof, "Bright Under-Achievers Acceptance of Self and Their Need for Achievement," Dissertation Abstracts, XXIV (1963), 1695-96; J. Kagan and H. Moss, "Stability and Validity of Achievement Fantasy," Journal of Abnormal and Social Psychology, LVIII (1959), 357-64; B. C. Rosen, "The Achievement Syndrome," American Sociological Review, XXI (1955), 203-11; M. C. Shaw, "Need Achievement Scales as Predictors of Academic Success," Journal of Educational Psychology, LII (1961), 282-85.

confirmation and disconfirmation. One of these is sex. Studies employing female subjects overwhelmingly report lack of relationship between fantasy need achievement and molar performance measures. The second variable is age. Nine of the ten relationships involving males of high school age or younger were reported to be significant in the studies he reviewed, while 9 of the 16 relationships involving college-age and adult males were reported to be nonsignificant. Klinger noted that nothing in the existing theoretical structure of achievement motivation suggests such an age-related difference.

As for studies which measure the performance variable through task instruments, Klinger reviewed as many as 35 studies and found that approximately half of the studies reported predominantly significant relationships, and half nonsignificant ones with a different pattern of hypothesis confirmation from that in the first molar case. In this regard Klinger observed as follows:

> The studies of task performance suggest that results depend partly on need achievement instrument, in that the French Test of Insight produced nearly uniformly significant results, whereas both the TAT and IPIT measures of need achievement produced more nonsignificant than significant results. The studies also suggest an interaction of Instrument [with] Sex of Subject, in that of the studies that used the TAT, a higher proportion of those with male subjects reported significance than those with females, while the reverse was true with the IPIT. Also unlike the studies [employing molar performance], subjects' age had no apparent bearing on the significant results. The lone study that reported results for male children yielded nonsignificance. The overall pattern of results can only be described as puzzling. They shed little light on the motivational status of need achievement.

This review of projective techniques with regard to achievement motivation has kept researchers alert to their lack of internal consistency, lack of test-retest reliability, their deficient validity

against performance criteria, and the low intercorrelations among several projective need achievement measures--a fact which Hofmann[30] demonstrated in a multitrait-multimethod matrix study, investigating the construct validity of certain need achievement scales. He concluded that the projective methods were less adequate than the objective methods of measurement.

Hermans[31] pointed out that questionnaire measures of need achievement have also proven unsatisfactory, especially those whose initial item pool was made carelessly; that is to say, items pooled without regard to underlying theory. He observed that the achievement motive is likely a relevant variable for some kinds of performance. It subsumes a number of different behavioral aspects under one construct. This, Hermans noted, imposes heavy requirements on the representativeness and validity of the initial item pool for this trait.

## Relation of the M-Scales Scores to Academic Achievement

Since Klinger[32] and Hermans[33] have pointed out the unsatisfactory nature of both projective measures and previous questionnaire techniques, respectively, attention has been focused on the M-Scales, whose development Farquhar[34] has described in his "Integrated Research

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[30]Louis J. Hofmann, "An Application of the Multitrait-Multimethod Matrix to the Study of the N-Achievement Construct (unpublished Ph.D. thesis, Michigan State University, 1965).

[31]H. M. J. Hermans, "Questionnaire Measure of Achievement Motivation," Journal of Applied Psychology, LIV (1970), 353-63.

[32]Klinger, op. cit. [33]Hermans, op. cit.

[34]William W. Farquhar, "An Integrated Research Attack on Academic Motivation," Journal of Counseling Psychology, IX (1962), 84-86.

Attack on Academic Motivation." Farquhar, Payne, and Thorpe, the original Michigan State University group, developed an objective instrument based on a motivational theory that, at least, was reliable. Their objectives were to develop:

a. a measure of academic motivation,

b. a theory-based and thus an interpretable instrument,

c. an easily administered and scored instrument,

d. a device built upon fruitfulness of theory that would permit exploration of the motivational complex, and

e. an objective measure screened through external validating groups.

These objectives resulted in a research design that was supported by the U.S. Office of Education (Project No. 846). The final instrument, the M-Scales,[35] consisted initially of 139 male and 136 female items. As reported, the reliability estimates using Hoyt's[36] variance analysis technique ranged from .60 to .90 for the four subtests calculated on major and sub-groups. The total scale reliability estimate using the same variance technique was .94 for males and .93 for females. The validity estimates of the M-Scales total scores against grades were .56 for males and .40 for females.

As Hermans[37] had observed earlier, projective techniques and earlier objective measures of academic motivation have not been able

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[35] See definitions section, p. 31.

[36] Cyril Hoyt, "Test Reliability Estimated by Analysis of Variance," Psychometrika, VI (1941), 153-60.

[37] Hermans, op. cit.

to report reliability and validity figures as high as these. However, in studies using the M-Scales, these figures are approximated in study after study, thus demonstrating the stability of the M-Scales as an academic motivational instrument.

## M-Scales in Cross-Cultural Studies

Since the original work on Caucasians, a number of cross-cultural studies using the M-Scales have been undertaken. Green[38] investigated the relationship of personality and cognitive factors with academic achievement (GPA) for eleventh-grade Negro and white students of both sexes. He randomly selected 233 Negro and 515 Caucasian high school students of both sexes, and collected M-Scales scores, aptitude measures from the Cooperative School and College Ability Tests-Verbal (SCAT-V)[39] and grade point averages information on both samples. The objectives of the study were concerned with the predictive efficiency of the M-Scales as applied to Negro samples and with the factorial structure of the responses of the Negro samples on the M-Scales. The results showed a significant difference between Negro and Caucasian males and females on one sub-test, the Generalized Situational Choice Inventory (GSCI),[40] with Negro students achieving

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[38]Robert Lee Green, "The Predictive Efficiency and Factored Dimensions of the Michigan M-Scales for Eleventh Grade Negro Students--An Exploratory Study" (unpublished Ph.D. thesis, Michigan State University, 1962).

[39]The SCAT has both verbal and quantitative scores. The verbal score is derived from vocabulary items prepared in an analogies form that requires close analysis. Why Green left out the quantitative score was not explained.

[40]See definitions, p. 32.

higher mean scores. No difference in mean scores was found for the three remaining sub-tests. A significant difference was found in mean GPA among the four groups, with the whites achieving higher mean scores. No correlation (-.01) between verbal aptitude and achievement for Negro males was found despite the significant correlation between verbal aptitude and GPA for Negro females. All the sub-tests, except the Human Trait Inventory,[41] correlated significantly (.14) with academic achievement for both Negro males and females. The Word Rating List (WRL)[42] was the best single predictor of academic achievement for the Negro sample (.36 males and .64 females). Overall, the M-Scales total correlated significantly with achievement for all groups (.37 male Negroes and .55 female Negroes and .50 male whites and .43 female whites).

In another study, Uri Rueveni[43] used the M-Scales to explore differences in academic motivation and aptitude between Jewish and non-Jewish high school students; and between Jewish Conservative, Orthodox, and Reform students. The sample consisted of 388 Jewish and 369 non-Jewish male and female students selected from four high schools in the United States. Motivational, achievement, and aptitude

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[41]Human Trait Inventory is one of the sub-tests of the M-Scales. See definitions, p. 32.

[42]See definitions, p. 32.

[43]Uri Rueveni, "Academic Motivation in Jewish and Non-Jewish High School Students" (unpublished Ph.D. thesis, Michigan State University, 1966).

scores[44] were obtained for each student. The results of analysis of variance indicated that the four male groups differed significantly in academic motivation and aptitude. The four female groups differed significantly in the GSCI and aptitude only. Analysis of co-variance indicated that when aptitude was controlled, the four male groups differed significantly in academic motivation, while, except for the GSCI and M-Scales total, the four female groups did not differ in academic motivation. The Scheffe test[45] revealed that the Jewish male groups exceeded the non-Jewish males in academic motivation and aptitude, while except for the GSCI, the Jewish females did not differ in academic motivation from the non-Jewish females. Differences between the Jewish groups indicated the Orthodox male and female groups, each, to exceed the Conservative and Reform groups in academic motivation, achievement, and aptitude.

Van Johnson[46] worked with Caucasian and Indian samples. In his study, significant differences were found in GPA and aptitude test

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[44]For reasons not quite clear, Rueveni made use of four different aptitude tests for each of his four groups of students. It may well be that he assumed without demonstrating that the Differential Aptitude Verbal Reasoning, the School and College Ability Test-Verbal, the College Board Scholastic Aptitude Test-Verbal, and the Minnesota Scholastic Aptitude Test which he used for the different groups were comparable.

[45]The Scheffe test is a post-hoc comparison of means following a one-way analysis of variance. It considers pair-wise differences between means in order to determine which difference contributes to the overall significance of F. See William L. Hays, Statistics for Psychologists (New York: Holt, Rinehart and Winston, 1964), p. 484ff.

[46]Van Johnson, "An Assessment of the Motivational Factor in the Estimation of Academic Achievement of Eleventh Grade Indian Students and Factored Dimensions of the M-Scales--An Exploratory Study" (unpublished Ph.D. thesis, Michigan State University, 1963).

scores; the Caucasian samples had the higher score in each case. The Caucasian male sample recorded higher mean scores in the total score and all sub-tests of the M-Scales except in the Generalized Situational Choice Inventory (GSCI); t-tests indicated significant differences in all but the Preferred Job Characteristic Scale (PJCS) mean scores. The Indian female sample recorded significantly higher mean scores in both the GSCI and PJCS sub-tests. The regression analysis indicated the precision of estimation of GPA was significantly improved when M-Scale scores were added to the aptitude score in both the male and female Indian samples.

A study by McDonald[47] not only added evidence that when the M-Scales are combined with an aptitude measure the predictive efficiency is improved, but also indicated that socio-economic status does not predict academic achievement. His socio-economic status was composed of weighted contribution of education and occupation of parents. He reasoned that differences in results obtained by those who employ the socio-economic index in this type of research might be due to different methods of deriving the socio-economic indices.

Two studies by Pettigrew[48] and Hayden[49] have demonstrated that the M-Scales have little utility for college populations. Pettigrew,

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[47]Keith Henry McDonald, "An Investigation Into the Relationship of Socio-Economic Status to an Objective Measure of Motivation--The Michigan M-Scales" (unpublished Ph.D. thesis, Michigan State University, 1962).

[48]S. H. Pettigrew, "The Validation of an Objective Measure of Academic Achievement Motivation With Male College Freshmen" (unpublished Ph.D. thesis, Michigan State University, 1964).

[49]Mary L. Hayden, "The Validation of the Michigan State M-Scales With College Freshmen" (unpublished Ph.D. thesis, Michigan State Univerwity, 1963).

after gathering the usual data on each of 865 first-quarter freshmen at Michigan State University in 1961, employed the two-stage regression technique developed by Farquhar. Statistically defined samples of over- and under-achieving students were identified by regression analysis from their scores on the College Qualifying Test (CQT), Michigan State University Reading Test (MSU-R), and Grade Point Average (GPA). The criterion groups consisted of 115 over- and 106 under-achievers who were randomly divided into sub-samples for validation and cross-validation purposes. Responses to each item of the GSCI were analyzed using chi square. Five items were found in the direction of the theory after cross-validation. Two other significant items were in the direction opposite to that originally hypothesized. In view of the above, Pettigrew[50] concluded, as did Hayden[51] for the whole scale, that the GSCI items do not discriminate between over- and under-achievers in a male college freshman sample. This conclusion may have been brought about by restricted range within an already pre-selected sample, or else the M-Scales are inadequate for older subjects.

The validation studies reviewed so far show statistically significant results when M-Scale scores are correlated with GPA and aptitude measures, provided the subjects are of high school age and under. Since the samples of this present study are on a transitional point age-wise, that is, between high school and university, it will be interesting to watch the behavior of the M-Scales with these samples.

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[50] Pettigrew, op. cit. [51] Hayden, op. cit.

Factor Analysis as a Tool in Construct Validation

Fred Kerlinger[52] has defined factor analysis as a method for reducing a large number of measures to a smaller number of measures (factors) by discovering which measures "go together" and the relations between these clusters of measures that go together. In other words, it is a method of understanding a construct through its correlates. It tells us what tests measure the same thing and to what extent they measure what they measure.

Cronbach[53] defines construct validation as an analysis of the meaning of test scores in terms of psychological concepts. Every test, according to him, is to some degree impure, and very rarely does it measure exactly what its name implies. To determine whether a test does what its name implies necessitates some form of analysis. This has to be done, since a test cannot be interpreted until we know what factors determine scores. Cronbach outlines three important steps which are considered necessary in the analysis:

1. Suggesting what constructs might account for test performance. This is an act of imagination based on observation or logical study of the test (for example, factoring).
2. Deriving testable hypotheses from the theory surrounding the construct. This is a purely logical operation.
3. Carrying out an experimental study to test one hypothesis after another.

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[52]Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1964), pp. 453-54.

[53]Lee J. Cronbach, Essentials of Psychological Testing (3rd ed.; New York: Harper and Row, Publishers, 1970), pp. 142-43.

It is after the confirmation of these hypotheses that we begin to talk of the construct validity of a given test.

Professor Farquhar[54] has given the reason for factoring the M-Scales as (1) to empirically determine the homogeneity of the scales, and (2) to provide a psychologically meaningful interpretation of the item content groupings for re-theorizing about the nature of academic motivation. In other words, the aim was to focus attention on the construct validation of the M-Scales. It was to try to do this that a number of investigators had embarked upon factor analysis of some of the sub-tests of the M-Scales.

Apart from the Farquhar project number 846 already mentioned, a number of studies have proceeded with this kind of aim in view, notably those of Farquhar and Payne, Marian Thorpe, Richard Bland Smith, David Allen Payne, Fred Smith, Taylor and Farquhar, Van Johnson, and a good number of others.[55] Through these studies the factorial structures of

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[54]William W. Farquhar, "Motivational Factors Related to Academic Achievement: Summary, Conclusions and Discussions," p. 4. (Mimeographed.)

[55]William W. Farquhar and David A. Payne, "Factors in the Academic Occupational Motivations of Eleventh Grade Under- and Over-Achievers," APGA Journal, November, 1963; Marian Thorpe, "The Factored Dimensions of an Objective Inventory of Academic Motivation Based on Eleventh Grade Male Over- and Under-Achievers" (unpublished Ph.D. thesis, Michigan State University, 1961; Richard Bland Smith, "A Comparative Study of the Personality Factors Associated With Two Different Operational Definitions of Discrepant Achievement" (unpublished Ph.D. thesis, Michigan State University, 1963); David Allen Payne, "A Dimension Analysis of the Academic Self-Concepts of Eleventh Grade Under- and Over-Achieving Students" (unpublished Ph.D. thesis, Michigan State University, 1961); Fred Smith, "A Cluster Analysis of an Objective Measure of Academic Motivation" (unpublished Ph.D. thesis, Michigan State University, 1965); R. G. Taylor and W. W. Farquhar, "Personality Motivation and Achievement: Theoretical Constructs and Empirical Factors," Journal of Counseling Psychology, XII (1965), 186-91; Johnson, op. cit.

the responses of racial groups are beginning to emerge. For instance, Marian Thorpe, Green, and Johnson[56] have studied the whites, Negroes, and Indians, respectively, and thus showed what factors were common among the respondents and what factors were unique to each racial group.

Since one of the aims of the present study is to factor analyse the responses of the Ibo samples to the GSCI, it is left to be seen to what extent the resulting factors will corroborate other evidences or contradict them.

## Summary

LeVine's study, in Nigeria, provides the only available evidence on the need achievement motivation of the Ibos. The other reviews made were on the basis of relevance to achievement motivation generally.

From Crandall's review three categories of antecedent factors were delineated and discussed, namely: cultural-social factors, parental influences, and relation of need achievement to performance.

Eric Klinger's reviews highlighted the difficulties involved in employing the projective instruments to determine relationship between need achievement and performance. Such instruments, apart from showing inconclusive results for males and females and for certain age levels, were reported to lack internal consistency, to lack test-retest reliability, to have deficient validity against performance criteria, and to have low intercorrelations among several projective need achievement measures. Furthermore, Hermans pointed out that questionnaire measures

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[56]Thorpe, op. cit.; Green, op. cit.; Johnson, op. cit.

whose item constructions or selections were not based on a sound theory had also proven unsatisfactory.

These revelations led to considerations of the M-Scales and their relationship to academic performance. From available evidence, these instruments seem to possess potential on the need achievement/ academic performance research.

# CHAPTER III

## DESIGN AND TECHNIQUES OF ANALYSIS

This study is not a natural experiment but an ex post facto analytical study. In the natural experiment, the experimental and control groups are carefully set up. Any variables that might vitiate the result of the experiment are taken care of. Next, and independent variable is applied to one group and denied the other. Assuming a good control, it is possible to observe the effect of the independent variable on the dependent variable by comparing the experimental and the control groups. Such a study can establish a causal relation between two variables.

In the present case, the independent variable has occurred in an unknown amount. The function of the investigator is to start with the observation of the dependent variable. He next studies the independent variable retrospectively (usually using statistical models) for its possible relation to the dependent variable. In this study, the independent variables of food area, religion, education, and location are all events that have already occurred. This study is trying to explore what relation these have with the dependent variables of achievement motivation and school performance. The author is aware that this kind of design cannot establish a causal relationship because the investigated variables do not exhaust all possibilities. There might be a number of other variables, any one of which, of any combination

of which, may have caused the present state of academic achievement motivation in the students. Since this is so, the application of the regression model which establishes causality when used with natural experiments will not be so interpreted in this ex post facto design.

## The Sample

The subjects of this study consisted of 423 male students and 143 female students[1] drawn from the following schools in East Central State of Nigeria:

1. Dennis Memorial Grammar School, Onitsha
2. Awo-Ommama Education Project, Owerri
3. Awgu County Secondary School, Awgu
4. St. Teresa's College, Nsukka
5. Nigeria Secondary School, Nnewi
6. Maria Assumpta, Oguta
7. Our Lady's High School, Onitsha
8. Adventist High School, Ihie
9. Evangel High School, Umuahia

These nine schools were selected by randomization out of the original 264 secondary schools that existed in East Central State at the time of data gathering. About 800 boys and girls were considered a large

[1] These students took the M-Scales test. All of their responses were involved in calculating the reliability indices of both the male and female samples. When the WASC results were published, 370 male students and 112 female students received their results. The rest, mostly from the Nigerian Secondary School, Nnewi, were penalized for cheating in the WASC examinations. This meant that further analysis used the scores of only those students who had both the M-Scales scores and the WASC-S.

enough sample to afford representativeness if a careful selection plan was adopted. Considering current school enrollments and sectioning, this number worked out at about nine schools. It was then decided to select the schools randomly by drawing tickets from a basket. Altogether, 15 samples were drawn and each had 9 schools.

The principals of schools so selected were asked by letter to furnish the following details about their students in form five: name of student, sex, ethnic group of both parents, home division of the student (this helped to show whether students belonged to group A or group B), and religion of the student.

After two months only five samples of nine schools each had complete responses from the principals. Further efforts to recover more forms did not meet with success. All five samples of schools were subjected to analysis to determine if any one of them could be used for the study. Three were so lopsided that they did not merit further consideration. That is, the distribution of student characteristics in these three samples was too biased to permit their use. For example, one was overwhelmingly urban in nature, and another was overwhelmingly Protestant. Of the two surviving samples, one was discarded on the ground that Catholic girls were too few in it and group B was disproportionately larger than group A. The accepted sample of nine schools had the characteristics recorded in Table 3.1a.

This procedure of selection was adopted for a number of reasons:

1. Earlier missionary influence had brought about scattering of students. Missionary education supervisors

Table 3.1a.--Characteristics of the total accepted sample.[a] N = 790

| | Catholics | Protestants | Total | Group A | Group B |
|---|---|---|---|---|---|
| Boys | 282 (35.70)[b] | 283 (35.82) | 565 ( 71.52) | 235 (71.52) | 330 (41.77) |
| Girls | 110 (13.92) | 115 (14.56) | 225 ( 28.48) | 102 (12.91) | 123 (15.57) |
| Total | 392 (49.62) | 398 (50.38) | 790 (100.00) | 337 (42.66) | 453 (57.34) |

[a]Students without the relevant information on affiliation (for example, no religion stated) were not treated in the various analyses.

[b]Numbers in parentheses are percentages.

assigned students to schools irrespective of homes of origin.[2]

2. The state take-over of schools from the missions and private proprietors caused further dispersion of students. Denominational schools were no longer in existence and many single-sex schools became coeducational institutions. Boys and girls were admitted to schools irrespective of the former status of those schools.

3. The belief that since these events had taken place the randomly selected schools would hold enough students from both groups A and B, and would satisfy other variables under consideration.

After examining the accepted sample and its characteristics, the principals of the nine schools involved were contacted by mail and informed of the intention of testing the students on specified dates. Owing to absence and unwillingness to take the test on the part of some students--they were in the revision period at the time--the number that emerged is as shown in Tables 3.1b and 3.1c.[3] At this point, it might be

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[2]Two forces shaped the pattern of secondary school attendance in East Central State. The first of these was distance. Schools were far apart and students were drawn from distant areas. This necessitated the erection of dormitories to cater to them. The second was religious in character. Missionaries wanted close supervision of their adherents, hence they did not permit day students in schools run by them. This was especially so with the Catholics.

[3]In Table 3.1a and Table 3.1b, percentages are calculated on 790 and 566, respectively. But Table 3.1c records the percentages of obtained numbers over projected.

Table 3.1b.--Characteristics of participants in the M-Scales test.[a] N = 566

| | Catholics | Protestants | 1 No Information[c] | Total | Group A | Group B | 2 No Information[d] | EP | UP | 3 No Information[e] |
|---|---|---|---|---|---|---|---|---|---|---|
| Boys | 205 (36.22)[b] | 204 (36.04) | 14 (2.47) | 423 ( 74.73) | 183 (32.33) | 237 (41.87) | 3 (0.53) | 87 (15.37) | 332 (58.66) | 4 (0.71) |
| Girls | 63 (11.13) | 79 (12.19) | 1 (0.18) | 143 ( 25.27) | 59 (10.42) | 84 (14.84) | 0 (0.00) | 47 ( 8.30) | 95 (16.78) | 1 (0.18) |
| Total | 286 (47.35) | 283 (48.23) | 15 (2.65) | 566 (100.00) | 242 (42.75) | 321 (56.71) | 3 (0.53) | 134 (23.67) | 427 (75.44) | 5 (0.89) |

[a]Students without the relevant information on affiliation (for example, no religion stated) were not treated in the various analyses.

[b]Numbers in parentheses are percentages.

[c]No Information 1 above indicates numbers and percentages of those who did not give religious affiliation.

[d]No Information 2 above indicates numbers and percentages of those who did not show any group membership.

[e]No Information 3 above indicates numbers and percentages of those who did not give parental education.

pertinent to point out that the investigator could not have undertaken the data-gathering exercise any earlier than he did because of financial limitations.[4]

Table 3.1c.--Percentage of total sample who were used in the analysis. (in round figures)

| | Catholics | Protestants | Total | Group A | Group B |
|---|---|---|---|---|---|
| Boys | 73 | 72 | 75 | 78 | 72 |
| Girls | 57 | 69 | 64 | 59 | 68 |
| Total | 68 | 71 | 72 | 72 | 71 |

During the testing period, the students supplied information regarding the educational status of their parents.[5] This information enabled a decision to be made about parental education. The students also supplied information regarding the proposed variable of separation from family. From their responses the decision was made to drop this variable. The information regarding parental education was supplied by the students after they had taken the test; it was not made available

[4]The Nigerian civil war disrupted the normal living of people in East Central State. This study was initially undertaken without any sponsorship. It was not possible to gather enough personal money in time for the exercise; and when something reasonable was at hand, it was late in the year. Sample attrition might have been reduced if testing had been done earlier.

[5]In the context of this study, a family of father and mother was regarded as educated if one of the two had formal education up to West African School Certificate. Those families without this background were regarded as uneducated.

by the principals. This explains the absence of the information in Table 3.1a.

Study of Tables 3.1a and 3.1b reveals that there is little difference in the characteristics of sex, religion, and membership in group A or B between the accepted sample and those for whom actual M-Scales scores were obtained.

Reference to Table 3.1c shows the percentage of the projected or accepted numbers that was actually obtained. In terms of total numbers, 72 percent (566 over 790 multiplied by 100) was actually obtained. When broken down into its component parts, a total of 68 percent Catholics, 71 percent Protestants, 72 percent group A, and 71 percent group B were obtained for the analyses. If these totals are further broken down into boys and girls percentages the percentage results are as recorded in the rows represented by boys and girls on Table 3.1c.

Further examination shows that attrition was greater for the girls than for the boys. Attrition was due to three factors, namely: absence from school, unwillingness to participate in the testing, and disqualification as a result of cheating on the WASC examination.

Of the three causes of attrition, the most disturbing is the cheating question, in that it might conceivably have affected the entire result. Those who were not caught might have escaped with unrepresentative WASC results, not in keeping with their true performance. If this were the situation, then the validity figures obtained when the M-Scales scores were correlated with WASC-S would be defective.

One other characteristic of the sample that needs mention is the age range. Ages of the subjects range from 16 to 26 years. This

phenomenon was caused by the war, which set most of the students back three years or more. For many of the subjects, this is the age at which they are expected to be in the universities; previous studies have concluded that the M-Scales are not effective in predicting academic performance for this age group. If the scale is found to discriminate between the samples, it would furnish some evidence that the scales are valid for older students.

## Nature of the Data

Two main types of data were gathered on each student: (1) the aggregate scores from the West African School Certificate examinations (WASC-S), and (2) the M-Scales total and sub-test scores as well as necessary background information.

### The WASC-S

The aggregate scores were collected from the records of the "Awards Committee" of the West African Examinations Council for the year 1971. The "Awards Committee" decides what mark constitutes failure in each subject. Anyone who gets this failing mark or below receives a code of 9 in that subject. The rest of the marks, above the failing cutoff point, are reclassified and given codes ranging from 1 to 8. A code of 1 means excellent in a particular subject; a code of 2 means very good; and 3 means good. Four, 5, and 6 mean credit in a particular subject, while 7 and 8 indicate only a pass in the subject. When these codes are summed up in a candidate's best six subjects, he gets an aggregate score that determines his grade of pass in the whole examination. Thus, a candidate may get one of the following results:

a. aggregate 6 - 12 = grade 1 with distinction

b. aggregate 13 - 23 = grade 1

c. aggregate 24 - 33 = grade 2

d. aggregate 34 - 44 = grade 3

e. aggregate 45 - 48 = grade GCE (Appendix C shows a sample of results from one school

f. aggregate 49 - 54 = Fail

In most Nigerian schools, there are no GPA's, aptitude, or IQ measures of any kind for the students. The West African School Certificate Examination is about the only examination that is carefully set, marked, and recorded. Assuming freedom from cheating on the part of the students, the WASC-S is the best available measure of school achievement.

The M-Scales Scores

Students' responses to the M-Scales were obtained. The scales yielded four sub-scores and a total score. The four sub-scales are: (a) the Generalized Situational Choice Inventory, (b) the Preferred Job Characteristic Scale, (c) the Word Rating List, and (d) the Human Trait Inventory.

A high score on the GSCI indicates an individual with a high need for academic achievement. The PJCS examines academic motivation through occupational aspiration. The WRL is a measure of self-image in relation to academic matters. The HTI examines personality characteristics that make for low, high, or discrepant academic achievement. The total score is the overall index of an individual's academic achievement motivation.

## Analysis Procedures

The following procedures explained hereunder were utilized in the analysis of data: (1) correlational analysis, (2) test of significance of difference between means, (3) multiple regression analysis, (4) factor analysis, and (5) reliability estimates.

### Correlation Analysis

A matrix of intercorrelations of the WASC-S, M-Scales total scores, GSCI, PJCS, WRL, and HTI was calculated using the CORR25 Program of the Computer Center of the University of Ibadan. The results are as shown in Table 3.2 for males and females. See Appendix B1, Table B1.1 for further details on intercorrelations.

Table 3.2.--The matrix of correlation coefficients for males and females.[a]

| | | WASC-S | GSCI | PJCS | WRL | HTI | M-TOT |
|---|---|---|---|---|---|---|---|
| | | | | Males | | | |
| WASC-S | | ... | -0.26 | -0.24 | -0.24 | -0.18 | -0.30 |
| GSCI | | -0.29 | ... | 0.52 | -0.37 | 0.26 | 0.63 |
| PJCS | Females | -0.31 | 0.43 | ... | 0.37 | 0.23 | 0.61 |
| WRL | | -0.33 | 0.20 | 0.28 | ... | 0.46 | 0.90 |
| HTI | | -0.31 | 0.25 | 0.22 | 0.23 | ... | 0.64 |
| M-TOT | | -0.45 | 0.54 | 0.75 | 0.77 | 0.54 | ... |

[a]Entries above the diagonal are for males and below are for females. The negative coefficients are so because of the nature of correlated data. The higher the M-Scales scores the better the results, while the higher the WASC aggregate scores the poorer the candidates' results.

Test of Significance of
Difference Between Group Means

The t-test was used to test the significance of the observed differences between mean responses of two Ibo groups to the M-Scales. Tests were conducted between groups A and B, Catholics and Protestants, students of educated and uneducated parents, and students in schools located in urban and rural areas. The results are as shown in Tables 4.1 through 4.7.

Multiple Regression Analysis

Regression was used to predict WASC-S initially from the M-Scales total scores. The regression analysis yielded $R^2$, which is an index representing the percentage of WASC-S accountable for by academic motivation.

Next, a stepwise regression was used to predict WASC-S from the M-Scales total scores and the characteristics of food area, education, religion, and location. This step was undertaken with a view of determine whether the addition of these characteristics improved prediction of the WASC-S, and which of these characteristics possessed a higher independent explanatory power.

The next logical step was a stepwise regression to predict WASC-S from the M-Scales components. It is to be observed at this point that the sub-tests are positively intercorrelated. This step became necessary to check on the power of each sub-test to predict the WASC-S, and also to see at which point further addition of any of the component tests became unnecessary.

Following from the above was another stepwise regression involving the four components and the four characteristic variables. This was done to ascertain the predictive value of each of the components and each of the characteristic variables.

The next step involved determining the effect each of the four characteristic variables had on motivation represented by the M-Scale total scores.

The final step involved using each of the four components as a function of each of the characteristic variables in order to ascertain degrees of relationship.

In order to accomplish the task, information relating to student identity, WASC-S, schools from where the students came, religion, food area, parents' education, location of schools, M-Scale total and components were coded and punched on cards. For the four characteristic variables "dummy"[6] codes were used. Finally, the multiple regression equations were solved using the regular IBM Program of the University of Ibadan Computing Center. The overall results are contained in Tables 4.10 through 4.26.

Factor Analysis

Two separate analyses of Ibos' responses to the 53 items of the GSCI males and the 45 items for females[7] were conducted. Points

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[6]Since food area, parents' education, religion, and location of schools are characteristics and not scores, it was decided for analysis purposes to make them dichotomous variables. In this regard group A received a code of 1 and B a code of 0; Protestant 1, Catholic 0; educated 1, uneducated 0; urban 1, rural 0.

[7]The GSCI, as well as all the other sub-tests, has two forms--male and female. The male form contains 53 items and the female form

of similarities and differences between the factorial structures of Ibos, Caucasians, and American Negroes were noted and recorded in Table 4.38. Factors and factor loadings are shown in Table 4.27 through Table 4.37.

The procedure adopted was as follows:

1. After building the response matrices (53 x 423) and (45 x 143) the intercorrelations among the items were obtained using the APLIB (LTT2245,L) program of Michigan State University Computer Center for both males and females. (Professor William W. Farquhar personally supervised this aspect of the analysis.)

2. The principal axis solution was employed to factorize the matrices.

3. The factors were rotated to simple structure by the quartimax method (counter checked by the varimax method) of factor rotation. Appendices E, F, and G show the details.

4. The factors were interpreted. Tables 4.27 through 4.38 contain the extracted factors.

Reliability Estimates

The present study assumed the equivalence of the American eleventh grader and the Nigerian fifth former. Yoloye[8] made this assumption and his results supported the validity of it.

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46 items. But because item 19 of the female form showed no variance it had to be deleted from the analysis, leaving only 45 items for females.

[8]Ayotunde Emmanuel Yoloye, "The Performance of Bilingual Nigerian Children on Verbal and Non-Verbal Tests of Intelligence" (unpublished Ph.D. thesis, Columbia University, 1965).

The complete picture of comparability will unfold later in this report. See, for instance, the reliability pattern of the students' responses to the battery, Table 3.3, which compared favorably with the figures reported in previous studies.

Table 3.3.--Hoyt's analysis of variance for estimating reliability of the M-Scales.[a]

| Sub-tests | GSCI | PJCS | WRL | HTI | M-TOT |
|---|---|---|---|---|---|
| Ibo Males | .929 | .868 | .937 | .742 | .961 |
| Ibo Females | .888 | .955 | .899 | .811 | .957 |

[a]See Cyril Hoyt, "Test Reliability Estimated by Analysis of Variance," Psychometrika, VI (1941), 153-60. The analyses are based on 203 items for males and 257 items for females. Appendix J shows the formula for the calculations.

## Assumptions and Limitations

The planning and executing of research in the behavioral science field involve some assumptions that affect results and interpretations. This is particularly so when factor analysis is involved.

Factor analysis has as one of its assumptions that commonality of processes is attained when scores are correlated. But it is known that factors found may be due to anything which introduces correlation between variables, and this may be a common level of difficulty in items rather than a fundamental process of some kind.

Helen Peak has outlined some of the limitations involved in interpreting the results of factorial studies. One limitation, she points out, is the free hand the investigator has in deciding, for

instance, whether to regard the factors correlated as Thurstone would or uncorrelated as Spearman would. In other words, the problem is one of subjectivity that enters into rotation considerations. What factors emerge would seem to be a function of the hypotheses which guide the investigation. Also, the nature of the sample employed in the investigation (sex, education, social and cultural background, and intelligence) may introduce identifiable factors that may not be in keeping with "reality" as sought. These are sources of error variance which factor analysis, per se, is not capable of isolating. Finally, Peak observed that the naming and interpreting of emergent factors are based purely on personal knowledge and considerations of the investigator--considerations independent of the procedures of factor analysis.[9]

The assumptions and limitations involved with employing the M-Scales in research have been dealt with by Farquhar.[10] The assumptions are those of regarding under- and over-achievers as motivational extremes and those implicit in the reduction of theory into instrument through item construction, with the obvious limitations of some sort of personal bias that can affect results.

In spite of all these limitations, Kerlinger[11] expresses optimism. For him, all scientific constructs, like factors, are averages

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[9]Helen Peak, "Problems of Objective Observation," in Research Methods in the Behavioral Sciences, ed. by Leon Festinger and Daniel Katz (New York: Holt, Rinehart and Winston, 1953), p. 278.

[10]William W. Farquhar, "Motivational Factors Related to Academic Achievement," pp. 10-17.

[11]Kerlinger, op. cit., p. 684.

and are equally inventions of the scientist and can attain the status of "reality" if we can successfully predict relations from theoretical presuppositions and hypotheses.

Peculiar assumptions of this research, apart from those already mentioned, are:

1. The fifth formers and American eleventh graders are comparable.
2. The M-Scales as applied to the Ibo fifth formers are valid and reliable.
3. Catholic-Protestant behavior differences in the East Central State of Nigeria are similar to behavior differences between Catholics and Protestants in Europe and America.
4. WASC-S is a measure of academic performance.
5. No sample bias is introduced by sample attrition. (Examination of Tables 3.1a and 3.1b supports this. There was little difference in the characteristics of sex, religion, and membership in group A or B between projected and obtained samples.

Specific Limitations of the Study

The major limitation of this study concerns its ex post facto nature which makes it impossible to make categorical statements regarding causation. The design allows the use of a model, like the regression, which is used frequently to find a relation between two or more variables that are related causally, but yet imposes a heavy limitation in interpretation of results according to the assumptions of the model.

There is the limitation of the unproved nature of the M-Scales in the Nigerian context, although (as explained in Chapter I) the assumption of M-Scales validity for this population will be supported by a finding of differences between the research groups. Only in the case of a no-difference result will this become a problem.

## Summary

A sample made up of male and female students from nine secondary schools in East Central State of Nigeria was drawn. Altogether, 566 students took the motivational test. Further analysis involving the WASC-S used only 482 students made up of 370 males and 112 females. (Eighty-four students were penalized for cheating during the WASC examination.)

In order to achieve the objectives of the study, the following statistical techniques were undertaken:

a. Correlational analysis. This analysis was done in order to get a simple measure of the degree of covariability between the variables considered two at a time.

b. Multiple regression analysis. The regression model, especially its stepwise variant, was adopted in order to determine the percentage contribution of the independent variables in predicting the WASC-S.

c. Significant analysis. This was a measure of statistical significance of the differences between group means.

d. Factor analysis. This was undertaken to try to determine the underlying characteristics (factors or traits) involved in the

motivations of the fifth formers and to compare them with American students. Such factors would, in future, lead to hypotheses generation for further investigation.

# CHAPTER IV

## PRESENTATION OF RESULTS

This chapter deals with the results of the study. It presents the statistical analyses used for testing the research hypotheses. It deals specifically with the results of:

1. the *t*-tests of significance of the mean difference for males and females on the M-Scale total and sub-test scores, and the WASC-S between groups A and B Ibo fifth formers, Catholics and Protestants, students of educated and uneducated parents, and between urban and rural male students;[1]

2. the correlational and multiple regression analyses to try to understand the strength and direction of the relationship between the motivational scores and the achievement scores, and the effects of controlling the relationship for variation in four key background characteristics; and

3. the factor analysis of the responses of the Ibo males and females to the Generalized Situational Choice Inventory.

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[1]There were not enough female urban students (only five) for the comparison.

## Differences Between Group A and Group B Ibo Fifth Formers Mean Scores[2]

The null hypotheses tested for groups A and B fifth formers, males and females were:

$Ho_1$ There is no significant difference in mean scores on the total M-Scales between group A and group B fifth formers for either males or females.

$Ho_2$ There is no significant difference in mean scores on the four sub-tests of the M-Scales between group A and group B fifth formers for either males or females.

$Ho_3$ There is no significant difference in mean aggregate scores in West African School Certificate examination (WASC-S) between group A and group B fifth formers for either males or females.

As can be seen from Tables 4.1 and 4.2, the results obtained from testing the above hypotheses were as follows:

1. The M-Scales total score mean differences for both males and females were not significant at the .05 level, with $t$ of 0.77 and 0.62 for males and females, respectively. It was thus not possible to reject the hypothesis with the requisite security from error; the data are consistent with the hypothesis that there is no difference in achievement motivation between Ibo heartlanders and fringers.

2. The sub-tests registered the following $t$ ratios for males and females: GSCI (0.20 and 0.30), PJCS (1.06 and 0.72), WRL (0.96 and

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[2]Tables 4.1 and 4.2 present the means, standard deviations, and $t$-indices for groups A and B fifth form males and females.

Table 4.1.--t-tests of the means between group A and group B Ibo male students. N = 420

| Variable | Means | | Standard Deviations | | Frequencies | | t-Index | Significance |
|---|---|---|---|---|---|---|---|---|
| | B | A | B | A | B | A | | |
| WASC-S[a] | 35.11 | 32.13 | 8.86 | 9.68 | 172.0 | 196.0 | 3.08** | 99% |
| GSCI | 40.71 | 40.80 | 4.36 | 4.65 | 183.0 | 237.0 | 0.20 | ns[b] |
| PJCS | 22.32 | 22.73 | 3.97 | 3.75 | 182.0 | 237.0 | .06 | ns |
| WRL | 53.84 | 54.99 | 12.50 | 11.63 | 183.0 | 237.0 | 0.96 | ns |
| HTI | 30.32 | 30.05 | 5.06 | 4.41 | 183.0 | 237.0 | 0.58 | ns |
| M-TOT | 147.08 | 148.56 | 19.90 | 18.85 | 183.0 | 237.0 | 0.77 | ns |

**Statistically significant, P < .01.

[a] N.B. Low values indicate high academic performance and high values the converse.

[b] ns = not statistically significant.

Table 4.2.--*t*-tests of the means between group A and group B Ibo female students. N = 143

| Variable | Means | | Standard Deviations | | Frequencies | | *t*-Index | Significance |
|---|---|---|---|---|---|---|---|---|
| | B | A | B | A | B | A | | |
| WASC-S | 36.98 | 37.02 | 8.01 | 6.59 | 50.0 | 62.0 | 0.03 | ns |
| GSCI | 34.46 | 34.64 | 3.84 | 3.28 | 59.0 | 84.0 | 0.30 | ns |
| PJCS | 47.75 | 48.89 | 9.86 | 8.62 | 59.0 | 84.0 | 0.72 | ns |
| WRL | 61.78 | 59.85 | 10.87 | 11.00 | 59.0 | 84.0 | 1.04 | ns |
| HTI | 39.58 | 38.25 | 5.30 | 5.31 | 59.0 | 84.0 | 1.47 | ns |
| M-TOT | 183.56 | 181.39 | 21.44 | 19.04 | 59.0 | 84.0 | 0.62 | ns |

1.04), and HTI (1.47 and 0.58). These figures are not significant at the .05 level. The data are, therefore, consistent with the hypothesis that there are no differences between groups A and B on the several components of motivation. Hence we see that the no difference result for the overall M-Scales is not masking significant differences between groups A and B on the various components.

3. The difference in WASC-S was significant for the males in favor of group A, with a *t* ratio of 3.08, but not significant for the females with a *t* of 0.03. For the females, therefore, the data are in consonance with the hypothesis that there are no academic performance differences between heartlanders and fringers; but boys from the heartland showed an academic achievement on the average three points or 10 percent higher than boys from the fringe areas.

## Differences Between Ibo Catholics and Protestants Mean Scores[3]

The null hypotheses tested were:

$Ho_4$ There is no significant difference in the means of the total M-Scale scores between Catholics and Protestants for either males or females.

$Ho_5$ There is no significant difference in the mean scores on the four sub-tests of the M-Scales between Catholics and Protestants for either males or females.

$Ho_6$ There is no significant difference in mean aggregate scores in West African School Certificate examination

[3]Tables 4.3 and 4.4 present mean scores, standard deviations, and *t* indices for Catholic and Protestant male and female samples.

Table 4.3.--t-tests of the means between Catholic and Protestant Ibo male students. N = 409

| Variable | Means | | Standard Deviations | | Frequencies | | t-Index | Significance |
|---|---|---|---|---|---|---|---|---|
| | Cath. | Prot. | Cath. | Prot. | Cath. | Prot. | | |
| WASC-S | 33.59 | 33.32 | 9.17 | 9.73 | 183.0 | 176.0 | 0.27 | ns |
| GSCI | 40.85 | 40.91 | 4.55 | 4.38 | 206.0 | 203.0 | 0.13 | ns |
| PJCS | 22.38 | 22.89 | 3.93 | 3.47 | 206.0 | 202.0 | 1.38 | ns |
| WRL | 54.11 | 55.26 | 12.46 | 11.37 | 206.0 | 203.0 | 0.98 | ns |
| HTI | 30.52 | 29.87 | 4.83 | 4.59 | 206.0 | 203.0 | 1.41 | ns |
| M-TOT | 147.82 | 148.83 | 19.71 | 18.39 | 206.0 | 203.0 | 0.55 | ns |

Table 4.4.--t-tests of the means between Catholic and Protestant Ibo female students. N = 142

| Variable | Means | | Standard Deviations | | Frequencies | | t-Index | Significance |
|---|---|---|---|---|---|---|---|---|
| | Cath. | Prot. | Cath. | Prot. | Cath. | Prot. | | |
| WASC-S | 35.14 | 39.13 | 6.89 | 7.11 | 58.0 | 53.0 | 3.00** | 99% |
| GSCI | 34.84 | 34.31 | 3.10 | 3.82 | 64.0 | 78.0 | 0.92 | ns |
| PJCS | 49.53 | 47.44 | 9.03 | 9.15 | 64.0 | 78.0 | 1.36 | ns |
| WRL | 62.95 | 58.50 | 9.73 | 11.40 | 64.0 | 78.0 | 2.51* | 95% |
| HTI | 39.92 | 37.81 | 4.72 | 5.63 | 64.0 | 78.0 | 2.43* | 95% |
| M-TOT | 187.01 | 177.99 | 18.39 | 20.30 | 64.0 | 78.0 | 2.78** | 99% |

*Statistically significant, $P < .05$.

**Statistically significant, $P < .01$.

(WASC-S) between Catholics and Protestants for either males or females.

The difference between the means in total M-Scales scores was not significant at the .05 level of confidence ($t$ = 0.55) for the males, but significant ($t$ = 2.78) for the females in favor of Catholics.

The sub-tests had the following $t$-test results for Catholic and Protestant males and females, respectively: GSCI (0.13 and 0.92), PJCS (1.38 and 1.36), WRL (0.98 and 2.51), and HTI (1.41 and 2.43). The only results significant at the .05 level were WRL and HTI for the females, both in favor of Catholic girls.

The WASC-S was not significant at the .05 level for the males but was significant ($P < .01$) in favor of Catholic girls, having recorded a $t$ index of 0.27 for males and 3.00 for the females.

Thus Catholic girls showed both higher motivation and higher achievement than their Protestant counterparts, but religious affiliation had no discernible effect on either motivational or achievement scores among boys in this sample.

### Differences Between Mean Scores of Students of Educated and Uneducated Parents

In appraising the academic motivation of students of educated and uneducated parents, the hypotheses tested were:

$Ho_7$ There is no significant difference in the means of the total M-Scale scores between students of educated and uneducated parents for either males or females.

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[4] Tables 4.5 and 4.6 contain the results.

Table 4.5.--t-tests of the means between male Ibo students of educated and uneducated Ibo parents. N = 419

| Variable | Means | | Standard Deviations | | Frequencies | | t-Index | Significance |
|---|---|---|---|---|---|---|---|---|
| | Educ. | Uneduc. | Educ. | Uneduc. | Educ. | Uneduc. | | |
| WASC-S | 30.48 | 34.28 | 10.41 | 8.99 | 73.0 | 292.0 | 2.87** | 99% |
| GSCI | 41.71 | 40.64 | 4.06 | 4.50 | 85.0 | 332.0 | 2.10* | 95% |
| PJCS | 23.22 | 22.40 | 3.05 | 4.00 | 85.0 | 331.0 | 2.06* | 95% |
| WRL | 55.62 | 54.46 | 11.26 | 11.95 | 85.0 | 332.0 | 0.84 | ns |
| HTI | 30.04 | 30.30 | 5.10 | 4.53 | 85.0 | 332.0 | 0.43 | ns |
| M-TOT | 150.59 | 147.73 | 18.23 | 19.11 | 85.0 | 332.0 | 1.28 | ns |

*Statistically significant, $P < .05$.

**Statistically significant, $P < .01$.

Table 4.6.--t-tests of the means between Ibo female students of educated and uneducated parents.
N = 142

| Variable | Means | | Standard Deviations | | Frequencies | | t-Index | Significance |
|---|---|---|---|---|---|---|---|---|
| | Educ. | Uneduc. | Educ. | Uneduc. | Educ. | Uneduc. | | |
| WASC-S | 38.30 | 36.52 | 7.40 | 7.15 | 30.0 | 82.0 | 1.13 | ns |
| GSCI | 35.19 | 34.26 | 2.96 | 3.73 | 47.0 | 96.0 | 1.62 | ns |
| PJCS | 49.02 | 48.13 | 7.57 | 9.84 | 47.0 | 96.0 | 0.60 | ns |
| WRL | 61.15 | 60.40 | 11.12 | 10.92 | 47.0 | 96.0 | 0.38 | ns |
| HTI | 38.24 | 39.07 | 5.31 | 5.34 | 47.0 | 96.0 | 0.89 | ns |
| M-TOT | 183.13 | 181.88 | 18.37 | 20.87 | 47.0 | 96.0 | 0.37 | ns |

$Ho_8$ There is no significant difference in the mean scores on the four sub-tests of the M-Scales between students of educated and uneducated parents for either males or females.

$Ho_9$ There is no significant difference in mean aggregate scores in West African School Certificate examination (WASC-S) between students of educated and uneducated parents for either males or females.

In the M-Scales total scores, the male students of educated parents had a mean score of 150.59 while the students of uneducated parents had a mean score of 147.73. The difference between the two was not statistically significant ($\underline{t}$ = 1.28). Similarly, the females from educated and uneducated families had mean results of 183.13 and 181.88, respectively. These gave a $\underline{t}$ index of 0.37 that was not statistically significant. Hence the data are consonant with the hypothesis that there are no motivational differences between students of educated and uneducated parents.

For the two groups, educated parents versus uneducated parents (males and females), the sub-tests gave results as follows: GSCI (2.10 and 1.62), PJCS (2.06 and 0.60), WRL (0.84 and 0.38), and HTI (0.43 and 0.89). The differences were significant for the males in GSCI and PJCS in favor of the students with educated parents; but the differences were not significant at the .05 level in the other sub-tests.

The above conclusion on the total score masked the influences of the two significant components for the educated over the uneducated for males, while for the females the sub-components are in agreement with the total index.

The WASC-S yielded 30.48 and 38.30 means for male and female students of educated parents, respectively, while the means for the uneducated were 34.28 and 36.52 for males and females, respectively. The t index (2.87) was statistically significant for males at the .01 confidence level in favor of boys with educated parents; while that of the females (1.13) was statistically not significant.

A close examination of the results as shown on Table 4.5 shows specifically that education of parents of male students has little effect upon motivation for academic achievement as measured by the study. The 95 percent confidence interval shown for GSCI and PJCS is not a very strict one, and the difference on the average is only about one point. On the other hand, the education of parents of male Ibo students appears to have quite a significant effect on the academic performance measure, the WASC-S. It is to be observed that the direction of the difference for males on the WASC-S is what might be expected. Sons of uneducated Ibo parents on the average scored nearly four points worse on the WASC-S than the sons of educated Ibo parents.

Parents' education makes a difference in performance for boys but not for girls. Whether or not a girl's parents are educated is of no count in her academic performance.

### Differences Between Male Urban and Rural Students' Mean Scores[5]

In order to investigate if either urban or rural location of schools had any relationship with students' academic achievement

[5]The results are shown in Table 4.7.

Table 4.7.--*t*-tests of the means between urban and rural Ibo male students. N = 370

| Variable | Means | | Standard Deviations | | Frequencies | | *t*-Index | Significance |
|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | Urban | Rural | Urban | Rural | | |
| WASC-S | 29.81 | 36.65 | 8.55 | 8.96 | 166.0 | 205.0 | 7.51** | 99% |
| GSCI | 40.00 | 41.00 | 3.81 | 4.90 | 167.0 | 256.0 | 1.31 | ns |
| PJCS | 22.62 | 22.52 | 3.67 | 3.94 | 167.0 | 255.0 | 0.25 | ns |
| WRL | 55.60 | 54.17 | 11.67 | 12.22 | 167.0 | 256.0 | 0.75 | ns |
| HTI | 30.77 | 29.77 | 4.07 | 5.02 | 167.0 | 256.0 | 2.27* | 95% |
| M-TOT | 148.83 | 147.39 | 17.23 | 20.51 | 167.0 | 256.0 | 0.78 | ns |

*Statistically significant, $P < .05$.

**Statistically significant, $P < .01$.

motivation and their academic performance, the following three hypotheses were tested:

$Ho_{10}$ There is no significant difference in mean scores on the total M-Scales between urban and rural male students.

$Ho_{11}$ There is no significant difference in mean scores on the four sub-tests of the M-Scales between male urban and rural students.

$Ho_{12}$ There is no significant difference in mean aggregate scores in West African School Certificate examination (WASC-S) between male urban and rural students.

The M-Scale total means yielded a t index of 0.78 which was not statistically significant at the .05 level. The data, therefore, are consistent with the hypothesis that there are no motivational differences between male urban and male rural students.

Again, the t-test results on the sub-components were as follows: GSCI (1.31), PJCS (0.25), WRL (0.75), and HTI (2.27). Only the HTI was statistically significant at the .05 level in favor or urban male students. Urban boys on the average enjoy academic performance advantage of nearly seven points over rural boys. Urban boys differ in performance but not in motivation.

Table 4.9 summarizes the way the six variables (GSCI, PJCS, WRL, HTI, M-TOTAL, and WASC-S) functioned in this study in relation to the variables of food area, religion, education of parents, and location of schools.

This study has now examined the various variables hypothesized as important. It is necessary now to examine whether boys do better than

girls on the WASC-S as independent groups. In order to conform to the null form pattern, the hypothesis tested was:

There is no significant difference between the mean score of boys and the mean score of girls in the WASC-S.

As Table 4.8 shows, the boys, as a group, had a mean score of 33.58 and the girls 37.00 in the WASC-S. The difference between the two means is statistically significant at the .01 level of confidence in favor of boys. We can very safely reject the hypothesis of no difference in academic achievement between Ibo males and females in our sample.

Table 4.8.--Gains in WASC-S by sex, means, standard deviations, and test of significance.

| Sex | Gains in WASC-S Performance | | | |
|---|---|---|---|---|
| | Mean | SD | N | t |
| Boys | 33.59 | 9.44 | 370 | 4.071** |
| Girls | 37.00 | 7.29 | 112 | |

**Statistically significant, $P < .01$.

## Multiple Regression Analysis

The second objective of this thesis was to study the predictive effects of the M-Scales total scores, the sub-tests, and the other independent variables of food area, religion, education of parents, and location of schools on the WASC-S. In order to accomplish this, the following hypotheses were tested:

$H_{13a}$ The M-Scale total scores, as proxy for overall academic achievement motivation, will predict academic performance better than chance.

$H_{13b}$ The M-Scale total scores will predict academic performance better than chance even after taking into account the simultaneous independent influences of other variables of food area, religion, education of parents, and location of schools.

$H_{13c}$ Each of the four independent variables of food area, religion, education of parents, and location of schools has a significant influence on performance even when academic achievement motivation is held constant.

$H_{13d}$ Insofar as M-Scale total scores predict academic performance, that predictive ability is due to certain of the M-Scales' sub-scales.

$H_{13e}$ The M-Scales' sub-scales, controlled for the simultaneous influence of other variables, will predict WASC-S significantly better than chance.

$H_{13f}$ Each of the four variables, after controlling for the simultaneous influence of M-Scales' sub-scores, has a significant effect on academic performance (WASC-S).

$H_{13g}$ Each of the four control variables has a significant effect upon the M-Scale total scores.

$H_{13h}$ Each of the four variables has an independent influence on the determination of each of the M-Scales sub-scale scores.

When the M-Scale total scores were regressed on the WASC-S, it was found that the M-Scale total scores predicted about 9 percent of

Table 4.9.--Pattern of hypotheses confirmation and rejection as shown by the means.

| | Food Area | | | | Religion | | | | Education | | | | Location | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Male | | Female | | Male | | Female | | Male | |
| GSCI | A:B | ns | A:B | ns | P:C | ns | P:C | ns | E>U | * | E:U | ns | U:R | ns |
| PJCS | A:B | ns | A:B | ns | P:C | ns | P:C | ns | E>U | * | E:U | ns | U:R | ns |
| WRL | A:B | ns | A:B | ns | P:C | ns | C>P | * | E:U | ns | E:U | ns | U:R | ns |
| HTI | A:B | ns | A:B | ns | P:C | ns | C>P | * | E:U | ns | E:U | ns | U R | * |
| M-TOT | A:B | ns | A:B | ns | P:C | ns | C>P | * | E:U | ns | E:U | ns | U:R | ns |
| WASC-S | A>B | * | A:B | ns | P:C | ns | C>P | * | E:U | ns | E:U | ns | U>R | * |

*Statistically significant at better than .05 level.

the variance of WASC-S for males and about 20 percent for females (see Table 4.10). These figures are statistically significant (F = 35.9 males, F = 27.9 females). Each point increase in M-Scale total scores (mean 147.8 males, 183.5 females) on the average produces .145 (male) and .163 (female) points decrease (betterment) on the WASC-S (mean 33.5 male, and 37.0 female). Both of these coefficients are statistically significant ($t$ = 5.99 male, and -5.29 female). In effect, one standard deviation increase on M-Scale total scores (SD = 19.2 male, and 20.0 female) produces .31 and .44 (male and female, respectively) standard deviations of WASC-S (SD = 9.4 male, and 7.3 female). The improvement that would accrue for both boys and girls is not overwhelmingly influential, but nonetheless to be reckoned with. These data are, therefore, consistent with the hypothesis that motivation will predict achievement better than chance.

Viewing this same question from another angle, that is, from the situation where the simultaneous independent influences of other variables are accounted for, we still find that this hypothesis is accepted. Reference to Tables 4.11 and 4.12 shows that for the males the M-Scale variance contribution in the prediction of WASC-S is 8 percent, while the other four variables contributed a total variance of 15.7 percent as follows: (1) location of schools, 13 percent; (2) parents' education, 1.4 percent; (3) food area, 0.9 percent; and (4) religion, 0.4 percent. An F value of 22.59 indicates that this 8 percent is a statistically significant contribution at better than .01 level.

Table 4.10.--Stepwise regression analysis: WASC-S as function of M-Scales total scores.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR MALES | | | | | | |
| 2924.02 | 2924.02 | 0.09 | 0.09 | 35.92 | 9.02 | M-Total | -0.15 | 0.02 | -5.99 | 55.16 | -0.31 | WASC-S |
| | | | | | | FOR FEMALES | | | | | | |
| 1196.06 | 1196.06 | 0.20 | 0.20 | 27.95 | 6.54 | M-Total | -0.16 | 0.03 | -5.29 | 67.03 | -0.44 | WASC-S |

N.B. Figures are corrected to two places of decimals.

Legend:
- SS = sum of squares reduced in the step
- CSS = cumulative sum of squares reduced
- PR = proportion reduced in the step
- CPR = cumulative proportion reduced
- SE-est = standard error of estimate
- Pred'g Var. = predicting variable (independent)
- RCo = regression coefficient
- SERCo = standard error of regression coefficient
- SRCo = standardized regression coefficient
- Pred'd Var. = predicted variable (dependent)

Table 4.11.--Stepwise regression analysis: WASC-S as function of M-Scales total scores and characteristics of food area, parents' education, religion, and location of schools for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR MALES | | | | | | |
| 2481.61 | 4281.61 | 0.13 | 0.13 | 55.10 | 8.82 | LS | -6.84 | 0.92 | -7.42 | 36.65 | -0.36 | WASC-S |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | LS | -6.60 | 0.88 | -7.50 | | | |
| 2623.21 | 6904.82 | 0.08 | 0.21 | 48.78 | 8.41 | M-Total | -0.14 | 0.02 | -6.09 | 57.00 | | WASC-S |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | LS | -6.44 | 0.88 | | | | |
| | | | | | | M-Total | -0.13 | 0.02 | | | | |
| 472.99 | 7377.81 | 0.01 | 0.22 | 35.30 | 8.35 | PE | -2.85 | 1.10 | -2.61 | 56.95 | -0.12 | WASC-S |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | LS | -6.23 | 0.88 | -7.09 | | | |
| | | | | | | M-Total | -0.13 | 0.02 | -5.95 | | | |
| | | | | | | PE | -2.56 | 1.10 | -2.33 | | | |
| 288.98 | 7666.78 | 0.01 | 0.23 | 27.75 | 8.31 | FA | -1.80 | 0.88 | -2.05 | 57.62 | | WASC-S |
| | | | | | | FOR VARIABLE FIVE ENTERED | | | | | | |
| | | | | | | LS | -6.47 | 0.90 | -7.21 | | | |
| | | | | | | M-Total | -0.13 | 0.02 | -5.89 | | | |
| | | | | | | PE | -2.34 | 1.11 | -2.11 | | | |
| | | | | | | FA | -1.73 | 0.88 | -1.96 | | | |
| 118.68 | 7785.45 | 0.00 | 0.24 | 22.59 | 8.30 | R | -1.17 | 0.90 | -1.31 | 58.00 | | WASC-S |

N.B. The symbols are the same for subsequent tables.

Legend: LS = location of school PE = parents' education R = religion FA = food area

Table 4.12.--Stepwise regression analysis: WASC-S as function of M-Scales total scores and characteristics of food area, parents' education, religion, and location of schools for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 1196.06 | 1196.06 | 0.20 | 0.20 | 27.95 | 6.54 | M-Total | -0.16 | 0.03 | -5.29 | 67.03 | | WASC-S |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | M-Total | -0.16 | 0.03 | -5.30 | | | |
| 205.17 | 1401.22 | 0.04 | 0.24 | 16.96 | 6.43 | LS | -6.56 | 2.94 | -2.23 | 66.87 | | WASC-S |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | M-Total | -0.15 | 0.03 | -4.81 | | | |
| | | | | | | LS | -5.51 | 2.98 | -1.85 | | | |
| 122.88 | 1524.10 | 0.02 | 0.26 | 12.53 | 6.37 | R | 2.20 | 1.27 | 1.74 | 63.52 | | WASC-S |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | M-Total | -0.15 | 0.03 | -4.89 | | | |
| | | | | | | LS | -5.08 | 2.99 | -1.70 | | | |
| | | | | | | R | 2.10 | 1.26 | 1.66 | | | |
| 59.71 | 1583.81 | 0.01 | 0.27 | 9.81 | 6.35 | PE | 1.67 | 1.37 | 1.22 | 63.60 | | WASC-S |
| | | | | | | FOR VARIABLE FIVE ENTERED | | | | | | |
| | | | | | | M-Total | -0.15 | 0.03 | -4.82 | | | |
| | | | | | | LS | -5.09 | 3.02 | -1.69 | | | |
| | | | | | | R | 2.11 | 1.30 | 1.62 | | | |
| | | | | | | PE | 1.66 | 1.40 | 1.19 | | | |
| 0.02 | 1583.83 | 0.00 | 0.27 | 7.77 | 6.38 | FA | 0.03 | 1.27 | 0.02 | 63.57 | | WASC-S |

The variance contribution by the M-Scale total scores for the females is much greater than that for the males. All the variables including the M-Scale total scores made an overall contribution of 26.9 percent distributed as follows: (1) M-Scale total scores, 20.3 percent; (2) location of school, 3.5 percent; (3) religion, 2.1 percent; (4) parents' education, 1.0 percent; and (5) food area, 0.0 percent. The M-Scale contribution is statistically significant ($F = 7.77$) at the .01 level. The fact that the cumulative effects of the influences of other variables reduced its coefficient does not in any way alter the conclusion. See particularly Table 4.12, rows one and five.

In an attempt to understand what contribution each variable of this study made to performance, we next decided to determine if the variables of food area, parents' education, religion, and location of schools had significant influences on WASC-S when academic achievement motivation was held constant.

For the males, the position is illustrated on Table 4.11. When motivation was held constant, two things happened: (a) Religion (0.4 percent) and food area (0.9 percent) made no significant contribution as the *t*-values of -1.31 and -1.95, respectively, on their coefficients indicate; (b) Location of schools and parents' education made statistically significant contributions at the confidence level of better than .01. However, parents' education contributed only 1.4 percent of WASC-S variance. This is not a major contribution, though it is statistically significant. Location of school is, therefore, the single most important predictor of WASC-S, accounting by itself for 13.0 percent of the variance of WASC-S, and for a 6.8 point advantage on WASC-S

accruing on the average to students from urban schools over those from rural schools.

For the females, details of analyses are contained in Table 4.12. As row five of this table demonstrates, three variables of food area, parents' education, and religion made no statistically significant gain in the prediction of performance. Location of school accounted for an approximate 4 percent variance of WASC-S which was also significant at better than .01 level of confidence. Controlling the relationship between WASC-S and M-Scale total scores for other characteristics shows motivation as still the single most important predictor (unlike the male sample where location of school was). But location of school is second in importance for females, with about 6.5 point WASC-S advantage accruing to urban over rural schools. What emerged out of the analyses was that for the males, the operative hypothesis was accepted for the location and parents' education variables and rejected for food area and religion variables. For the females, the hypothesis was rejected for all variables except location of school variable.

It has thus been established that the overall motivation for both males and females plays a vital role in determining academic performance. It is pertinent to know if the ability to predict is due to certain of the sub-components and not to others. For the males, all the four sub-components, acting simultaneously, predict a total of 10.2 percent variance in performance (see Table 4.13, row four). The relative contribution of each is as follows: (a) GSCI, 6.6 percent; (b) WRL, 2.3 percent; (c) PJCS, 1.0 percent; and (d) HTI, 0.3 percent. It is clear that for the males the contributions of the GSCI and WRL are

Table 4.13.--Stepwise regression analysis: WASC-S as function of M-Scales components for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'g Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 2174.46 | 2174.46 | 0.07 | 0.07 | 26.06 | 9.13 | GSCI | -0.58 | 0.11 | -5.11 | 57.25 | -0.26 | WASC-S |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | GSCI | -0.44 | 0.12 | -3.60 | | -0.19 | |
| 763.62 | 2938.08 | 0.02 | 0.09 | 18.01 | 9.03 | WRL | -0.13 | 0.04 | -3.06 | 58.34 | -0.17 | WASC-S |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | GSCI | -0.33 | 0.13 | -2.49 | | | |
| | | | | | | WRL | -0.11 | 0.04 | -2.61 | | | |
| 313.48 | 3251.56 | 0.01 | 0.10 | 13.39 | 8.99 | PJCS | -0.28 | 0.14 | -1.97 | 59.42 | | WASC-S |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | GSCI | -0.32 | 0.13 | -2.40 | | | |
| | | | | | | WRL | -0.09 | 0.05 | -1.96 | | | |
| | | | | | | PJCS | -0.28 | 0.14 | -1.94 | | | |
| 86.89 | 3338.45 | 0.00 | 0.10 | 10.31 | 8.99 | HTI | -0.12 | 0.11 | -1.04 | 61.39 | | WASC-S |

more important than the others. As the t-value column of Table 4.13 demonstrates, there is a gradual decrease in value of their coefficients as each of the remaining three variables is entered. This gradual decrease leaves the GSCI as the most significant variable. The GSCI's coefficient fell from -0.58 to -0.32 (yet significant, $t = -2.40$), that of the WRL fell from -0.13 to -0.09 (barely significant, $t = -1.955$) when the PJCS and the HTI entered the equation. Thus, from this information alone, one can infer that the PJCS and the HTI correlate highly with the GSCI and the WRL, respectively--a fact that can be demonstrated from the intercorrelation matrix, Appendix B1, Table B1.1. In this table, one can observe that the PJCS correlates about .49 with the GSCI and the HTI about .49 with the WRL. These high intercorrelations are responsible for the depressed coefficient and t-values as shown in the fourth row of Table 4.13 for males. In effect, it appears that not much will be lost if the GSCI and the WRL were retained and the PJCS and the HTI were eliminated for the male samples. The actual loss, in this case, is about one-ninth of the predictive value of the sub-scales in combination. Again, in terms of predictive effects, we do know that if motivation total index is increased by one standard deviation point we get 2.9 percent betterment in WASC-S, but if again motivation, as represented by the GSCI, were to be increased by one standard deviation point, the percentage betterment accruing in WASC-S would be about 2.5. This information shows that the GSCI is clearly the most important sub-scale predictor for the male sample, followed by the WRL. The HTI--and whatever dimension of motivation it captures--

has no relation to academic performance. The PJCS is only marginally related.

The relative contributions for the four sub-scales for the female sample are as follows: (a) WRL, 10.9 percent; (b) HTI, 5.3 percent; (c) GSCI, 3.3 percent; and (d) PJCS, 1.5 percent. As Table 4.14 demonstrates, it is clear that for the females the contributions of the WRL and HTI are more important than the rest. As we scan the regression coefficient and t-value columns of Table 4.14, we observe the same pattern of the tapering off of the values as in the case of the boys. Thus the WRL turned out to be the most significant variable ($t$ = -2.33) followed by the HTI ($t$ = -1.916). An examination of row three of Table 4.14 shows that at that point, the WRL, the HTI, and the GSCI are significant as exemplified by their $t$ indices. This significance was lost with the entry of the PJCS in the last row of the same table. The reduction effect thus observed is not surprising when it is observed from Appendix B1, Table B1.1 that the PJCS correlates with the GSCI .39, with the HTI .28, and with the WRL .30. For the females, the elimination of the PJCS would not seem to have an adverse effect on the battery as an academic achievement motivation measure. Having thus observed, we can safely conclude that of M-Scale subcomponents, the WRL is the most important determinant of WASC-S, followed by the HTI, and then by the GSCI. The PJCS is not significant.

In sum, one can agree with the hypothesis that the predictive value of the M-Scales rests more on some sub-scales than on others. In this case, it is the GSCI and WRL for males and the WRL, HTI, and

Table 4.14.--Stepwise regression analysis: WASC-S as function of M-Scales components for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 645.29 | 645.29 | 0.11 | 0.11 | 13.50 | 6.91 | WRL | -0.21 | 0.06 | -3.67 | 49.74 | | WASC-S |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | WRL | -0.17 | 0.06 | -2.94 | | | |
| 314.58 | 959.87 | 0.05 | 0.16 | 10.58 | 6.74 | HTI | -0.36 | 0.14 | -2.63 | 61.60 | | WASC-S |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | WRL | -0.15 | 0.06 | -2.67 | | | |
| | | | | | | HTI | -0.30 | 0.14 | -2.16 | | | |
| 197.24 | 1157.11 | 0.03 | 0.20 | 8.78 | 6.63 | GSCI | -0.39 | 0.18 | -2.12 | 71.59 | | WASC-S |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | WRL | -0.14 | 0.06 | -2.33 | | | |
| | | | | | | HTI | -0.27 | 0.14 | -1.92 | | | |
| | | | | | | GSCI | -0.30 | 0.19 | -1.55 | | | |
| 88.31 | 1245.41 | 0.02 | 0.21 | 7.15 | 6.60 | PJCS | -0.12 | 0.08 | -1.42 | 71.84 | | WASC-S |

GSCI for the females. There is then a difference in order of importance of the sub-scales for both samples.

Turning to the hypothesis that the M-Scales' sub-scales controlled for the simultaneous influence of other variables will predict WASC-S significantly better than chance, we observe in Table 4.15 that all the four sub-scales and the four characteristic variables together contribute 25.5 percent variance in predicting the WASC-S for males. The relative contribution of all four sub-scales was: (a) GSCI, 7.8 percent; (b) WRL, 1.6 percent; (c) PJCS, 0.5 percent; and (d) HTI, 0.1 percent (see Table 4.15). The four characteristic variables also contributed as follows: (a) location of school, 13.0 percent; (b) parents' education, 1.2 percent; (c) food area, 0.9 percent; and (d) religion, 0.4 percent. It is clear that two variables stand out more prominently than the rest, namely: the GSCI and the location variable. From row eight of Table 4.15 one can observe that after all the other variables had been controlled the GSCI alone possessed enough staying power to withstand the gradual eliminating effects which the simultaneous inclusion of other variables brought about. The hypothesis is true of the GSCI males and not of the other sub-scales. In total, the model predicts 25.5 percent of variance of WASC-S. Of this gross, the location variable predicts 13.0 percent and the food area variable predicts 0.9 percent, which is still significantly different from zero with about 95.1 percent security.

For the females, Table 4.16, the relative contribution of each sub-scale is as follows: (a) WRL, 10.9 percent; (b) HTI, 5.3 percent; (c) GSCI, 2.8 percent; and (d) PJCS, 0.9 percent. Row four of Table 4.16

Table 4.15.--Stepwise regression analysis: WASC-S as function of M-Scales components and characteristics of food area, parents' education, religion, and location of schools for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 4281.61 | 4281.61 | 0.13 | 0.13 | 55.10 | 8.82 | LS | -6.84 | 0.92 | -7.42 | 36.65 | -0.36 | WASC-S |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | LS | -7.16 | 0.88 | -8.12 | | | |
| 2571.07 | 6852.68 | 0.08 | 0.21 | 48.32 | 8.42 | GSCI | -0.63 | 0.11 | -6.02 | 62.58 | -0.29 | WASC-S |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | LS | -6.99 | 0.88 | -7.97 | | | |
| | | | | | | GSCI | -0.51 | 0.11 | -4.55 | | | |
| 514.19 | 7366.87 | 0.02 | 0.22 | 35.23 | 8.35 | WRL | -0.10 | 0.04 | -2.72 | 63.34 | | WASC-S |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | LS | -6.83 | 0.87 | -7.82 | | | |
| | | | | | | GSCI | -0.49 | 0.11 | -4.37 | | | |
| | | | | | | WRL | -0.10 | 0.04 | -2.70 | | | |
| 399.10 | 7765.93 | 0.01 | 0.24 | 28.22 | 8.30 | PE | -2.63 | 1.09 | -2.41 | 62.83 | | WASC-S |
| | | | | | | FOR VARIABLE FIVE ENTERED | | | | | | |
| | | | | | | LS | -6.61 | 0.88 | -7.55 | | | |
| | | | | | | GSCI | -0.49 | 0.11 | -4.39 | | | |
| | | | | | | WRL | -0.10 | 0.04 | -2.66 | | | |
| | | | | | | PE | -2.34 | 1.10 | -2.13 | | | |
| 283.89 | 8049.86 | 0.01 | 0.25 | 23.60 | 8.26 | FA | -1.79 | 0.88 | -2.04 | 63.51 | -0.09 | WASC-S |
| | | | | | | FOR VARIABLE SIX ENTERED | | | | | | |
| | | | | | | LS | -6.55 | 0.88 | -7.48 | | | |
| | | | | | | GSCI | -0.41 | 0.12 | -3.38 | | | |
| | | | | | | WRL | -0.09 | 0.04 | -2.31 | | | |
| | | | | | | PE | -2.25 | 1.10 | -2.06 | | | |
| | | | | | | FA | -1.77 | 0.87 | -2.02 | | | |
| 166.51 | 8216.37 | 0.01 | 0.25 | 20.16 | 8.24 | PJCS | -0.21 | 0.13 | -1.57 | 64.26 | | WASC-S |
| | | | | | | FOR VARIABLE SEVEN ENTERED | | | | | | |
| | | | | | | LS | -6.82 | 0.90 | -7.61 | | | |
| | | | | | | GSCI | -0.43 | 0.12 | -3.48 | | | |
| | | | | | | WRL | -0.09 | 0.04 | -2.19 | | | |
| | | | | | | PE | -2.02 | 1.11 | -1.83 | | | |
| | | | | | | FA | -1.69 | 0.87 | -1.93 | | | |
| | | | | | | PJCS | -0.19 | 0.13 | -1.47 | | | |
| 134.00 | 8350.37 | 0.00 | 0.25 | 17.61 | 8.23 | R | -1.25 | 0.89 | -1.41 | 64.95 | | WASC-S |
| | | | | | | FOR VARIABLE EIGHT ENTERED | | | | | | |
| | | | | | | LS | -6.77 | 0.90 | -7.51 | | | |
| | | | | | | GSCI | -0.42 | 0.12 | -3.41 | | | |
| | | | | | | WRL | -0.07 | 0.04 | -1.72 | | | |
| | | | | | | PE | -2.06 | 1.11 | -1.86 | | | |
| | | | | | | FA | -1.71 | 0.88 | -1.95 | | | |
| | | | | | | PJCS | -0.19 | 0.13 | -1.45 | | | |
| | | | | | | R | -1.31 | 0.90 | -1.46 | | | |
| 28.74 | 8379.11 | 0.00 | 0.26 | 15.43 | 8.24 | HTI | -0.07 | 0.11 | -0.65 | 66.09 | | WASC-S |

Table 4.16.--Stepwise regression analysis: WASC-S as function of M-Scales components and characteristics of food area, parents' education, religion, and location of schools for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCO | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 645.29 | 645.29 | 0.11 | 0.11 | 13.50 | 6.91 | WRL | -0.21 | 0.06 | -3.67 | 49.74 | -0.25 | WASC-S |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | WRL | -0.17 | 0.06 | -2.94 | | | |
| 314.58 | 959.87 | 0.05 | 0.16 | 10.58 | 6.74 | HTI | -0.36 | 0.14 | -2.63 | 61.60 | -0.18 | WASC-S |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | WRL | -0.16 | 0.06 | -2.86 | | | |
| | | | | | | HTI | -0.41 | 0.14 | -3.06 | | | |
| 311.40 | 1271.27 | 0.05 | 0.22 | 9.88 | 6.55 | LS | -8.16 | 3.03 | -2.69 | 63.43 | | WASC-S |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | WRL | -0.15 | 0.06 | -2.61 | | | |
| | | | | | | HTI | -0.35 | 0.14 | -2.58 | | | |
| | | | | | | LS | -7.71 | 2.99 | -2.57 | | | |
| 162.54 | 1433.81 | 0.03 | 0.24 | 8.58 | 6.46 | GSCI | -0.35 | 0.18 | -1.97 | 72.43 | | WASC-S |
| | | | | | | FOR VARIABLE FIVE ENTERED | | | | | | |
| | | | | | | WRL | -0.12 | 0.06 | -2.12 | | | |
| | | | | | | HTI | -0.33 | 0.14 | -2.44 | | | |
| | | | | | | LS | -6.50 | 3.04 | -2.14 | | | |
| | | | | | | GSCI | -0.37 | 0.18 | -2.10 | | | |
| 137.09 | 1570.90 | 0.02 | 0.27 | 7.69 | 6.39 | R | 2.36 | 1.29 | 1.83 | 69.53 | | WASC-S |
| | | | | | | FOR VARIABLE SIX ENTERED | | | | | | |
| | | | | | | WRL | -0.11 | 0.06 | -1.86 | | | |
| | | | | | | HTI | -0.30 | 0.14 | -2.21 | | | |
| | | | | | | LS | -6.10 | 3.05 | -2.00 | | | |
| | | | | | | GSCI | -0.30 | 0.19 | -1.62 | | | |
| | | | | | | R | 2.33 | 1.29 | 1.82 | | | |
| 53.25 | 1624.14 | 0.01 | 0.28 | 6.64 | 6.38 | PJCS | -0.09 | 0.08 | -1.14 | 69.70 | | WASC-S |
| | | | | | | FOR VARIABLE SEVEN ENTERED | | | | | | |
| | | | | | | WRL | -0.11 | 0.06 | -1.90 | | | |
| | | | | | | HTI | -0.29 | 0.14 | -2.07 | | | |
| | | | | | | LS | -5.59 | 3.08 | -1.81 | | | |
| | | | | | | GSCI | -0.32 | 0.19 | -1.72 | | | |
| | | | | | | R | 2.26 | 1.28 | 1.76 | | | |
| | | | | | | PJCS | -0.10 | 0.08 | -1.24 | | | |
| 53.30 | 1677.44 | 0.01 | 0.28 | 5.90 | 6.38 | PE | 1.60 | 1.39 | 1.15 | 69.70 | | WASC-S |
| | | | | | | FOR VARIABLE EIGHT ENTERED | | | | | | |
| | | | | | | WRL | -0.11 | 0.06 | -1.88 | | | |
| | | | | | | HTI | -0.29 | 0.14 | -2.03 | | | |
| | | | | | | LS | -5.58 | 3.10 | -1.80 | | | |
| | | | | | | GSCI | -0.32 | 0.19 | -1.70 | | | |
| | | | | | | R | 2.24 | 1.33 | 1.69 | | | |
| | | | | | | PJCS | -0.10 | 0.08 | -1.22 | | | |
| | | | | | | PE | 1.61 | 1.42 | 1.14 | | | |
| 0.18 | 1677.62 | 0.00 | 0.28 | 5.11 | 6.41 | FA | -0.09 | 1.31 | -0.07 | 69.82 | | WASC-S |

shows that WRL, HTI, location of school, and GSCI together predict 24.3 percent for all the variables taken together. From row five onwards, there is a gradual reduction in coefficient effect due to the inclusions of religion, PJCS, parents' education, and food area variables. Their simultaneous inclusion left the coefficient of the HTI as the only significant one.[6] The changes in regression effects notwithstanding, the conclusion is that our operative hypothesis is true of the WRL and the HTI.

It is also necessary to determine what effect each of the four variables hypothesized as important in this study had on academic performance. (Refer to Tables 4.15 and 4.16, row eight of both.) After controlling for the simultaneous influences of the four sub-scales, two characteristic variables stand out as making significant contributions for the male sample. They are the location and food area variables. These variables contributed 13.0 percent and 0.9 percent, respectively. When all the other three characteristic variables and the four sub-scales were entered in the equation (Table 4.15, row eight), it became clear that the location variable was highly significant with 6.8 point advantage on WASC-S accruing on the average to students from urban schools over those from rural schools, even after holding all other variables constant. Food area had a 1.7 point advantage accruing to students from the heartland over those of the fringe. This contribution, as noted earlier, has 95 percent security, and thus constitutes

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[6]The higher regression coefficient of the HTI in the final row of Table 4.16 is surprising. The reason may be that many of the items of the WRL can be subsumed under the HTI; but this is not borne out by the correlation coefficient .27 between the two.

some weak congruent evidence for the subsistence economy hypothesis.

For the female sample, none of the selected variables has any significant effect on academic performance as measured by the WASC-S; thus, there is no support whatsoever for the subsistence economy hypothesis for the female sample.

Having examined the effects of the four variables on performance, we now turn to look at their influence on motivation. As Table 4.17 shows, for the males, the total contribution of these four variables in terms of percentages is 0.8 made up as follows: parents' education, 0.4 percent; (b) location of schools, 0.2 percent; (c) religion, 0.2 percent; and (d) food area, 0.0 percent.

Independently, the variables have no significant influence on motivation as represented by the M-Scale total scores.

For the female sample, and as illustrated in Table 4.18, when the simultaneous influences of all four variables are taken into account, religion is the only variable that makes a significant contribution at better than .01 confidence level. Of the total variance contribution of 7.6 percent made by all the four variables, religion contributed 5.4 percent; and this contribution means that nine point M-Scale total disadvantage accrues to Protestants. Thus religion is the only variable that affects motivation for the girls, the advantage, of course, being in favor of Catholics.

In order to complete the pattern of relationship among variables and their predictive influences, the final hypothesis states that

Table 4.17.--Stepwise regression analysis: M-Scales total scores as function of food area, parents' education, religion, and location of schools for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 594.41 | 594.41 | 0.00 | 0.00 | 1.60 | 19.27 | PE | 3.18 | 2.52 | 1.26 | 147.21 | | M-TOTAL |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | PE | 3.05 | 2.52 | 1.21 | | | |
| 217.53 | 811.94 | 0.00 | 0.01 | 1.09 | 19.28 | LS | 1.55 | 2.02 | 0.77 | 146.55 | | M-TOTAL |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | PE | 2.69 | 2.56 | 1.05 | | | |
| | | | | | | LS | 1.92 | 2.06 | 0.93 | | | |
| 288.36 | 1100.30 | 0.00 | 0.01 | 0.99 | 19.28 | R | 1.82 | 2.07 | 0.88 | 145.59 | | M-TOTAL |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | PE | 2.59 | 2.58 | 1.00 | | | |
| | | | | | | LS | 1.83 | 2.09 | 0.88 | | | |
| | | | | | | R | 1.78 | 2.08 | 0.86 | | | |
| 36.30 | 1136.60 | 0.00 | 0.01 | 0.76 | 19.31 | FA | 0.64 | 2.05 | 0.31 | 145.33 | | M-TOTAL |

Table 4.18.--Stepwise regression analysis: M-Scales total scores as function of food area, parents' education, religion, and location of schools for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 2394.37 | 2394.37 | 0.05 | 0.05 | 6.23 | 19.60 | R | -9.26 | 3.71 | -2.50 | 187.86 | -0.23 | M-TOTAL |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | R | -10.19 | 3.77 | -2.70 | | | |
| 627.53 | 3021.91 | 0.01 | 0.07 | 3.96 | 19.55 | FA | -4.85 | 3.79 | -1.28 | 190.99 | | M-TOTAL |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | R | -10.57 | 3.79 | -2.79 | | | |
| | | | | | | FA | -5.44 | 3.83 | -1.42 | | | |
| 374.59 | 3396.50 | 0.01 | 0.08 | 2.96 | 19.55 | PE | 4.19 | 4.23 | 0.99 | 190.37 | | M-TOTAL |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | R | -10.51 | 3.87 | -2.72 | | | |
| | | | | | | FA | -5.47 | 3.87 | -1.42 | | | |
| | | | | | | PE | 4.24 | 4.24 | 0.99 | | | |
| 3.38 | 3399.88 | 0.00 | 0.08 | 2.20 | 19.64 | LS | 0.87 | 9.28 | 0.09 | 190.31 | | M-TOTAL |

each of the four variables has an independent influence on the determination of each of the M-Scale sub-scale scores.

Starting with the males, we find that the GSCI (Table 4.19) is not affected by any of the four characteristic variables. The total variance contribution of all four of them is 1.3 percent. None of them has any coefficient that shows any significant effect. The same observation is true of the GSCI females (Table 4.20), the PJCS males (Table 4.21) and females (Table 4.22), the WRL males (Table 4.23), and the HTI males (Table 4.25). But WRL for females is significantly affected by the religion variable. Religion contributes 6.9 percent variance in WRL as shown in Table 4.24. Its coefficient shows a statistically significant effect ($\underline{t}$ = 3.15) at better than .01 confidence level. All things considered, therefore, we can safely say that in predicting the motivational sub-components, no background characteristic made any significant difference to GSCI or PJCS. However, religion is a significant predictor of WRL for girls with about six point disadvantage accruing to being Protestant over being Catholic. This is what is really accounting for the religious effect on M-Scale total scores, that is, the effect of religion on one specific sub-scale, and not on the whole index. In the same way, the HTI (Table 4.26) for females is affected by the food area variable. However, food area has barely a significant independent influence ($\underline{t}$ = 2.03) on determining HTI, with about two point advantage attributable to heartlanders over fringers. This weak relation is hidden when the HTI is combined with the other sub-components into the M-Scale total.

Table 4.19.--Stepwise regression analysis: GSCI as function of food area, parents' education, religion, and location of schools for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 50.04 | 50.04 | 0.01 | 0.01 | 2.88 | 4.17 | PE | 0.92 | 0.54 | 1.70 | 40.57 | | GSCI |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | PE | 0.97 | 0.55 | 1.79 | | | |
| 29.21 | 79.25 | 0.01 | 0.01 | 2.29 | 4.17 | LS | -0.57 | 0.44 | -1.30 | 40.81 | | GSCI |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | PE | 1.02 | 0.55 | 1.84 | | | |
| | | | | | | LS | -0.61 | 0.45 | -1.37 | | | |
| 4.00 | 83.26 | 0.00 | 0.01 | 1.60 | 4.17 | R | -0.21 | 0.45 | -0.48 | 40.93 | | GSCI |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | PE | 1.00 | 0.56 | 1.79 | | | |
| | | | | | | LS | -0.62 | 0.45 | -1.39 | | | |
| | | | | | | R | -0.22 | 0.45 | -0.49 | | | |
| 1.07 | 84.33 | 0.00 | 0.01 | 1.21 | 4.18 | FA | 0.11 | 0.44 | 0.25 | 40.88 | | GSCI |

Table 4.20.--Stepwise regression analysis: GSCI as function of food area, parents' education, religion, and location of schools for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 13.13 | 13.13 | 0.01 | 0.01 | 1.03 | 3.58 | PE | 0.77 | 0.76 | 1.01 | 34.43 | | GSCI |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | PE | 0.84 | 0.77 | 1.08 | | | |
| 5.04 | 18.17 | 0.00 | 0.01 | 0.71 | 3.59 | LS | 1.04 | 1.66 | 0.63 | 34.36 | | GSCI |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | PE | 0.84 | 0.78 | 1.09 | | | |
| | | | | | | LS | 0.97 | 1.70 | 0.57 | | | |
| 0.50 | 18.67 | 0.00 | 0.01 | 0.48 | 3.60 | R | -0.14 | 0.70 | -0.20 | 34.43 | | GSCI |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | PE | 0.84 | 0.79 | 1.06 | | | |
| | | | | | | LS | 0.96 | 1.71 | 0.56 | | | |
| | | | | | | R | -0.13 | 0.71 | -0.18 | | | |
| 0.03 | 18.71 | 0.00 | 0.01 | 0.36 | 3.62 | FA | 0.04 | 0.71 | 0.05 | 34.41 | | GSCI |

Table 4.21.--Stepwise regression analysis: PJCS as function of food area, parents' education, religion, and location of schools for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 47.44 | 47.44 | 0.01 | 0.01 | 3.27 | 3.81 | PE | 0.90 | 0.50 | 1.81 | 22.35 | | PJCS |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| 15.83 | 63.26 | 0.00 | 0.01 | 2.18 | 3.81 | PE<br>R | 0.82<br>0.42 | 0.50<br>0.40 | 1.64<br>1.05 | 22.16 | | PJCS |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| 6.04 | 69.30 | 0.00 | 0.01 | 1.59 | 3.81 | PE<br>R<br>LS | 0.79<br>0.47<br>0.26 | 0.51<br>0.41<br>0.41 | 1.57<br>1.15<br>0.65 | 22.03 | | PJCS |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| 2.02 | 71.32 | 0.00 | 0.01 | 1.22 | 3.82 | PE<br>R<br>LS<br>FA | 0.77<br>0.46<br>0.24<br>0.15 | 0.51<br>0.41<br>0.41<br>0.41 | 1.51<br>1.13<br>0.59<br>0.37 | 21.97 | | PJCS |

Table 4.22.--Stepwise regression analysis: PJCS as function of food area, parents' education, religion, and location of schools for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 104.03 | 104.03 | 0.01 | 0.01 | 1.35 | 8.79 | R | -1.93 | 1.66 | -1.16 | 49.95 | | PJCS |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | R | -2.05 | 1.67 | -1.23 | | | |
| 74.74 | 178.77 | 0.01 | 0.02 | 1.16 | 8.79 | PE | 1.85 | 1.88 | 0.98 | 49.51 | | PJCS |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | R | -1.72 | 1.70 | -1.01 | | | |
| | | | | | | PE | 2.07 | 1.89 | 1.09 | | | |
| 75.44 | 254.21 | 0.01 | 0.03 | 1.10 | 8.79 | LS | 4.09 | 4.14 | 0.99 | 49.11 | | PJCS |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | R | -1.66 | 1.74 | -0.95 | | | |
| | | | | | | PE | 2.01 | 1.93 | 1.04 | | | |
| | | | | | | LS | 4.02 | 4.17 | 0.96 | | | |
| 2.83 | 257.04 | 0.00 | 0.03 | 0.83 | 8.83 | FA | 0.33 | 1.74 | 0.19 | 48.92 | | PJCS |

Table 4.23.--Stepwise regression analysis: WRL as function of food area, parents' education, religion, and location of schools for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 297.24 | 297.24 | 0.01 | 0.01 | 1.97 | 12.27 | R | 1.80 | 1.28 | 1.41 | 53.56 | | WRL |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | R | 2.08 | 1.30 | 1.60 | | | |
| 196.64 | 493.88 | 0.00 | 0.01 | 1.64 | 12.27 | LS | 1.49 | 1.31 | 1.14 | 52.75 | | WRL |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | R | 1.93 | 1.32 | 1.47 | | | |
| | | | | | | LS | 1.40 | 1.31 | 1.07 | | | |
| 73.43 | 567.31 | 0.00 | 0.01 | 1.26 | 12.27 | PE | 1.14 | 1.63 | 0.70 | 52.64 | | WRL |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | R | 1.89 | 1.32 | 1.43 | | | |
| | | | | | | LS | 1.32 | 1.33 | 0.99 | | | |
| | | | | | | PE | 1.05 | 1.64 | 0.64 | | | |
| 28.39 | 595.71 | 0.00 | 0.01 | 0.99 | 12.29 | FA | 0.57 | 1.31 | 0.43 | 52.41 | | WRL |

Table 4.24.--Stepwise regression analysis: WRL as function of food area, parents' education, religion, and location of schools for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 996.13 | 996.13 | 0.07 | 0.07 | 8.11 | 11.08 | R | -5.97 | 2.10 | -2.85 | 63.24 | -0.17 | WRL |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | R | -6.64 | 2.12 | -3.13 | | | |
| 326.94 | 1323.07 | 0.02 | 0.09 | 5.47 | 11.00 | FA | -3.50 | 2.13 | -1.64 | 65.49 | | WRL |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | R | -6.82 | 2.13 | -3.20 | | | |
| | | | | | | FA | -3.78 | 2.16 | -1.75 | | | |
| 80.93 | 1403.99 | 0.01 | 0.10 | 3.86 | 11.01 | PE | 1.95 | 2.38 | 0.82 | 65.21 | | WRL |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | R | -6.87 | 2.18 | -3.15 | | | |
| | | | | | | FA | -3.75 | 2.18 | -1.72 | | | |
| | | | | | | PE | 1.91 | 2.42 | 0.79 | | | |
| 1.92 | 1405.92 | 0.00 | 0.10 | 2.87 | 11.06 | LS | -0.66 | 5.23 | -0.13 | 65.26 | | WRL |

Table 4.25.--Stepwise regression analysis: HTI as function of food area, parents' education, religion, and location of schools for males.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 96.50 | 96.50 | 0.01 | 0.01 | 4.43 | 4.67 | LS | 1.03 | 0.49 | 2.11 | 29.70 | | HTI |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | LS | 0.93 | 0.50 | 1.88 | | | |
| 21.24 | 117.74 | 0.00 | 0.02 | 2.70 | 4.67 | R | -0.49 | 0.49 | -0.99 | 29.97 | | HTI |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | LS | 0.97 | 0.50 | 1.92 | | | |
| | | | | | | R | -0.47 | 0.50 | -0.95 | | | |
| 4.18 | 121.92 | 0.00 | 0.02 | 1.86 | 4.67 | FA | -0.22 | 0.49 | -0.44 | 30.06 | | HTI |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | LS | 0.98 | 0.51 | 1.94 | | | |
| | | | | | | R | -0.44 | 0.50 | -0.88 | | | |
| | | | | | | FA | -0.19 | 0.50 | -0.39 | | | |
| 2.73 | 124.65 | 0.00 | 0.02 | 1.43 | 4.68 | PE | -0.22 | 0.63 | -0.35 | 30.07 | | HTI |

Table 4.26.--Stepwise regression analysis: HTI as function of food area, parents' education, religion, and location of schools for females.

| SS | CSS | PR ($R^2$) | CPR ($R^2$) | F-Value | SE-est | Pred'g Var. | RCo | SERCo | T-Value | Intercept | SRCo | Pred'd Var. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | FOR VARIABLE ONE ENTERED | | | | | | |
| 93.18 | 93.18 | 0.04 | 0.04 | 4.13 | 4.75 | FA | -1.83 | 0.90 | -2.03 | 40.48 | | HTI |
| | | | | | | FOR VARIABLE TWO ENTERED | | | | | | |
| | | | | | | FA | -2.12 | 0.91 | -2.32 | | | |
| 57.74 | 150.93 | 0.02 | 0.06 | 3.39 | 4.72 | R | -1.47 | 0.91 | -1.61 | 41.33 | | HTI |
| | | | | | | FOR VARIABLE THREE ENTERED | | | | | | |
| | | | | | | FA | -2.02 | 0.91 | -2.22 | | | |
| | | | | | | R | -1.73 | 0.92 | -1.88 | | | |
| 50.60 | 201.53 | 0.02 | 0.08 | 3.06 | 4.69 | LS | -3.33 | 2.20 | -1.52 | 41.55 | | HTI |
| | | | | | | FOR VARIABLE FOUR ENTERED | | | | | | |
| | | | | | | FA | -1.97 | 0.93 | -2.13 | | | |
| | | | | | | R | -1.71 | 0.93 | -1.84 | | | |
| | | | | | | LS | -3.42 | 2.23 | -1.54 | | | |
| 1.97 | 203.50 | 0.00 | 0.08 | 2.30 | 4.71 | PE | -0.31 | 1.03 | -0.30 | 41.60 | | HTI |

## Factor Analysis

The third and fourth objectives of the study are concerned with the factorial structures of the responses of the Ibo males and females to the GSCI and comparison of the resulting factors with those found for American whites and blacks. To do this involved the following steps: (1) the developing of the correlational matrix expressing the correlation between each pair of variables (see Appendix E for one such matrix); (2) putting the matrix through the first process of producing the unrotated matrix of principal components,[7] from which the minimum number of separate factors required to account for the data can be identified; (3) calculating and examining the percentage of variance explained, and thus noting the ultimate number of factors that would be needed, in this case five for the boys and six for the girls; (4) rotating the data through the quartimax[8] procedure (counterchecked by the varimax[9] method) which produced the factor loadings[10] (Since the

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[7]The principal axis or component defines the factor or basic dimension the variables are measuring in common.

[8]The quartimax method focuses on simplifying the rows of the factor matrix so that each variable loads on the fewest possible factors, and at the same time loads zero or near-zero on the remaining factors.

[9]The varimax method, unlike the quartimax, involves cleaning up factors along the columns of a factor matrix. For each factor, varimax rotation yields high loadings for a few variables, while the rest of the loads along the factor column are zero or near-zero. What is reported in this study is the quartimax results. The checking was to see if the resulting factors would vary.

[10]Loadings mean the factor coefficients. These can have a positive or a negative loading, and the sign tells if the factor is operating to raise or lower the score on a particular measure. See David Fox, The Research Process in Education (New York: Holt, Rinehart and Winston, Inc., 1969), pp. 216-218.

intention was to learn as much as possible about the Ibo factor patterns, other sequential rotations that produced 4-3 factors for males and 5-4-3-2 factors for females were not reported. See Appendices F and G.); (5) naming the factors. See Tables 4.27 through 4.31 for the males and Tables 4.32 through 4.37 for the females. Since the eigenvalue threshold[11] was set at 1.00 for the five male and six female factors, it was decided to use them for the reporting of the results. Based on previous experience, the acceptable level of factor loading was set at .4 or closest; and each factor in both samples had to have, at least, three highest loadings to be considered significant.[12]

## Results of the 53-Item and 45-Item[13] Variable Analyses

In relation to the Ibo males, four factors emerged. What would have been Factor IV could not be named because of its single load on one item. Its variance contribution was, however, the highest. The factors are:

1. chance-taking versus non-chance-taking,
2. intrinsic satisfaction versus external superficiality,
3. problem-solving effectiveness,
4. no factor, and
5. n-academic achievement.

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[11] Eigenvalue is the latent root of a matrix. Setting it at 1.000 means extracting all possible factors from the data domain.

[12] Previous studies have adopted this consideration. See Johnson, op. cit., p. 38.

[13] Item 19 of this test had no variance; hence it was deleted from the entire analysis of 46 variables.

For the females, the study indicated that six factors accounted for most of the variance among the items. The resultant factors are:

1. n-academic achievement,
2. unique versus common accomplishment,
3. work-success involvement,
4. self-reliance versus inadequacy of self,
5. delayed gratification versus immediate gratification, and
6. task orientation versus leisure.

The factors with their item content and the loading of each item are presented in Tables 4.27 through 4.31 for males and Tables 4.32 through 4.37 for females.

## The Male Factors

Factor 1 (chance-taking versus non-chance-taking) is second in terms of accounting for the variance of the items. Items 6, 23, 24, and 40 were about equally and moderately loaded on this factor.

Four items, variables 20, 22, 38, and 52 loaded highest on Factor II (intrinsic satisfaction versus external superficiality). Each of the variables separates internal satisfaction from external expression of happiness.

Factor III (problem-solving effectiveness) loads on variables 3, 11, 37, and 50. Variables 3-11 and 37-50 polarize the ideas when considered separately; but both coalesce into problem-solving when considered in combination. This factor accounts least of all the other factors in terms of variance contribution.

Table 4.27.--Factor I: Chance-taking versus non-chance-taking (male).[a]

| Item Number and Content | Loading |
|---|---|
| 6. a. Have the teacher give everyone the same grade at the beginning of the term and know I had passed, or | |
| b. Take chances on getting a higher or lower grade at the end of the course | +.449 |
| 23. a. Have average ability and be liked by many people, or | |
| b. Have superior ability but not be liked by as many people | +.407 |
| 24. a. Have everybody in the class get a "C" at the beginning of the course, or | |
| b. Be graded at the end of the course with the possibility of getting a higher or lower mark | +.413 |
| 40. a. Do something like everyone else, or | |
| b. Do something outstanding | +.457 |

[a]Tables 4.13, 4.14, 4.15, 4.16, and 4.17 pertain to 53-item factor analysis.

Table 4.28.--Factor II: Intrinsic satisfaction versus external superficiality (male).

| Item Number and Content | Loading |
|---|---|
| 20. a. Work rapidly just "skimming" along, or | |
| b. Work slowly with great thoroughness | -.434 |
| 22. a. Have a great deal of money, or | |
| b. Be an expert in my favorite school subject | -.489 |
| 38. a. Be very happy, or | |
| b. Have lots of money | -.539 |
| 52. a. Enjoy myself at a museum, or | |
| b. Enjoy myself at a nightclub | -.484 |

Table 4.29.--Factor III: Problem-solving effectiveness (male).

| Item Number and Content | Loading |
|---|---|
| 3. a. Have the best teachers in the State in my school, or | |
| b. Have a large recreation center in my school | -.420 |
| 11. a. Be graded at the end of a course with the possibility of making an "A," or | |
| b. Get a "C" at the beginning of a course along with everyone else | -.442 |
| 37. a. Be known as being a "good guy" or a "good gal," or | |
| b. Be known as a person who "does things well" | -.395 |
| 50. a. Be known as a person who does not let problems worry me, or | |
| b. Be known as a person who can solve problems | -.542 |

Table 4.30.--Factor IV.[a]

| Item Number and Content | Loading |
|---|---|
| 44. a. Discover a gold mine, or | |
| b. Discover a new medicine | +.737 |
| 53. a. Discover a gold mine, or | |
| b. Discover a new medicine | +.768 |

[a]Factor not named.

Table 4.31.--Factor V: N-academic achievement (male).

| Item Number and Content | Loading |
|---|---|
| 32. a. Wait until I had finished university and make a better salary, or | |
| b. Get a job right after secondary school and make a good salary | -.578 |
| 34. a. Study to go to University, or | |
| b. Study to get out of secondary school | -.406 |
| 47. a. Be well prepared for a job after graduation from secondary school, or | |
| b. Be well prepared to continue learning | -.663 |

What would have been Factor IV had a single highest load of +.768, hence could not be named; but it accounted for more variance of the items than any of the other factors. Items 32, 34, and 47 loaded highest on Factor V (n-academic achievement), which accounts for more variance of the items than the other male factors, when the unnamed Factor IV is eliminated.

The Female Factors

Factor I (n-academic achievement) contributed significantly to the variance of the items. The highest loading variables deal with concern regarding university education versus secondary school education. All three highest loading items deal with school and academic work.

Three items load highest on Factor II (unique versus common accomplishment). This factor ranks third in order of contribution to the overall variance. Item 46 provides the name for the factor. The other variables also point toward uniqueness, different from the commonplace events of being a "guy" or a "gal" or enjoyment at a nightclub.

Factor III (work-success involvement) accounts for more variance of the items than all the other factors. It loads highest on items 17, 18, and 40. All three variables of this factor convey the impressions of working hard, determining to succeed through own effort, as opposed to planlessness or dependence on others--a factor that militates against initiative and success in life.

The central theme of Factor IV (self-reliance versus inadequacy of self) is trust or confidence. It takes confidence or positive self-regard for one to want to continue his learning, defeat an expert or

Table 4.32.--Factor I: N-academic achievement (female).[a]

| Item Number and Content | Loading |
|---|---|
| 4. a. Have the best teachers in my school, or | |
| b. Have a large recreation center in my school | -.602 |
| 7. a. Pass a usual classroom examination, or | |
| b. Pass a university entrance examination | -.455 |
| 23. a. Study to go to a university, or | |
| b. Study to get out of secondary school | -.768 |

[a]Tables 4.17, 4.18, 4.19, 4.20, 4.21, and 4.22 pertain to 45-item factor analysis for female Ibo students.

Table 4.33.--Factor II: Unique versus common accomplishment (female).

| Item Number and Content | Loading |
|---|---|
| 24. a. Enjoy myself at a museum, or | |
| b. Enjoy myself at a nightclub | +.518 |
| 25. a. Be known as being a "good guy" or a "good gal," | |
| b. Be known as a person who "does things well" | +.428 |
| 45. a. Do something like everyone else, or | |
| b. Do something outstanding | +.681 |

Table 4.34.--Factor III: Work-success involvement (female).

| Item Number and Content | Loading |
|---|---|
| 17. a. Work hard in everything I do, or | |
| b. Work at things as they come along | -.778 |
| 18. a. Study my assignments during free period, or | |
| b. Wait to study until the mood strikes me | -.561 |
| 40. a. Memorize someone else's poem, or | |
| b. Create a peom of my own | -.549 |

Table 4.35.--Factor IV: Self-reliance versus inadequacy of self (female).

| Item Number and Content | Loading |
|---|---|
| 6. a. Be well prepared for a job after graduation from secondary school, or | |
| b. Be well prepared to continue learning | -.623 |
| 29. a. Learn by defeating an experienced player, or | |
| b. Learn by losing to an expert | +.458 |
| 33. a. Draw a freehand picture, which may or may not be good, or | |
| b. Trace an excellent picture drawn by someone else | -.432 |
| 41. a. Work overtime to make more money, or | |
| b. Get more schooling to make more money | -.487 |

Table 4.36.--Factor V: Delayed gratification versus immediate gratification (female).

| Item Number and Content | Loading |
|---|---|
| 3. a. Be thought of as being a studious person, or | |
| b. Be thought of as being a carefree person | -.425 |
| 21. a. Wait ten years and receive fame throughout the nation, or | |
| b. Receive fame in my community overnight | -.508 |
| 22. a. Wait until I had finished university and make a better salary, or | |
| b. Get a job right after secondary school and make a good salary | -.660 |
| 27. a. Study for an exam one night and know that I would receive an "A," or | |
| b. Go to a party on this night and take a chance on a lower grade | -.497 |
| 44. a. Be able to say I had successfully completed a task, or | |
| b. Be able to say I had attempted a difficult task | +.475 |

Table 4.37.--Factor VI: Task orientation versus conspicuous leisure (female).

| Item Number and Content | Loading |
|---|---|
| 1. a. Work hard for what I want, or | |
| b. Just get what I want | -.542 |
| 12. a. Be a person of leisure, or | |
| b. Be a person of action | -.456 |
| 16. a. Be an able person, or | |
| b. Be wealthy | -.544 |
| 39. a. Be known for what I could do, or | |
| b. Be known for what I do | +.554 |

experienced player, and draw his own picture instead of copying unmindful of obvious criticisms or results.

Items 21 and 22 loaded highest on Factor V (delayed versus immediate gratification); so also did items 3 and 44. Items 21 and 22 directed thought on the naming of the factor.

Factor VI (task orientation versus leisure) loaded highest on items 1, 12, 16, and 39. All items suggest a dichotomy between smugness and going all out to get that for which the individual yearns. The factor emphasizes acquisition by, as opposed to ascription to, the individual. The central theme is doing, thus emphasizing a new trend of disinclination toward conspicuous leisure.

The hypothesis tested in this connection was:

$H_{14}$ There is no difference in factorial structure between the fifth formers' responses to the GSCI and the responses of the American whites and Afro-Americans on the same instrument.

Since the emergent factors in any factorial study are a function of the characteristics of the subjects of the study, it is, therefore, understandable that the factors of this study are not exactly like those established in previous studies, in terms of order, name, and variance contribution.

But the contents of the factors are similar to those of some earlier investigations. Three of the male factors are similar to those established by Thorpe on Caucasians or Green on American Negroes. Problem-solving effectiveness is the only factor peculiar to Ibo male

sample when compared with either Thorpe's[17] or Green's.[18] Similarly, delayed versus immediate gratification and task orientation are peculiar to the Ibo female sample when compared to Johnson's Indian males. If he had worked on Indian females, the comparison would have been apt.

## Summary

Group A males scored significantly higher (.05 level of confidence or better) than group B males on the WASC-S. There was no difference between scores of group A girls and group B girls, however.

No significant differences were found between the scores of Protestant and Catholic male students; but t-indices indicated differences significant at the .05 level or better in WRL, HTI, M-TOTAL, and WASC-S for the females, with Catholics consistently scoring higher than Protestants.

There were no significant differences between the scores of female children of uneducated parents compared to daughters of educated parents. However, significant differences showed up in the male GSCI and PJCS, where the sons of educated parents scored higher than the sons of uneducated parents.

The t-indices showed differences between urban and rural boys significant at the .05 level in HTI and WASC-S, the urban students scoring higher than the rural students.

The stepwise regression analysis showed that the M-Scales total score of itself predicted significantly 9 and 20 percent of the variance

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[17] Thorpe, op. cit. [18] Green, op. cit.

Table 4.38.--Summary of derived factors.

| Thorpe's Caucasian Males | Green's Negro Males | Ibo Males | Ibo Females |
|---|---|---|---|
| 1. chance-taking versus non-chance-taking | chance-taking versus no chance-taking | chance-taking vs. no chance-taking | n-academic achievement |
| 2. n-academic achievement | n-academic achievement | intrinsic satisfaction versus external superficiality | unique versus common accomplishment |
| 3. intrinsicness versus extrinsicness | intrinsicness versus extrinsicness | problem-solving effectiveness | work-success involvement |
| 4. speed versus thoroughness | | n-academic achievement | self-reliance versus inadequacy of self |
| 5. situational involvement | situational involvement | | delayed gratification versus immediate gratification<br><br>task orientation versus conspicuous leisure |

in WASC-S, while it predicted 8 and 20.3 percent when entered simultaneously with the four characteristic variables, for males and females, respectively.

For both males and females, of the four characteristic variables only the location variable (13 percent) and parents' education (1.4 percent) for the male sample showed a significant contribution in the WASC-S. In effect, only the location variable, for the boys, stood out as a major influence.

The M-Scales total scores predicted WASC-S better than chance; the ability to do this depends on some sub-scales more than on others. In this study, the GSCI and the WRL are more important than the rest for the boys. Not much would be lost if the other two sub-scales were eliminated. For the females, three of the sub-scales appeared to be important, namely: the WRL (10.9 percent), the HTI (5.3 percent), and the GSCI (3.3 percent). Elimination of the PJCS (1.5 percent) would not make much difference.

The relative strength of the four sub-scales was examined in conjunction with the other characteristic variables. It turned out that the GSCI was the strongest sub-scale for the boys while the WRL was the strongest for the girls.

Apart from the location variable in the male sample, no other characteristic variable had any effect on academic performance.

When the religion variable was removed for the female sample, no other variables for either males or females made any appreciable contribution in motivation. Similarly, no characteristic variable had an independent influence on the determination of the M-Scale

sub-scale scores, except the religion variable for females, which explained 6.9 percent variance of the WRL.

The factors that were derived from the 53- and 45-item analysis for males and females, respectively, yielded the following factor patterns:

A. For the males the following emerged:
    1. chance-taking versus no chance-taking
    2. intrinsic satisfaction versus external superficiality
    3. problem-solving effectiveness
    4. n-academic achievement

B. For the females the following emerged:
    1. n-academic achievement
    2. unique versus common accomplishment
    3. work-success involvement
    4. self-reliance versus inadequacy of self
    5. delayed gratification versus immediate gratification
    6. task orientation

The patterns were similar to the findings of previous studies; but they differed in variance contribution, order, and in name in some instances.

# CHAPTER V

## SUMMARY AND CONCLUSION

In this final section of the report, we come to conclusions regarding the problems defined at the start of the study. In order to guide the reader, the presentation of the findings of the study will focus on the objectives stated earlier in the report. These will be followed by consideration of the derived objectives--derived in the sense of logical outgrowth from the main points.

### Differences in Academic Achievement Motivation Between Group A and Group B Using the M-Scales

The first and most important objective of the study was to explore the differences in academic achievement motivation between heartlanders (group A) and fringers (group B) using the M-Scales. The importance of this objective derives from stereotypic attitudes of Ibos about those who live in areas where there is either a scarcity or plenty of food. We found no differences in academic achievement motivation between these two groups either on the M-Scales total scores or on the sub-components for both sexes. But a significant difference was found in performance in favor of heartlanders over fringers for the boys samples only. There was no difference in performance between the girl samples.

Reflection on this no difference result in motivation leads to a number of possible interpretations. In the first place, this result

raises the question of the suitability of the measuring instrument. Since the scales were devised in America, one can question their applicability in this particular cultural environment. In other words, one can say that the instrument may not be culture fair. This interpretation seems unlikely, however. We found the M-Scales to be predictive of achievement among the Ibos as results show. Also, the derived factors from factor analysis corroborate findings of some previous studies, as applied to males only, in environments different from that studied, demonstrating support for the hypothesis of no factorial difference between Ibo male fifth formers on the one hand, and male American whites and Negroes on the other. Although the factorial pattern for Ibo girls was different from any of the three male population samples, we thus have evidence that the tests are producing similar results at least for the Ibo males as for the samples in previous studies. Again, nothing in the test items themselves suggests that they are culturally unfair to the Nigerian children. The changing of certain terminologies like high school to secondary school, college to university which are local equivalents lend support also to the contention that the tests are fair. Mean scores either on the total scale or on sub-components are similar to those reported by earlier researchers like Van Johnson.[1] From these evidences, it is unlikely that the notion that the no difference result was due to the unfairness of the measuring instrument is tenable.

However, there is the problem of sample bias that must be considered. The no difference result might be a function of limited

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[1] Johnson, op. cit.

sample range. In Nigeria, boys and girls do not go to secondary schools as a matter of course; they have to pass screening tests. Screening continues until they reach the final form of the secondary school. This is not the case with American schools where the measuring instruments were devised. There is, therefore, a bias in the Ibo sample simply as a result of the selection process for secondary school. And since the Ibo sample is of a highly selected nature, in terms of ability and motivation, this might dilute the sensitivity of measures (which may not be very sensitive to begin with) to the point where a no difference result occurs even though there is a real difference between the groups studied--in this case, between A and B. The resolution of the problem created by this selectivity will await the implementation of the Federal Nigerian proposed free and compulsory education.

In pursuance of the sampling question, one may wish to examine if the no difference result is due to defective sampling adopted by the study. In response, one can only say that the random sampling technique adopted did not lend itself to bias. The method of selection was impartial. The characterizations of groups in the preliminary part of this report are records of outward manifestations of people that do not necessarily reflect their academic motivational patterns. These descriptions suggest the existence of differences which have turned out in the results not to exist.

Previous studies, notably those of Pettigrew[2] and Hayden,[3] have demonstrated that the M-Scales are inadequate for older subjects,

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[2]Pettigrew, op. cit.

[3]Hayden, op. cit.

especially college samples. In this study, owing to the vagaries of war, the average ages were 19.9 for boys and 19.6 for girls. These are the ages at which the brighter ones among them should have been in the universities. If in fact the M-Scales are strictly not for samples of college age, then age can contribute to the kind of result recorded in this study. What would be recommended in this connection is a type of stratified sample that would discard those in the intermediate zones on either side of the fringe and heartland, and then to make sure that age is controlled. If after the replication the results remained the same we would have then an incontrovertible evidence that both groups of Ibos are the same in academic achievement motivation.

Thus far, we have attributed the cause of no difference result to other considerations. It is, of course, possible that the hypothesized difference between groups A and B is not a real one. Our study does not make it possible to prove this one way or the other. In effect, the subsistence economy hypothesis around which the difference was suggested cannot be proved either. If the hypothesis is evaluated through this study, the inclination would be to say it does not work, it is not valid. It could be valid in another situation different from the Ibo environment. In order not to throw away the child with the bath, a replication using two or more different ethnic groups is suggested. (Intra-ethnic comparisons, as against inter-ethnic, may mask the true picture about this hypothesis.) In this way can we judge whether or not the hypothesis is of any real value. For now, the issue should be regarded as inconclusive, even with the food area variable showing a minimal effect in performance for males.

## Academic Achievement as Measured by M-Scales

The second objective was to see how the M-Scales would predict academic achievement in Iboland. The finding was that a significant variance in performance was predicted by the scales, with predictive power being greater for the girls than for the boys. Although the M-Scales predicted a substantial variance in performance, the overall explanatory power of the model is not very high. When all four background variables were combined with the M-Scales total scores their aggregate variance contribution in performance was not greater than 25 percent in both the boys' or girls' samples. Specifically the M-Scales total scores contributed about 10 percent for the boys and about 20 percent for the girls. These are below the reported figures in Farquhar's project 846. His model predicted 31 percent variance in performance for the boys and 16 percent for the girls. For the cross-validation groups, it predicted about 24 percent for the boys and 23.5 percent for the girls. A predictive coefficient which is based on a group that is highly homogeneous in ability (as is the case with the Ibo youths) is likely to be low for that reason alone, in comparison with such a coefficient from a group that is heterogeneous in ability (as was the case with Farquhar samples). We can, therefore, say that the low explanatory power of our model is due to restricted range in ability and other traits among Ibo youths.

Another way of looking at the problem would be to try to recapture the information about the true predictive value of the test for the entire group of Ibo students by estimating a predictive coefficient by extension using an appropriate formula. If in doing that

our figures corroborate those of Farquhar, we would have a basis for saying that the M-Scale is doing about the same thing for the Ibo youths that it did for his samples. Otherwise, our conclusion would be that the subjects of Farquhar's study have higher motivations than the Ibo students.

However, it may well be that motivation cannot be much higher than the reported figures in predicting school performance since there is more to performance than mere motivation. Motivation is an aid to the release of the latent intellectual abilities in school. Performance is invariably, other things being equal, a function of intelligence and aptitude. This would explain why prediction was improved in the Farquhar study when aptitude scores were added to his motivational model. Motivation, as catalyst to intelligence and aptitude, cannot take their place in influencing performance no matter how high it is; nor can other background variables take their place either. Motivation and background variables do make contributions to performance, but theirs will always remain complementary to the effects of intelligence and aptitude. This, perhaps, is what the model in this study has demonstrated. We cannot at the moment answer the question of the upper limit of motivational effects in performance in research of this nature. To answer such a question would require a series of studies employing the stepwise regression model, and using IQ and aptitude as important variables with samples that are heterogeneous in nature.

## Underlying Factorial Structure: Comparison With U.S. Patterns

The third and fourth major objectives of the study concerned with the factorial structure of the responses of the students to the Generalized Situational Choice Inventory were designed specifically to measure academic motivation. The aim was to try to understand the types of factors involved in their academic motivation and to compare the derived factors with those of previous studies. Since factor derivation is related to the characteristics of respondents, what emerged has thrown light on whether or not Nigerian fifth formers react differently from their American counterparts. It has also shown the underlying factors that account for the nature of their academic motivation. As it turned out, the boys had three factors in common with either American whites or Negroes, namely: chance-taking versus no chance-taking, intrinsic satisfaction versus extrinsicness (external superficiality for the Ibos), and need academic achievement. Only one factor is peculiar to the Ibo boys, that is, problem-solving effectiveness. Ibo boys have similar pattern with their American counterparts, but the derived factors differed in variance contribution and ordering.

What do these factors suggest about these Ibo boys? Factor I shows that these boys want to work hard for what they get. They would not, for instance, like to have the teacher give everyone the same grade at the beginning of the term and know, at least, that they would not fail the course; rather they would prefer to take chances on getting a higher or lower grade at the end of the course. They would

prefer to have superior ability but not be liked by many people to possessing average ability but be liked by many people. They would prefer to do something outstanding rather than do something like everyone else, even though they are aware that outstanding accomplishments involve risks.

Factor II shows that those boys with higher motivation would prefer those things that give internal satisfaction to those that are merely superficial. Thus, they would prefer to work slowly with great thoroughness instead of working rapidly, just "skimming" along. They would prefer to be experts in their favorite school subjects to having a great deal of money which to them is superficial. They would prefer internal happiness to having lots of money. They would prefer enjoyment at a museum to enjoyment at a nightclub. Here one sees the difference between the two enjoyments--one is intellectual, the other is not. Their intrinsic satisfaction is intellectual, and that is what they would prefer to non-intellectually challenging recreations.

Factor III shows their desire to solve problems effectively. These boys prefer to be known as persons who can solve problems, not just persons who do not allow problems to worry them. They prefer to be known as persons who "do things well" to being known as "good guys." They want to earn their "A's" in school instead of being granted a "C" pass by the teacher.

Factov V[4] shows need for academic achievement. These boys want to be well prepared to continue learning instead of being well

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[4]Factor IV could not be named because of its load on only one item.

prepared to continue learning instead of being well prepared for a job after secondary school. They want to study to get to university instead of studying to get out of secondary school. They want to wait until they have finished university and make better salary in preference to getting a job right after secondary school and making a good salary. All these preferences demonstrate a need for academic excellence in the boys.

Ibo boys and Ibo girls have different factor patterns. Boys and girls, however, had two factors in common, namely: need academic achievement and work-success (problem-solving for boys). All the others are different. Peculiar to the Ibo girls were the following factors: (1) unique versus common accomplishment, (2) self-reliance versus inadequacy of self, (3) delayed gratification versus immediate gratification, and (4) task orientation. The meaning behind these female factors seems to mirror their predicament in the Ibo male-oriented society. They need unique accomplishment to be recognized. Those who opt for the opposite may succumb to their fate. They need self-reliance if they will achieve success and recognition. Those who feel inadequate do not go far enough. They need patience for the desired results to come (delayed gratification). Those who do not have this patience achieve only common accomplishments, if at all, but nothing unique. They need hard work for fruitful results. Perhaps, those who surmount the cultural hurdles possess these characteristics. From the patterns that emerged, it is easy to see that both sexes have different motivational factors occasioned, perhaps, by their expected

roles in society. The boy has no need for inordinate involvement with motivation as does the girl, whose fate hangs on it.

Having disposed of the main objectives, we now turn to the five derived objectives of the study. They are derived in the sense that they are logical developments from the main objectives. They provided, as it were, the alternative hypotheses which enabled this study to make a balanced appraisal of the issues involved.

## Influence of Location of School

The first of these derived objectives concerned the influence of location of school. We wanted to know if urban or rural location of school is a significant factor in motivation and achievement.

In terms of male students in urban versus rural schools, no difference was found between the two groups in motivation based on M-Scale total analysis. However, based on the Human Trait Inventory scores, the urban male students were demonstrating more inclination toward school than did the rural male students. The boys in urban schools identified with their schools, showed more desire to be studious, worried more about their grades in school, saw more usefulness in their school subjects, and liked to plan for their courses more than did the rural boys. In short, the whole personalities of the boys in urban schools were attuned toward academic pursuits more than was the case with the boys in rural schools. These are what higher scores in the HTI suggest. When the whole motivational index is considered with this sample, the influence of the HTI is masked. If the HTI constituted the whole test of motivation, the distinction

between the two groups would have been clear-cut. But when all items in the index were taken together, location of school as a variable in itself had no effect on motivation either for the boys or for the girls.

Although students in urban and rural schools thus showed no difference in motivation, they did show a difference in achievement based on the WASC scores. The urban students had a mean difference advantage of nearly seven points in performance. This difference was highly significant. The result, therefore, ties up with the urban students' concern for grades, courses, and the like.

Location of school, as a variable for boys, predicted significantly more than half the total variance in performance predicted by five variables combined. In the girls' sample, it also predicted some 4 percent variance of performance significantly too. This particular outcome is striking in view of the small sample of urban girls involved in the analysis.

When we examine the results we have outlined, we come to the conclusion that the influence of location of school on performance cannot be due to any relation with motivation as measured by the M-Scales, but with something else directly affecting achievement. This emphasizes the point made earlier that the presence of motivation does not necessarily assure better performance. Motivation can only be most effective if it coexists with intellectual ability and aptitude. However, the finding of a difference in performance is consistent with traditional wisdom that urban children with urban vicarious experiences do better than rural children in school. These vicarious experiences

might explain why location of school is so important in performance for both sexes.

The challenging life of the urban area tends to attract the most intelligent and dedicated teachers. Richer experiences accrue to urban children through better-equipped libraries and laboratories than are found in rural schools. Some urban schools, because of the composition of staff and students, set high academic standards so that only the brighter students are comfortable in attending them. Of importance in this consideration also is that it seems bright youngsters in school exert considerable interaction effects among themselves for the academic benefits of those who attend such schools.

## Religion, Motivation, and Achievement

Next to be considered is religion. Has religion any effect on motivation? Who are more motivated, the Protestants or the Catholics? These are some of the questions to which answers are required. From our data emerged a no-difference result in motivation between male Catholics and Protestants. But there was a significant difference between females in favor of Catholics over Protestants. If we had stopped here, we would not have learned much about religion and its relationship with motivation for both sexes. A regression model enabled further examination to be undertaken. What came out was that religion contributed very little (.2 percent) in the motivation of the male students. This is, indeed, negligible. The situation was different for the girls. Religion made a significant contribution to motivation for the girls as a result of a relationship between religion and the measure of self-concept (WRL). If this component

were the whole index, religion would have a substantial influence on motivation especially for Catholic girls, who scored a seven-point advantage over their Protestant counterparts. However, this special relationship between Catholicism and self-concept as measured by the Word Rating List is not clear. One can only hazard a guess that since the WRL is a tool for self-examination (how my teacher might see me) which the Catholics do anyway in their confession, it is conceivable that the Catholic girls might have made a better examination of their self-concept through the test items.

Next, we take up the question, has religion any effect on achievement in school. Between Protestant and Catholic boys there was no difference in school performance; but between Protestant and Catholic girls there was a significant difference. Catholic girls had about a three-point mean performance advantage over Protestant girls. This was a major difference in that it achieved a 99 percent security. Proceeding further to understand the real relationship between religion and achievement for both sexes, it was discovered that religion in and of itself could only account for .4 percent of the variance in performance for boys and 2.1 percent for girls. Both contributions of religion to performance for both sexes were not statistically significant. It is, therefore, not religion that is accounting for the advantage the Catholic girls had over Protestant girls but some other fundamental consideration.

Looked at from the point of view of groups, there is consistency between motivation and achievement. There are no differences between Protestant and Catholic boys in motivation and achievement,

while the opposite is true for Protestant and Catholic girls. In other words, religious membership appears to be influential for the girls but not for the boys. The absence of a difference among boys and the existence of a difference among girls are both contrary to Weber's[5] or Strodtbeck's[6] thesis that Protestantism makes for more motivation and achievement over Catholicism; the one predisposes the individual to want to save himself, while the other predisposes the individual toward institutionalized salvation.

These reversals may be a refutation of the assumption that Catholic-Protestant differences in Iboland are comparable to Catholic-Protestant differences in Western countries. It would seem that religious affiliation per se is not the determining factor in either motivation or achievement. There must be some other background variables to account for the differences. It is possible that the observed superiority of Catholic girls over Protestant girls may be ascribable to a superiority of Catholic schools (before the recent state take-over of schools) rather than any more fundamental reason. The fact that religion failed to predict performance significantly for both boys and girls suggests this interpretation. If this superiority adduced as reason for the differences between the female groups was a fact, it would then obviously affect achievement, and might affect motivation also. This also ties up with our contention that the urban students achieve higher in school because of the superiority of urban over rural schools.

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[5]Weber, op. cit. [6]Strodtbeck, op. cit.

## Parents' Education, Motivation, and Achievement

There is a good deal of literature in support of the argument that the level of education of one's parents is influential to his motivation and academic performance in school. We were particularly interested in this in the light of a strong opinion expressed by Professor Onabamiro[7] that sons of the Nigerian elite are not making the grade as well as sons of less privileged persons. What do we find in our study?

The results show no difference in motivation as represented by the M-Scale total index between daughters and sons of educated and uneducated parents. However, a difference was found in two sub-components (Generalized Situational Choice Inventory and Preferred Job Characteristic Scale) for males but not for females. What this result indicates for the males is that the sons of educated parents have an edge over those of uneducated parents when the sub-components are considered singly, thus perhaps demonstrating a greater knowledge of the value of school and the kind of work the right type of education leads to. Beyond this, sons of the educated are found not to be superior to the sons of the uneducated in other characteristics that influence motivation.

To determine the real influence of parents' education, we needed to quantify its contribution to motivation, and we found that numerically its contribution to motivation was rather minimal. The result of analysis showed a weight of .4 percent for boys and .8 percent for girls, which were not statistically significant values.

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[7]Onabamiro, op. cit.

With respect to achievement, on the other hand, sons of educated parents had a mean performance difference of approximately four points over the sons of uneducated parents. This was a very important difference, and it achieved a 99 percent security. For the females, there was no difference between them. Therefore, the conclusion in this regard is that sons who come from educated parents do perform higher in school than sons of uneducated parents, while provenance from either educated or uneducated parents has no effect in the academic performance of their daughters.

It is to be observed here that the absence of a difference among males in motivation is in line with the finding which demonstrated that male heartlanders and fringers do not represent motivational extremes, and that male Catholics and Protestants were the same in their motivational characteristics. All these point up to our inability to find any significant difference among the Ibos.

In terms of achievement, we recorded a difference for males. The finding of superior performance for the sons of educated parents is in accordance with the traditional wisdom and expectations. This finding does not support Onabamiro's fears that suffocating affection has weakened the sons of the elite, thus enabling those from humble circumstances to surpass them in school performance. The absence of a difference among females on achievement is contrary to expectations and has no apparent explanation. In any event, we are constrained to ask if secondary school education is too low a cut-off point for the educated-uneducated dimension to work its influence. In Western countries, the point at which someone is regarded educated is the

first degree or equivalent. Perhaps, to make secondary education a cut-off point is too low and to include some uneducated parents as educated, especially since only one member of the family was required to have a secondary education. Usually, those who had this in the educated samples were the fathers. Since mothers usually have the greatest influence on their daughters in the family circle, it may well be that one reason parents' education, as we have defined it, did not have the expected result for girls is explained by our not determining which parent had the secondary education. Perhaps, a replication is in order, this time using as a cut-off point a diploma or a first degree, and specifying that both father and mother be educated or uneducated.

As a point of departure, it is germane to look at the results as a totality and to pose an important question that is suggested by these results. How is it that, in this study, the individual's background characteristics (religion, food area, education of parents, and location of schools) have generally not much relation to motivation and consequently achievement? This is a difficult question to answer in view of the fact that previous studies employing the same or similar variables found them influential both in motivation and in achievement. Could this situation result from wrong conceptions regarding these variables? Or, could it be because people react differently to their varying circumstances? In which case, what may be important in one situation may be unimportant in another. It may well be that these variables are not the crucial ones in the motivational reactions of Ibo youngsters. The pattern of these results where no

background variable is overwhelmingly influential would tend to lead to the suggestion that what may be accounting for the Ibo youth's motivation is a sort of an intrinsic urge rather than any extrinsic influence. Having said this, though, the dilemma still remains because we cannot, at the moment, account for the origin of this inner urge (if in fact it exists), which is apparently uninfluenced by extrinsic factors. Whether the finding is authentic or one of the mishaps attendant upon behavioral research is for future studies to illumine.

## Sex, Motivation, and Achievement

We consider here the influence of sex on achievement. Our finding was that the boys had a 3.42 mean difference advantage over girls in performance. That difference was highly significant. The finding is contrary to the findings in the United States, where females generally produce higher scores at the secondary school level than males. Why this difference, especially since we found a higher achievement motivation among girls than among boys? In the cultural circumstance in which the Ibo girl finds herself, it is not her intelligence, strictly speaking, that determines her going to school and staying in it. Other considerations may be more crucial. It follows that many intelligent girls may find themselves out of school. Conceivably, therefore, a greater number of boys of higher intelligence would be in school than girls, as it is now. The crucial test of this assertion would come with the proposed free and compulsory education, if extended to the secondary school level.

Examining the different findings for females and males on achievement and motivation, we discovered a seemingly confusing pattern.

The confusion may be brought about by cultural restrictions and requirements; or it may be due to the fact that our comparison between two different tests (male and female forms different) that tap, maybe, different characteristics might not be warranted. After all is said and done, one fact bolsters the finding on differences of achievement between the sexes, and that fact is that since more females attend rural schools where we find achievement lower, it would seem that we should find females lower achievers than males. This, in fact, is what has been found.

Finally, let us pull together what we learned from the sub-components of motivation. Briefly, we learned that

a. The Generalized Situational Choice Inventory was important in measuring the boys' achievement but not the girls';
b. The Preferred Job Characteristic Scale was not important for either sex;
c. The Word Rating List was barely significant for the boys but highly so for the girls;
d. The Human Trait Inventory was not important for boys, but barely so for girls.

This pattern reveals that the sub-scales have different roles within the samples of this study in predicting achievement by sex. This conclusion raises the question, why so? Motivation is a construct made up of many components (such as the sub-scales are trying to tap). Each individual or a group of individuals may possess some of the components. Since motivation depends on one's reactional or behavioral biography, what one gets in a test like this depends on antecedents. Boys and

girls are differently exposed in Nigeria to some of the antecedents that matter. It is understandable if this fact shows up in a battery such as the M-Scales. At various points in this discussion, we have suggested why the GSCI may be important to the boys, and the WRL to the girls. We went further to relate the factorial structure derived from the girls' responses to their personality and self-concept characteristics. All such points are equally relevant here. In sum, we submit that cultural patterning is at the root of these different reactions between the boys and the girls.

## Suggestions for Further Research

The above discussions on the data, the conclusions, and their limitations suggest the following line of future work:

1. Retesting the subsistence economy hypothesis with the aid of a better sampling technique.

2. A study using the M-Scales with samples, preferably inter-ethnic, definitely known to be different in motivation.

3. For the girls, personality considerations seem to be more important in motivation than other considerations. This would suggest factor analysis of the Word Rating List and the Human Trait Inventory to get an idea of the underlying factors.

4. The rural-urban differences in performance seem to exist because of differences in educational opportunities rather than any other fundamental reasons. But the East Central State Government, on realizing the fact of differential opportunity, gave a pledge for an equalization policy. Ten years may be a good enough time for the government equalization policy to have some effect. A replication of

urban-rural differences in performance at this time may reveal whether or not educational opportunities are indeed at stake.

5. A replication of the study redefining, as suggested, the educated-uneducated dimension for a better resolution of this matter.

6. Replication of the study using intelligence and aptitude measures along with motivation measures in predicting achievement, effort being made to delineate the relative contributions of each to school performance.

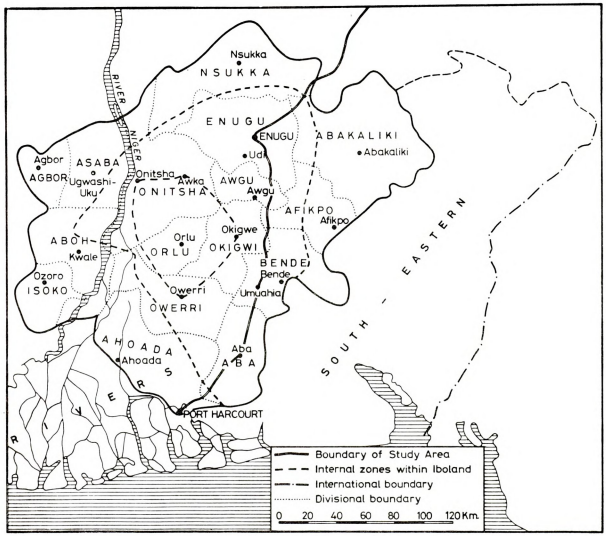
# APPENDICES

# APPENDIX A

## THE IBO TERRITORIAL MAP

APPENDIX A

THE IBO TERRITORIAL MAP



# APPENDIX B

B1--INTERCORRELATIONS AMONG VARIABLES

B2--MEANS AND STANDARD DEVIATIONS FOR VARIABLES--
MALES AND FEMALES

APPENDIX B1

INTERCORRELATIONS AMONG VARIABLES

Table B1.1.--Intercorrelations among variables.

| | R | FA | PE | WASC | LS | M-TOT | GSCI | PJCS | WRL | HTI |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MALES | | | | | |
| R | | 0.057 | 0.142 | -0.029 | -0.191 | 0.406 | 0.002 | 0.067 | 0.073 | -0.071 |
| FA | -0.192 | | 0.141 | -0.163 | 0.131 | 0.033 | 0.015 | 0.039 | 0.039 | -0.012 |
| PE | 0.073 | 0.138 | | -0.163 | 0.072 | 0.066 | 0.088 | 0.094 | 0.052 | -0.021 |
| WASC | 0.278 | 0.002 | 0.108 | | -0.361 | -0.298 | -0.257 | -0.236 | -0.239 | -0.177 |
| LS | -0.205 | 0.107 | -0.131 | -0.202 | | 0.044 | -0.061 | 0.028 | 0.044 | 0.109 |
| M-TOT | -0.232 | -0.072 | 0.055 | -0.450 | 0.036 | | 0.625 | 0.584 | 0.910 | 0.651 |
| GSCI | -0.023 | 0.029 | 0.096 | -0.287 | 0.047 | 0.518 | | 0.488 | 0.383 | 0.261 |
| PJCS | -0.110 | 0.061 | 0.085 | -0.310 | 0.103 | 0.744 | 0.392 | | 0.349 | 0.218 |
| WRL | -0.262 | -0.097 | 0.031 | -0.331 | 0.023 | 0.791 | 0.193 | 0.297 | | 0.477 |
| HTI | -0.110 | -0.190 | -0.050 | -0.310 | -0.129 | 0.560 | 0.254 | 0.283 | 0.265 | |
| | | | | | FEMALES | | | | | |

## APPENDIX B2

## MEANS AND STANDARD DEVIATIONS FOR VARIABLES--MALES AND FEMALES

Table B2.1.--Means and standard deviations for variables--males and females.

| Variables | Male | | Female | |
|---|---|---|---|---|
| | Mean | Standard Deviation | Mean | Standard Deviation |
| Religion | 0.47297 | 0.49995 | 0.47321 | 0.50152 |
| Food Area | 0.52973 | 0.49979 | 0.55357 | 0.49936 |
| Parent Education | 0.19730 | 0.39849 | 0.26786 | 0.44483 |
| WASC-S | 33.57837 | 9.43938 | 37.00000 | 7.29305 |
| Location of School | 0.44865 | 0.49803 | 0.04464 | 0.20745 |
| M-Total | 147.84053 | 19.28249 | 183.48213 | 20.05936 |
| GSCI | 40.75134 | 4.17929 | 34.63393 | 3.57667 |
| PJCS | 22.52432 | 3.82052 | 49.03571 | 8.80001 |
| WRL | 54.40810 | 12.28582 | 60.41071 | 11.42981 |
| HTI | 30.15675 | 4.68779 | 39.46428 | 4.81724 |

# APPENDIX C

## WEST AFRICAN SCHOOL CERTIFICATE RESULTS 1971

APPENDIX C

WEST AFRICAN SCHOOL CERTIFICATE RESULTS 1971

Table C.1.--West African school certificate results 1971.

| Name | Index Number 7112 | Eng. Lang. | Oral English | French | Igbo | Eng. Lit. | Bible Knowl. | History | Geography | Mathematics | Add Maths | Physics | Chemistry | Biology | Art | AGGREGATE | R E S U L T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 001 | 5 | 8 | | | | 3 | | 3 | 2 | | 3 | 3 | 2 | | 16 | 1 |
| | 002 | 7 | | | | | 2 | | 7 | 3 | 7 | 8 | 7 | 0 | | 33 | 3 |
| | 003 | 7 | | | | | 2 | | 5 | 3 | 6 | 7 | 3 | 3 | | 22 | 2 |
| | 004 | 7 | | 9 | | 8 | 5 | 6 | | 5 | | | 7 | 3 | | 33 | 2 |
| | 005 | 7 | | | | | | | | 6 | | | | | | 99 | G |
| | 006 | 3 | | | | | 6 | | 4 | 3 | 6 | 6 | 6 | 3 | | 26 | 2 |
| | 007 | 3 | | | 6 | 3 | 2 | 8 | | 3 | | 6 | 0 | 3 | | 20 | 1 |
| | 008 | 4 | 9 | 3 | | | 7 | | 9 | 3 | 8 | 7 | 8 | 7 | | 31 | 3 |
| | 009 | 3 | | | | | 1 | | 6 | 2 | 7 | 5 | 6 | 3 | | 20 | 1 |
| | 010 | 8 | | 9 | | | 5 | | | 3 | 7 | 6 | 6 | 6 | | 33 | 2 |
| | 011 | 7 | | | 6 | 4 | 3 | 7 | | 6 | | | 8 | 8 | | 33 | 2 |
| | 012 | 7 | | | | 8 | 7 | 9 | | 6 | | 9 | 8 | 8 | | 44 | 3 |
| | 013 | 6 | | | 8 | | 4 | | 6 | 6 | 9 | 5 | 5 | 2 | | 28 | 2 |
| | 014 | 4 | 8 | | 3 | | 2 | 8 | | 3 | | 6 | 3 | 2 | | 17 | 1 |
| | 015 | 3 | | | 3 | | 4 | | | 3 | | 7 | 6 | 4 | 7 | 23 | 1 |
| | 016 | 6 | | | 6 | 7 | 2 | 7 | | 3 | | | 7 | 6 | | 30 | 2 |
| | 017 | 5 | | | 8 | 8 | 5 | | 7 | 5 | | | 6 | 3 | | 31 | 2 |
| | 018 | 5 | 9 | | | 6 | | | 0 | 3 | 7 | 6 | 3 | 3 | | 27 | 2 |
| | 019 | 6 | | | 6 | | 3 | | | 2 | 4 | 4 | 3 | 3 | | 19 | 1 |
| | 020 | 7 | | | | | 3 | | | 3 | 7 | 5 | 3 | 6 | 6 | 26 | 2 |
| | 021 | 6 | | | 7 | | 2 | | 3 | 3 | | 7 | 2 | 1 | | 17 | 1 |
| | 022 | 5 | 9 | 0 | | | 3 | | | 3 | 7 | 4 | 3 | 2 | | 20 | 1 |
| | 023 | 9 | | | 9 | 8 | 3 | 8 | | 7 | | | 7 | 3 | | 36 | 3 |
| | 024 | 7 | 9 | | | 6 | 5 | 9 | 9 | 8 | | | 9 | 7 | | 42 | 3 |
| | 025 | 3 | | | 7 | 3 | 2 | 6 | | 8 | | | 6 | 4 | | 24 | 2 |
| | 026 | 3 | 8 | 4 | | | 1 | | | 1 | 1 | 2 | 1 | 1 | | 07 | A |
| | 027 | 8 | | | 8 | | 7 | | | 5 | 9 | 8 | 9 | 6 | | 42 | 3 |
| | 028 | 8 | | | 7 | | 3 | | 7 | 3 | | 6 | 5 | 5 | | 29 | 2 |
| | 029 | 3 | | | | 0 | 1 | | | 3 | 7 | 4 | 3 | 2 | 7 | 16 | 1 |
| | 030 | 6 | | | | 7 | 2 | | 8 | 4 | | 8 | 7 | 3 | | 29 | 2 |
| | 031 | 3 | | | 5 | 7 | 6 | 7 | 0 | 6 | | | 8 | 6 | | 33 | 2 |
| | 032 | 3 | | | | | 6 | 8 | | 3 | 5 | 7 | 8 | 4 | | 28 | 2 |
| | 033 | 4 | | 7 | | 7 | 6 | 6 | | 6 | | | 8 | 4 | | 33 | 2 |
| | 035 | 2 | | | | 6 | 7 | | 9 | 3 | 9 | 7 | 8 | 3 | | 28 | 2 |

Table C.1.--Continued.

| Name | Index Number 7112 | Eng. Lang. | Oral English | French | Igbo | Eng. Lit. | Bible Knowl. | History | Geography | Mathematics | Add Maths | Physics | Chemistry | Biology | Art | AGGREGATE | R E S U L T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 036 | 1 | | | | | 2 | | 5 | 2 | 4 | 4 | 2 | 3 | | 14 | 1 |
| | 037 | 2 | | 6 | | | 3 | | | 3 | 6 | 6 | 3 | 0 | | 23 | 1 |
| | 038 | 1 | 8 | | | | 5 | | 6 | 3 | 6 | 6 | 2 | 1 | | 18 | 1 |
| | 039 | 6 | | | 8 | | 3 | | | 3 | 7 | 7 | 3 | 3 | | 25 | 2 |
| | 040 | 3 | | 6 | | | 2 | | | 3 | | 6 | 3 | 3 | 6 | 20 | 1 |
| | 041 | 2 | 8 | | | 6 | 3 | 7 | | 3 | | 7 | 6 | 7 | | 27 | 2 |
| | 042 | 5 | | | 4 | | 3 | | | 2 | 3 | 6 | 3 | 2 | 7 | 17 | 1 |
| | 043 | 7 | | | 7 | 6 | 3 | 6 | | | | 8 | 6 | 6 | | 33 | 2 |
| | 044 | 3 | | | | | 2 | | | 3 | 6 | 4 | 3 | 3 | 7 | 18 | 1 |
| | 045 | 6 | 9 | | | 7 | 4 | | | 3 | 7 | 6 | 4 | 6 | | 29 | 2 |
| | 046 | 7 | 8 | | 6 | | 1 | | 7 | 5 | | 6 | 5 | 4 | | 27 | 2 |
| | 047 | 6 | | | 3 | | 2 | 6 | | 3 | | 8 | 3 | 6 | | 23 | 1 |
| | 048 | 3 | | | | 7 | 5 | 4 | | 6 | | 8 | 6 | 6 | | 30 | 2 |
| | 049 | 3 | 8 | | | 5 | 3 | 3 | | 2 | | 4 | 3 | 3 | | 17 | 1 |
| | 050 | 3 | | | | | 2 | | 3 | 1 | 3 | 4 | 3 | | 6 | 15 | 1 |
| | 051 | 5 | 8 | 7 | | | 8 | | | 3 | | 4 | 4 | 3 | 7 | 26 | 2 |
| | 052 | 5 | | | | | 3 | | 0 | 3 | 8 | 7 | 4 | 6 | | 28 | 2 |
| | 053 | 5 | | | 6 | 7 | 2 | 8 | | 6 | | | 6 | 6 | | 31 | 2 |
| | 054 | 7 | | | | 7 | 7 | 8 | 8 | 6 | | | 8 | 7 | | 42 | 3 |
| | 055 | 7 | | | 9 | 9 | 2 | 8 | | 5 | | | 9 | 9 | 9 | 40 | G |
| | 056 | 6 | | | | | 2 | | 3 | 2 | 6 | 4 | 3 | 4 | | 18 | 1 |
| | 057 | 5 | 8 | | | | 4 | | 7 | 3 | 7 | 6 | | 3 | | 27 | 2 |
| | 058 | 5 | 8 | | 7 | | 3 | | 6 | 4 | | 6 | 3 | 3 | | 24 | 2 |
| | 059 | 8 | | | | 7 | 1 | 4 | | 7 | | 8 | 4 | 6 | | 29 | 2 |
| | 060 | 3 | 8 | | | | 1 | | 0 | 2 | 3 | 3 | 3 | 1 | | 13 | 1 |
| | 061 | 2 | 8 | | 2 | | 1 | 5 | 0 | 3 | | 6 | 6 | 1 | | 14 | 1 |
| | 062 | 3 | | | 3 | 6 | 3 | | 6 | 6 | | 0 | 6 | 2 | | 23 | 1 |
| | 063 | 3 | 8 | | | | 1 | | 8 | 3 | 7 | 8 | 3 | 3 | | 19 | 1 |

Key: Paper Grade 1 = Excellent; 2 = Very Good; 3 = Good; 4), 5), 6) Credit; 7), 8) Pass; 9 = Fail

A = Grade 1 with Distinction

# APPENDIX D

## INFORMATION ON CLASS V STUDENTS

APPENDIX D

INFORMATION ON CLASS V STUDENTS

| Nos. | Name of Student | Male/ Female | Ethnic Group of Father | Ethnic Group of Mother | Home Division | Religion of Student | Principal's Rating of Student in Terms of "A," "B," "C," "D," and "F" |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |

# APPENDIX E

## ROUNDED INTERCORRELATION MATRIX FOR 45 ITEMS--GSCI IBO FEMALES

# APPENDIX E

## ROUNDED INTERCORRELATION MATRIX FOR 45 ITEMS--GSCI IBO FEMALES

Table E 1 --Rounded intercorrelation matrix for 45 items--GSCI Ibo females. (Values are as stated )

| Item No: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | .048 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | -.038 | .084 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | -.021 | .048 | .163 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | .123 | .072 | -.082 | -.046 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | .190 | .134 | .032 | .319 | -.082 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | .013 | -.020 | .023 | .120 | -.097 | -.054 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | .197 | .097 | -.133 | -.109 | -.032 | .157 | -.031 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | .046 | .099 | -.108 | .046 | .100 | -.047 | .097 | .133 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | -.030 | .085 | .122 | .167 | -.080 | .043 | .117 | -.033 | .031 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | .015 | -.051 | .154 | -.093 | -.039 | -.048 | -.103 | -.052 | 0.015 | .132 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | .077 | -.062 | .137 | .215 | .075 | -.035 | .080 | .021 | -.075 | .076 | -.045 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | .188 | .038 | -.083 | -.013 | .005 | .249 | -.154 | .113 | .046 | -.012 | -.047 | .003 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | .136 | -.179 | -.153 | .025 | -.076 | .064 | -.030 | .060 | .020 | .063 | -.022 | .026 | .067 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | .098 | -.041 | .048 | .098 | .105 | -.052 | .064 | -.136 | .000 | .002 | .121 | .105 | -.043 | .221 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | .208 | -.119 | .049 | .073 | .000 | .008 | -.062 | .087 | .000 | -.060 | .030 | .152 | .028 | .014 | -.019 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | -.052 | .097 | .091 | .103 | .042 | .012 | .063 | .014 | .035 | .137 | .020 | .103 | -.002 | .094 | .044 | -.090 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | -.033 | -.034 | -.059 | -.033 | .041 | -.019 | -.004 | .034 | -.041 | -.002 | -.072 | .089 | -.043 | .014 | .011 | -.007 | .434 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | -.021 | .048 | .163 | -.021 | -.046 | -.067 | .013 | .197 | .046 | .030 | .015 | .215 | -.013 | -.087 | -.114 | -.062 | -.052 | -.033 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | .073 | -.022 | .049 | .208 | .202 | -.043 | .168 | .006 | .067 | .018 | -.185 | .097 | -.052 | -.031 | .032 | .033 | .095 | .083 | .073 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | -.061 | .036 | .055 | .027 | .144 | -.035 | -.051 | -.103 | -.144 | -.036 | .130 | .163 | .079 | -.110 | .063 | .097 | .041 | -.003 | -.061 | .097 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | .038 | -.059 | .170 | -.038 | .118 | .108 | .023 | -.072 | .019 | -.052 | .154 | -.108 | .095 | -.022 | -.077 | .129 | -.001 | -.059 | -.038 | -.031 | .218 | 1.000 | | | | | | | | | | | | | | | | | | | | | |
| 23 | -.048 | .068 | .205 | .444 | -.104 | .158 | .149 | -.098 | .022 | .187 | .103 | .129 | -.761 | .020 | .169 | .055 | .032 | -.075 | .116 | .055 | .063 | .108 | 1.000 | | | | | | | | | | | | | | | | | | | | |
| 24 | .041 | .030 | .143 | .041 | .071 | .071 | .145 | -.002 | .048 | .019 | -.071 | .069 | .185 | -.091 | .020 | -.095 | -.025 | -.041 | .041 | .152 | .069 | .003 | .055 | 1.000 | | | | | | | | | | | | | | | | | | | |
| 25 | -.028 | -.096 | .107 | -.028 | -.060 | .088 | .128 | .017 | .060 | .064 | -.037 | .136 | .087 | .061 | -.038 | -.081 | .053 | .133 | .239 | .024 | -.079 | -.049 | -.063 | .269 | 1.000 | | | | | | | | | | | | | | | | | | |
| 26 | .044 | .069 | .077 | .141 | .111 | .002 | .100 | .018 | .133 | .111 | -.100 | .163 | .031 | .059 | -.007 | -.093 | .121 | .154 | -.054 | .140 | .045 | .020 | -.106 | .202 | .108 | 1.000 | | | | | | | | | | | | | | | | | |
| 27 | -.028 | -.001 | .264 | -.028 | -.060 | -.038 | -.039 | -.142 | -.072 | -.013 | .132 | .069 | -.070 | -.113 | .044 | .235 | -.068 | -.043 | -.029 | .024 | .136 | .107 | .065 | -.100 | -.036 | -.045 | 1.000 | | | | | | | | | | | | | | | | |
| 28 | -.160 | .097 | -.003 | -.160 | -.011 | -.026 | -.071 | -.069 | .048 | .015 | -.079 | .122 | -.010 | .040 | -.057 | -.058 | .079 | .119 | .077 | -.105 | .069 | -.073 | .002 | .112 | .008 | .171 | -.085 | 1.000 | | | | | | | | | | | | | | |
| 29 | .006 | -.117 | .010 | -.099 | .048 | -.114 | .092 | -.096 | .100 | .167 | .037 | .144 | -.031 | .047 | .152 | .087 | -.022 | -.014 | -.099 | -.039 | -.026 | -.114 | .030 | -.064 | -.047 | -.159 | -.047 | .064 | 1.000 | | | | | | | | | | | | | | |
| 30 | .121 | .143 | -.082 | -.046 | .239 | -.018 | -.097 | .120 | .015 | .165 | -.093 | .006 | .055 | -.131 | .000 | -.135 | .119 | .041 | -.046 | .000 | -.131 | -.082 | -.104 | .011 | -.060 | .062 | -.060 | -.011 | -.005 | 1.000 | | | | | | | | | | | | | |
| 31 | -.031 | .068 | -.054 | -.031 | .177 | -.005 | .095 | -.010 | .066 | .094 | -.056 | .087 | -.019 | .036 | -.012 | .007 | -.074 | -.049 | -.031 | .106 | .012 | .089 | .048 | .059 | -.040 | -.007 | .150 | -.059 | .084 | -.055 | 1.000 | | | | | | | | | | | | |
| 32 | .008 | .073 | .202 | .008 | -.158 | -.028 | .668 | -.117 | .000 | .120 | .147 | .023 | -.176 | .021 | .051 | -.032 | .094 | -.011 | .008 | .094 | .066 | .014 | .239 | .091 | .121 | .068 | .121 | -.017 | .070 | -.105 | .087 | 1.000 | | | | | | | | | | | | |
| 33 | .208 | -.022 | .049 | .208 | .067 | .263 | .073 | -.034 | .067 | -.060 | -.056 | -.013 | .028 | -.031 | -.094 | -.021 | -.028 | .083 | -.062 | -.021 | -.013 | .049 | .055 | .058 | -.081 | .101 | -.081 | .038 | -.206 | -.067 | .097 | .010 | 1.000 | | | | | | | | | | |
| 34 | .042 | .015 | .075 | .042 | -.091 | .064 | -.102 | .160 | .091 | -.094 | .009 | .013 | .100 | .111 | -.079 | -.022 | .019 | .066 | .042 | .050 | -.029 | .073 | .007 | -.039 | -.088 | .036 | -.088 | .039 | -.087 | .090 | .000 | -.092 | .050 | 1.000 | | | | | | | | | |
| 35 | .008 | .003 | .077 | .008 | .053 | .092 | .003 | .010 | -.211 | .028 | .080 | -.020 | .137 | .021 | -.015 | -.158 | .196 | -.011 | .114 | .010 | -.063 | .139 | .035 | .164 | .121 | .098 | -.127 | .093 | -.060 | .053 | .012 | .048 | -.074 | .079 | 1.000 | | | | | | | | |
| 36 | .069 | -.079 | .200 | .069 | -.006 | .101 | -.017 | .071 | .006 | .116 | .101 | -.518 | -.027 | -.041 | .269 | .130 | .207 | -.011 | .069 | -.026 | .141 | .043 | .112 | .047 | .124 | .080 | .228 | .138 | .112 | .060 | -.092 | -.003 | -.028 | -.017 | .079 | 1.000 | | | | | | | |
| 37 | .077 | -.013 | .055 | .077 | -.131 | -.035 | -.080 | -.103 | -.144 | -.004 | -.001 | -.061 | .003 | .116 | .148 | .097 | .103 | .089 | -.061 | -.067 | -.061 | .055 | .063 | -.074 | -.079 | -.034 | .029 | -.069 | .102 | .006 | -.087 | .023 | -.013 | .046 | .066 | .087 | 1.000 | | | | | | |
| 38 | -.050 | -.002 | .099 | .109 | .051 | -.037 | .130 | -.064 | .108 | .115 | .136 | .180 | -.081 | .058 | .129 | -.093 | .675 | .345 | -.050 | .044 | .051 | .005 | .118 | .097 | .059 | .102 | -.065 | .125 | .054 | .051 | .072 | .069 | -.020 | .013 | .118 | .161 | .116 | 1.000 | | | | | |
| 39 | -.130 | .148 | -.056 | -.032 | -.134 | .075 | -.016 | -.043 | -.111 | -.009 | .029 | -.129 | -.168 | -.138 | .110 | .193 | .087 | -.006 | -.032 | -.027 | .070 | -.056 | .039 | .046 | -.092 | .039 | -.092 | .023 | -.025 | -.016 | .025 | -.073 | -.066 | -.008 | .080 | .033 | -.010 | .018 | 1.000 | | | | |
| 40 | .048 | .068 | .012 | -.048 | -.022 | -.090 | -.057 | .050 | .022 | .064 | .051 | .063 | -.063 | .128 | .169 | -.075 | .256 | .252 | -.048 | -.013 | .129 | .205 | .050 | -.002 | .065 | .036 | -.063 | -.055 | .030 | -.022 | -.069 | -.067 | .010 | -.095 | -.016 | .176 | .129 | .271 | -.008 | 1.000 | | | |
| 41 | -.031 | .155 | .354 | .213 | .055 | .271 | .095 | .063 | -.055 | .028 | -.133 | -.087 | .019 | .036 | .084 | -.039 | .147 | -.048 | -.031 | .104 | .209 | .233 | .166 | .144 | -.040 | .132 | -.040 | -.059 | -.142 | -.066 | .130 | .012 | .104 | .060 | .087 | .098 | .110 | .042 | .166 | .156 | 1.000 | | | |
| 42 | -.031 | -.019 | .233 | -.031 | .055 | .179 | .016 | .010 | .666 | .028 | .099 | -.110 | .125 | -.044 | -.164 | .007 | -.036 | -.048 | -.031 | .007 | .110 | -.337 | -.069 | .144 | -.040 | .262 | .150 | .026 | -.142 | .055 | -.044 | .012 | .104 | .060 | .087 | .003 | .012 | .156 | -.186 | .048 | -.044 | 1.000 | | |
| 43 | -.043 | .068 | .302 | .444 | -.104 | .096 | .098 | -.098 | -.060 | .139 | -.001 | .129 | -.111 | -.038 | .169 | .055 | .107 | -.175 | .116 | .055 | .063 | .012 | .683 | .055 | -.063 | -.153 | .065 | .059 | .030 | -.104 | .048 | .137 | .120 | .007 | -.067 | .176 | .063 | .194 | -.008 | .050 | .166 | -.069 | 1.000 | | |
| 44 | .057 | .044 | -.068 | .057 | -.163 | .180 | -.019 | .162 | .091 | -.198 | -.071 | -.129 | .050 | .090 | -.038 | .053 | .008 | -.007 | -.087 | -.176 | -.070 | -.238 | -.079 | -.044 | -.150 | -.034 | -.150 | -.006 | -.090 | -.020 | -.225 | -.052 | .110 | .119 | -.141 | .165 | .104 | -.001 | .057 | -.079 | -.021 | -.021 | .060 | 1.000 | |
| 45 | .034 | .034 | .002 | .132 | .040 | .007 | -.148 | .024 | .205 | .078 | -.176 | .135 | .092 | .050 | -.082 | -.006 | .052 | .009 | -.065 | .150 | -.064 | .117 | .060 | .235 | .095 | .735 | -.058 | .141 | -.208 | .049 | .048 | .113 | .111 | .110 | .082 | .088 | .016 | .125 | -.051 | .060 | .118 | .188 | .060 | .103 | 1.000 |

# APPENDIX F

## QUARTIMAX ROTATION ANALYSIS FOR 53 ITEMS--GSCI IBO MALES

# APPENDIX F

# QUARTIMAX ROTATION ANALYSIS FOR 53 ITEMS--GSCI IBO MALES

Table F.1.--Quartimax rotation analysis for 53 items--GSCI Ibo males.

| | First Rotation | | | | | | Second Rotation | | | | | Third Rotation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FI | FII | FIII | FIV | FV | $h^2$ | FI | FII | FIII | FIV | $h^2$ | FI | FII | FIII | $h^2$ |
| 1 | .072 | -.071 | -.238 | -.053 | -.014 | .070 | .096 | -.039 | -.216 | -.053 | .060 | .095 | -.042 | -.200 | .051 |
| 2 | -.156 | .133 | -.173 | -.016 | -.047 | .075 | -.073 | .087 | -.208 | -.013 | .056 | -.073 | -.070 | -.214 | .056 |
| 3 | -.105 | -.073 | -.420 | -.039 | .005 | .195 | -.030 | -.069 | -.430 | -.044 | .192 | -.038 | -.082 | -.399 | .167 |
| 4 | .050 | -.301 | -.146 | -.110 | -.076 | .132 | .115 | -.275 | -.130 | -.126 | .122 | .120 | -.212 | -.065 | .064 |
| 5 | -.056 | .103 | .001 | .072 | -.661 | .456 | .371 | -.078 | -.061 | .065 | .152 | .352 | -.141 | -.071 | .149 |
| 6 | .449 | .138 | .076 | .171 | -.033 | .257 | .348 | .209 | .165 | .193 | .229 | .326 | .082 | .081 | .119 |
| 7 | .358 | .043 | .287 | .084 | .077 | .225 | .187 | .121 | .361 | .099 | .190 | .185 | .081 | .307 | .135 |
| 8 | .086 | -.148 | .030 | -.217 | -.273 | .152 | .243 | -.172 | .032 | -.227 | .141 | .270 | -.073 | .081 | .085 |
| 9 | .002 | -.325 | -.166 | -.230 | -.025 | .186 | .051 | -.288 | -.155 | -.247 | .171 | .074 | -.166 | -.068 | .038 |
| 10 | .150 | -.035 | -.255 | .075 | -.197 | .133 | .270 | -.038 | -.230 | .076 | .133 | .247 | -.117 | -.239 | .132 |
| 11 | -.200 | .105 | -.442 | .102 | .096 | .266 | .141 | .181 | -.383 | .119 | .214 | .115 | .055 | -.428 | .200 |
| 12 | -.085 | -.189 | -.080 | -.013 | -.227 | .101 | .095 | -.246 | -.108 | -.030 | .082 | .087 | -.225 | -.061 | .062 |
| 13 | -.075 | -.001 | -.196 | -.132 | -.311 | .158 | .166 | -.074 | -.229 | -.139 | .105 | .176 | -.044 | -.198 | .072 |
| 14 | .140 | .020 | .147 | .162 | .056 | .071 | .051 | .047 | .176 | .168 | .064 | .031 | -.020 | .138 | .021 |
| 15 | .190 | .015 | -.293 | -.121 | -.193 | .174 | .304 | .033 | -.259 | -.115 | .174 | .311 | .024 | -.257 | .163 |
| 16 | .017 | -.067 | -.245 | .064 | .035 | .070 | .022 | -.043 | -.231 | .063 | .060 | .003 | -.091 | -.226 | .060 |
| 17 | .072 | .145 | -.269 | -.114 | .006 | .112 | .081 | .174 | -.249 | -.102 | .109 | .094 | .166 | -.264 | .106 |
| 18 | .147 | -.083 | .156 | -.094 | -.226 | .113 | .240 | -.100 | .169 | -.098 | .106 | .254 | -.052 | .185 | .102 |
| 19 | .056 | -.296 | -.135 | .152 | .140 | .151 | -.022 | -.236 | -.104 | .140 | .086 | -.054 | -.279 | -.076 | .086 |
| 20 | .190 | -.434 | -.178 | .065 | .106 | .272 | .113 | -.336 | -.116 | .049 | .141 | .090 | -.342 | -.063 | .129 |
| 21 | .335 | -.213 | -.123 | -.081 | -.054 | .182 | .313 | -.126 | -.047 | -.081 | .123 | .316 | -.111 | -.026 | .113 |
| 22 | -.086 | -.489 | .064 | .131 | -.165 | .296 | .045 | -.531 | .042 | .097 | .295 | .014 | -.513 | .123 | .279 |
| 23 | .407 | .140 | -.004 | -.027 | -.067 | .191 | .350 | .211 | .075 | -.005 | .172 | .355 | .162 | .020 | .153 |
| 24 | .413 | .077 | -.147 | .174 | .119 | .242 | .253 | .190 | -.048 | .196 | .141 | .224 | .052 | -.119 | .067 |
| 25 | .376 | -.125 | -.105 | .029 | .021 | .169 | .290 | -.024 | -.018 | .036 | .086 | .280 | -.068 | -.031 | .034 |
| 26 | .015 | -.392 | -.044 | .231 | .043 | .211 | -.001 | -.368 | -.029 | .210 | .180 | -.046 | -.422 | .011 | .180 |
| 27 | -.003 | -.299 | -.018 | -.106 | -.023 | -.101 | .026 | -.280 | -.014 | -.123 | .094 | .035 | -.197 | .053 | -.043 |
| 28 | .347 | -.079 | .046 | -.030 | -.069 | .135 | .306 | -.011 | .116 | -.024 | .108 | .309 | -.018 | .104 | .107 |
| 29 | .423 | -.065 | -.036 | -.117 | -.105 | .210 | .398 | .019 | .050 | -.107 | .173 | .412 | .030 | .041 | .172 |
| 30 | .046 | -.057 | -.130 | .096 | -.354 | .157 | .276 | -.127 | -.142 | .089 | .120 | .250 | -.194 | -.139 | .120 |
| 31 | .065 | -.248 | -.105 | .136 | -.047 | .098 | .098 | -.234 | -.087 | .123 | .087 | .069 | -.280 | -.063 | .087 |
| 32 | .117 | -.003 | -.131 | .226 | -.578 | .416 | .468 | -.122 | -.145 | .220 | .303 | .420 | -.267 | -.169 | .276 |
| 33 | .167 | -.328 | -.073 | -.213 | -.250 | .249 | .308 | -.313 | -.046 | -.229 | .247 | .328 | -.210 | .029 | .153 |
| 34 | .168 | -.024 | -.125 | .110 | -.406 | .221 | .400 | -.082 | -.115 | .108 | .191 | .372 | -.172 | -.130 | .185 |
| 35 | -.030 | -.214 | .172 | -.037 | -.320 | .180 | .166 | -.290 | .143 | -.057 | .135 | .168 | -.234 | .192 | .120 |
| 36 | .351 | .088 | -.177 | .154 | -.090 | .194 | .342 | .140 | -.106 | .171 | .177 | .312 | .004 | -.167 | .125 |
| 37 | .055 | -.180 | -.395 | -.066 | -.119 | .210 | .172 | -.162 | -.378 | -.074 | .204 | .164 | -.165 | -.336 | .167 |
| 38 | .018 | -.539 | .106 | .169 | -.065 | .335 | .057 | -.535 | .113 | .136 | .321 | .022 | -.528 | .187 | .315 |
| 39 | .118 | .034 | -.080 | -.200 | -.234 | .116 | .250 | .021 | -.070 | -.197 | .107 | .275 | .074 | -.057 | .084 |
| 40 | .457 | -.139 | .091 | -.297 | -.129 | .341 | .428 | -.042 | .180 | -.291 | .302 | .471 | .067 | .202 | .268 |
| 41 | -.054 | -.097 | -.192 | .127 | -.169 | .094 | .091 | -.143 | -.209 | .118 | .086 | .061 | -.209 | -.197 | .086 |
| 42 | .268 | -.107 | -.228 | .054 | -.110 | .150 | .305 | -.058 | -.170 | .056 | .128 | .285 | -.124 | -.176 | .128 |
| 43 | -.061 | -.040 | -.257 | .126 | -.098 | .097 | .046 | -.071 | -.270 | .121 | .094 | .016 | -.148 | -.268 | .094 |
| 44 | .086 | -.234 | -.073 | .737 | -.128 | .627 | .152 | -.277 | -.059 | .723 | .626 | .030 | -.586 | -.110 | .356 |
| 45 | -.244 | -.299 | -.369 | .235 | -.095 | .350 | -.076 | -.358 | -.413 | .210 | .348 | -.130 | -.444 | -.361 | .344 |
| 46 | -.088 | .105 | -.354 | -.013 | -.004 | .144 | -.025 | .096 | -.366 | -.008 | .144 | -.032 | -.054 | -.371 | .142 |
| 47 | .088 | .014 | -.082 | .148 | -.663 | .476 | .494 | -.131 | -.110 | .141 | .293 | .459 | -.238 | -.124 | .283 |
| 48 | .022 | -.007 | .043 | -.146 | -.264 | .093 | .181 | -.057 | .028 | -.150 | .059 | .201 | .001 | .049 | .043 |
| 49 | .014 | .378 | -.135 | .034 | -.102 | .172 | .079 | .338 | -.144 | .055 | .144 | .076 | .253 | -.212 | .115 |
| 50 | .031 | -.056 | -.542 | .056 | -.031 | .302 | .110 | -.031 | -.522 | .056 | .289 | .083 | -.116 | -.515 | .285 |
| 51 | .276 | .096 | -.394 | -.137 | -.034 | .260 | .279 | .173 | -.329 | -.119 | .230 | .299 | .145 | -.348 | .226 |
| 52 | -.040 | -.484 | .027 | -.007 | -.094 | .245 | .041 | -.488 | .021 | -.038 | .241 | .032 | -.417 | .112 | .188 |
| 53 | .086 | -.098 | -.013 | .768 | -.158 | .633 | .160 | -.161 | -.005 | .761 | .631 | .037 | -.496 | -.085 | .254 |

# APPENDIX G

## QUARTIMAX ROTATION ANALYSIS FOR 45 ITEMS--GSCI IBO FEMALES

# APPENDIX G

## QUARTIMAX ROTATION ANALYSIS FOR 45 ITEMS--GSCI IBO FEMALES

Table G.1.--Quartimax rotation analysis for 45 items--GSCI Ibo females.

| | First Rotation | | | | | | | Second Rotation | | | | | | Third Rotation | | | | | Fourth Rotation | | | | Fifth Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FI | FII | FIII | FIV | FV | FVI | $h^2$ | FI | FII | FIII | FIV | FV | $h^2$ | FI | FII | FIII | FIV | $h^2$ | FI | FII | FII | $h^2$ | FI | FII | $h^2$ |
| 1 | .044 | .039 | .043 | -.150 | .126 | -.542 | .337 | .080 | .275 | .040 | .071 | -.011 | .089 | .021 | -.068 | .234 | .034 | .061 | .082 | .228 | .046 | .061 | .101 | .144 | .031 |
| 2 | -.020 | .035 | -.043 | -.311 | -.013 | .228 | .152 | -.050 | .253 | -.050 | -.071 | .033 | .075 | -.081 | .047 | .254 | -.034 | .074 | -.003 | .236 | -.008 | .056 | .011 | .183 | .034 |
| 3 | -.342 | .151 | -.024 | .041 | -.425 | -.073 | .328 | -.339 | -.051 | -.030 | .427 | .164 | .327 | -.401 | -.028 | -.166 | .353 | .314 | -.505 | .034 | .008 | .256 | -.497 | .004 | .247 |
| 4 | -.602 | .134 | -.057 | -.355 | .035 | -.154 | .534 | -.599 | .374 | -.070 | .021 | .111 | .517 | -.647 | .027 | .309 | .027 | .516 | -.517 | .410 | .136 | .454 | -.471 | .202 | .262 |
| 5 | .292 | .149 | -.063 | -.107 | -.229 | -.113 | .177 | .298 | .041 | -.062 | .251 | .141 | .177 | .224 | .060 | .017 | .282 | .133 | .119 | .063 | -.207 | .061 | .096 | .187 | .044 |
| 6 | -.166 | -.017 | .086 | -.623 | .045 | -.202 | .466 | -.177 | .647 | .070 | .025 | -.067 | .461 | -.277 | -.141 | .553 | -.071 | .408 | -.063 | .548 | .228 | .357 | -.001 | .261 | .068 |
| 7 | -.411 | .457 | .092 | .199 | .138 | .188 | .479 | -.403 | -.197 | .098 | -.190 | .432 | .279 | -.294 | .042 | -.023 | .247 | .150 | -.350 | .109 | -.046 | .137 | .346 | .100 | .130 |
| 8 | .203 | .053 | -.020 | -.199 | .244 | -.254 | .208 | .219 | .273 | -.020 | -.143 | .014 | .143 | .191 | .042 | .313 | -.066 | .140 | .269 | .232 | -.062 | .130 | .273 | .224 | .125 |
| 9 | .055 | .288 | .037 | -.092 | .163 | -.129 | .138 | .069 | .151 | .038 | -.108 | .267 | .112 | .072 | .038 | .248 | .151 | .091 | .083 | .264 | -.101 | .087 | .086 | .268 | .079 |
| 10 | -.247 | .172 | .172 | .069 | -.061 | .063 | .133 | -.244 | -.081 | -.172 | .036 | .187 | .132 | -.243 | .191 | -.067 | .136 | .118 | -.306 | .014 | -.157 | .118 | -.321 | .104 | .114 |
| 11 | -.071 | -.237 | -.079 | .142 | -.361 | .001 | .218 | -.076 | -.185 | -.081 | .339 | -.217 | .208 | -.123 | -.026 | -.340 | .023 | .132 | -.205 | -.284 | .044 | .125 | -.215 | -.250 | .109 |
| 12 | -.183 | .278 | -.283 | .281 | -.129 | -.456 | .495 | -.130 | -.174 | -.279 | .282 | .271 | .278 | -.178 | .280 | -.203 | .354 | .277 | -.359 | -.059 | -.329 | .240 | -.399 | .160 | .185 |
| 13 | .237 | .092 | .033 | -.246 | .016 | -.348 | .247 | .253 | .328 | .030 | .103 | .048 | .185 | .171 | -.044 | .301 | .113 | .135 | .210 | .288 | -.040 | .128 | .221 | .250 | .111 |
| 14 | -.050 | -.029 | -.202 | -.031 | .273 | -.248 | .181 | -.025 | .094 | -.201 | -.171 | -.052 | .082 | -.030 | .203 | .111 | -.166 | .082 | .019 | .043 | -.119 | .016 | .007 | .111 | .012 |
| 15 | -.289 | -.131 | -.270 | .181 | .009 | -.203 | .248 | -.264 | -.155 | -.270 | .063 | -.126 | .186 | -.273 | .212 | -.231 | -.103 | .183 | -.311 | -.211 | -.089 | .149 | -.332 | -.111 | .123 |
| 16 | -.100 | -.164 | .119 | .061 | -.165 | -.544 | .378 | -.064 | .033 | .115 | .348 | -.192 | .176 | -.127 | -.223 | -.126 | .058 | .085 | -.132 | -.062 | .214 | .067 | -.109 | -.191 | .048 |
| 17 | -.055 | .080 | -.778 | -.083 | -.003 | .128 | .688 | -.058 | .041 | -.779 | -.051 | .090 | .623 | -.140 | .765 | .024 | -.029 | .607 | -.226 | -.008 | -.646 | .469 | -.303 | .411 | .261 |
| 18 | .127 | .055 | -.561 | .031 | .123 | .049 | .352 | .134 | -.037 | -.557 | -.139 | .059 | .352 | .099 | .580 | .003 | -.068 | .350 | .024 | -.073 | -.527 | .284 | -.045 | .292 | .087 |
| 19 | -.072 | .193 | .080 | .156 | -.004 | -.039 | .075 | -.059 | -.129 | .084 | .021 | .199 | .067 | -.025 | -.033 | -.072 | .176 | .038 | -.088 | -.003 | -.024 | .008 | -.090 | .011 | .008 |
| 20 | -.097 | .356 | .005 | -.005 | -.062 | -.021 | .141 | -.090 | .029 | .005 | .066 | .356 | .140 | -.096 | .057 | .091 | .313 | .118 | -.161 | .199 | -.132 | .083 | -.163 | .231 | .080 |
| 21 | -.089 | -.071 | -.083 | -.066 | -.508 | .056 | .286 | -.107 | .008 | -.093 | .455 | -.056 | .231 | -.206 | -.015 | -.163 | .210 | .114 | -.289 | -.046 | -.006 | .085 | -.289 | -.040 | .085 |
| 22 | .063 | .005 | .020 | -.284 | -.660 | .015 | .521 | .035 | .229 | .007 | .610 | .005 | .426 | -.125 | -.132 | .024 | .364 | .166 | -.192 | .170 | .029 | .067 | -.176 | .103 | .042 |
| 23 | -.763 | .018 | -.031 | -.135 | -.116 | -.003 | .616 | -.768 | .106 | -.042 | .113 | .025 | .616 | -.780 | -.027 | .003 | .011 | .610 | -.707 | .148 | .221 | .571 | -.665 | -.058 | .445 |
| 24 | -.022 | .518 | .010 | -.089 | -.074 | .023 | .283 | -.019 | .115 | .010 | .061 | .514 | .281 | -.037 | .087 | .218 | .438 | .248 | -.114 | .345 | -.215 | .178 | -.118 | .397 | .172 |
| 25 | .044 | .428 | -.080 | .296 | .048 | -.033 | .232 | .069 | -.245 | -.070 | -.032 | .440 | .264 | .115 | .193 | -.098 | .338 | .175 | -.047 | -.014 | -.320 | .105 | -.086 | .198 | .047 |
| 26 | .154 | .665 | -.193 | -.204 | -.017 | -.026 | .545 | .161 | .252 | -.192 | .020 | .650 | .545 | .100 | .318 | .392 | .514 | .529 | .001 | .493 | -.484 | .477 | -.028 | .689 | .476 |
| 27 | -.125 | -.090 | .161 | .194 | -.497 | -.142 | .354 | -.119 | -.199 | .158 | .520 | -.074 | .354 | -.168 | -.256 | -.362 | .260 | .293 | -.285 | -.206 | .183 | .157 | -.273 | -.285 | .156 |
| 28 | .088 | .182 | -.208 | .030 | .073 | .093 | .105 | .092 | -.081 | -.203 | -.103 | .190 | .103 | .103 | .267 | .003 | .084 | .089 | .031 | -.005 | -.296 | .089 | -.006 | .192 | .037 |
| 29 | -.138 | -.175 | -.110 | .458 | .069 | -.093 | .285 | -.111 | -.439 | -.102 | -.028 | -.151 | .239 | -.042 | .092 | -.445 | -.140 | .228 | -.130 | -.456 | -.029 | .226 | -.161 | -.329 | .134 |
| 30 | .268 | .105 | -.160 | -.041 | .061 | -.036 | .115 | .273 | .063 | -.157 | -.048 | .095 | .114 | .245 | .192 | .109 | .056 | .112 | .207 | .064 | -.254 | .111 | .178 | .222 | .081 |
| 31 | -.034 | .147 | .203 | -.003 | -.160 | .167 | .118 | -.050 | -.030 | .203 | .094 | .161 | .079 | -.035 | -.174 | -.006 | .197 | .070 | -.063 | .075 | .100 | .020 | -.046 | -.012 | .002 |
| 32 | -.455 | .371 | .146 | .276 | -.033 | .173 | .473 | -.449 | -.287 | .151 | -.023 | .405 | .471 | -.351 | -.054 | -.176 | .289 | .241 | .441 | -.004 | .039 | .196 | -.432 | -.043 | .189 |
| 33 | -.078 | .106 | .083 | -.432 | .039 | -.163 | .244 | -.112 | .464 | .072 | .017 | .069 | .238 | -.179 | -.095 | .429 | .044 | .227 | -.047 | .450 | .121 | .220 | -.004 | .258 | .067 |
| 34 | .028 | -.023 | -.105 | -.300 | .045 | .009 | .105 | .016 | .290 | -.111 | -.050 | -.041 | .101 | -.038 | .086 | .263 | -.080 | .084 | .046 | .219 | -.039 | .052 | .054 | .192 | .040 |
| 35 | .091 | .191 | -.195 | -.098 | -.158 | .172 | .147 | .076 | .060 | -.196 | .084 | .199 | .095 | .028 | .217 | .074 | .197 | .092 | -.044 | .114 | -.269 | .088 | -.069 | .262 | .073 |
| 36 | -.175 | .090 | -.393 | .231 | -.296 | -.339 | .449 | -.140 | -.179 | -.392 | .395 | .093 | .370 | -.225 | .326 | -.296 | .271 | .318 | -.410 | -.166 | -.332 | .305 | -.456 | .079 | .215 |
| 37 | -.185 | -.207 | -.260 | -.061 | .036 | -.077 | .156 | -.182 | .052 | -.265 | -.009 | -.211 | .150 | -.216 | .191 | -.035 | -.212 | .130 | -.173 | -.074 | -.046 | .038 | -.182 | -.032 | .034 |
| 38 | -.137 | .143 | -.733 | -.005 | -.052 | .068 | .584 | -.132 | -.021 | -.733 | .018 | .156 | .580 | -.207 | .724 | -.039 | .063 | .573 | -.324 | -.023 | -.624 | .495 | -.399 | .382 | .305 |
| 39 | -.035 | -.112 | -.083 | -.093 | .050 | .554 | .338 | -.080 | -.035 | -.085 | -.242 | -.079 | .080 | -.034 | .105 | .011 | -.220 | .061 | .020 | -.061 | -.012 | .004 | .014 | -.038 | .002 |
| 40 | .013 | -.094 | -.549 | -.073 | -.161 | .038 | .343 | .007 | .033 | -.552 | .131 | -.088 | .331 | -.090 | .480 | -.066 | -.037 | .244 | -.160 | -.086 | -.399 | .192 | -.212 | .192 | .082 |
| 41 | -.221 | .075 | -.123 | -.487 | -.150 | .225 | .380 | -.258 | .412 | -.137 | .057 | .069 | .264 | -.342 | .092 | .346 | .040 | .247 | .244 | .392 | -.006 | .211 | -.219 | .289 | .131 |
| 42 | .187 | .245 | -.014 | -.255 | -.484 | -.160 | .415 | .182 | .261 | -.022 | .506 | .228 | .409 | .032 | -.028 | .152 | .488 | .263 | -.066 | .295 | -.147 | .113 | -.065 | .317 | .104 |
| 43 | -.768 | -.027 | -.093 | -.139 | -.066 | -.039 | .625 | -.769 | .116 | -.104 | .078 | -.022 | .622 | .785 | .027 | .006 | -.053 | .619 | .700 | .128 | .196 | .544 | -.662 | -.056 | .441 |
| 44 | -.036 | -.150 | .010 | -.338 | .475 | -.118 | .378 | -.035 | .375 | .005 | -.407 | -.189 | .343 | -.019 | -.001 | .416 | -.408 | .339 | .210 | .257 | .148 | .132 | .242 | .103 | .069 |
| 45 | .036 | .681 | -.103 | -.275 | .022 | -.084 | .559 | .045 | .337 | -.105 | .004 | .655 | .556 | -.012 | .227 | .471 | .505 | .529 | -.064 | .589 | -.369 | .487 | -.072 | .684 | .473 |

# APPENDIX H

## HIGHEST FACTOR LOADINGS FOR IBO MALES

APPENDIX H

HIGHEST FACTOR LOADINGS FOR IBO MALES

Table H.1.--Highest factor loadings for Ibo males.

| Variables | Factor I | Factor II | Factor III | Factor IV | Factor V |
|---|---|---|---|---|---|
| (3) | | | -.420 | | |
| (6) | +.449 | | | | |
| (11) | | | -.442 | | |
| (20) | | -.434 | | | |
| (22) | | -.489 | | | |
| (23) | +.407 | | | | |
| (24) | +.413 | | | | |
| (32) | | | | | -.578 |
| (34) | | | | | -.406 |
| (37) | | | -.395 | | |
| (38) | | -.539 | | | |
| (40) | +.457 | | | | |
| (44)(53) | | | | same | |
| (47) | | | | | -.663 |
| (50) | | | -.542 | | |
| (52) | | -.484 | | | |
| (53)(44) | | | | +.768 | |

# APPENDIX I

## HIGHEST FACTOR LOADINGS FOR IBO FEMALES

APPENDIX I

HIGHEST FACTOR LOADINGS FOR IBO FEMALES

Table I.1.--Highest factor loadings for Ibo females.

| Variables | Factor I | Factor II | Factor III | Factor IV | Factor V | Factor VI |
|---|---|---|---|---|---|---|
| (1) | | | | | | -.542 |
| (3) | | | | | -.425 | |
| (4) | -.602 | | | | | |
| (6) | | | | -.623 | | |
| (7) | -.455 | | | | | |
| (12) | | | | | | -.456 |
| (16) | | | | | | -.544 |
| (17) | | | -.778 | | | |
| (18) | | | -.561 | | | |
| (21) | | | | | -.508 | |
| (22) | | | | | -.660 | |
| (23) | -.768 | | | | | |
| (24) | | +.518 | | | | |
| (25) | | +.428 | | | | |
| (27) | | | | | -.497 | |
| (29) | | | | +.458 | | |
| (33) | | | | -.432 | | |
| (39) | | | | | | +.554 |
| (40) | | | -.549 | | | |
| (41) | | | | -.487 | | |
| (44) | | | | | +.475 | |
| (45) | | +.681 | | | | |

# APPENDIX J

## RELIABILITY ESTIMATE THROUGH HOYT'S ANALYSIS OF VARIANCE

# APPENDIX J

## RELIABILITY ESTIMATE THROUGH HOYT'S ANALYSIS OF VARIANCE

Table J.1.--Reliability estimates using Hoyt's analysis of variance technique.

| | Items | | | | | | |
|---|---|---|---|---|---|---|---|
| Student | 1 | 2 | 3 | 4 | ... | n | Scores |
| 1 | | | | | | | $t_1$ |
| 2 | | | | | | | $t_2$ |
| 3 | | | | | | | $t_3$ |
| 4 | | | | | | | $t_4$ |
| . | | | | | | | . |
| . | | | | | | | . |
| . | | | | | | | . |
| k | | | | | | | $t_k$ |
| Totals | $P_1$ | $P_2$ | $P_3$ | $P_4$ | ... | $P_n$ | $\sum_{i=1}^{n} p_i = \sum_{i=1}^{k} t_i$ |

$$\frac{1}{n}\sum_{i=1}^{k} t_{2_i} - \frac{\left(\sum_{i=1}^{k} t_i\right)^2}{nk} = \text{sum of squares among students}$$

$$\frac{1}{k}\sum_{i=1}^{n} p_{2_i} - \frac{\left(\sum_{i=1}^{n} t_i\right)^2}{nk} = \text{sum of squares among items}$$

$$\frac{\left(\sum_{i=1}^{k} t_i\right)\left(nk - \sum_{i=1}^{k} t_i\right)}{nk} = \text{Total sum of squares}$$

Let $n_1$ = correct responses; and $n_2$ = incorrect responses;

Then mean = $\frac{n_1(1) + n_2(0)}{n_1 + n_2} = \frac{n_1}{n_1+n_2}$

Sum of squares of deviations from the mean = $\frac{n_1 n_2}{n_1+n_2}$

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$$r_{tt} = \frac{\text{Variance among students - remainder Variance}}{\text{Variance among students}}$$

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