An Item Response Theory Analysis of the Academic Amotivation Inventory for Secondary School Students in Southwestern Nigeria

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Abstract: *This study conducted an Item Response Theory Analysis of Academic Amotivation Inventory (AAI) using a Graded Response Model, which is a unidimensional IRT analysis, on AAI and on each of its subscales. It determined the item and category difficulty of AAI and investigated the discrimination properties of its individual item on a sample of 1000 secondary school students in Southwestern Nigeria. The results revealed that all the items had high location parameters indicating that few examinees endorsed positive functioning on the scale and all the items had slope parameters (α) greater than 1.0 indicating that all the items were able to discriminate between individuals with varying levels of the AAI and its sub-scales traits. AAI continues to have strong psychometric properties and is a sound measure of academic amotivation.*
Keywords: *Academic Amotivation, Classical Test Theory, Item Response Theory, Scale, Secondary School Students,*

I.   Introduction

Scale or inventory is an instrument used to investigate people's attitude, interest, opinion skill, knowledge and ability. It is the conversion of covert attributes into readable and interpretable form or numerical values. It is a collection of statements, which when added or summed together measure some hidden or underlying (often called covert) traits. It generally consists of questions or statements and a set of response categories related to a score and place respondents on a continuum from a very low or negative to a very high or positive position [1].

Studies on scale development over the years have been carried out using Classical Test Theory (CTT) principles, despite the compelling arguments made by some measurement theorists suggesting that CTT techniques make a number of erroneous assumptions. Many measurement theorists in their recommendation for changes to current measurement approaches, stated that Classical Test Theory (CTT) and Item Response Theory (IRT) approaches should be integrated in a comprehensive approach to measurement issues, arguing that IRT techniques overcome many of CTT's deficiencies and lead to more valid and reliable results [2]. Unlike in CTT, the primary interest in IRT is whether a test taker got each individual item correctly or not, rather than the sum of the raw test scores. This is because the basic concepts of IRT rest upon the individual items of a test rather than upon some aggregate of the items responses. The IRT is gaining acceptance in psychological and educational testing because it provides more adaptable and effective methods of test construction, analysis and scoring than those derived from CTT. IRT would provide information on the function of individual test items, the scale's ability to measure the latent trait it is employed to measure, and increase the understanding of the traits. Its models provide a statistically-rich class of tools for analysis of educational test and psychological scale data. In the Classical Test Theory (CTT), the total test score in terms of number of correct responses to the items has a central role both for item analysis and for examinee's evaluation. One of the main drawbacks of CTT is that the evaluation of examinee performance is strongly influenced by the sample analyzed. In order to overcome this weakness, IRT has been developed in the latent variable model framework. It was first formalized in the work of [3] to allow the evaluation of both student ability and item properties, such as item difficulty and discrimination capability. These properties do not depend on the sample considered. In fact, both item and ability estimates are said to be unchanging. Since ability is not directly observable and measurable, it is referred to as a latent trait and IRT models specify the relationship between the observable examinees performance and the unobservable latent ability, which is assumed to underlie the test results. The aim of this study is to examine the item analysis of a scale using IRT procedures. The principal measure of interest, L'Inventaire de Motivation Acade´mique i.e., the Academic Amotivation Inventory (AAI) which was adapted for this study comprises four subscales (four items per subscale) devised to establish the four proposed dimensions of academic amotivation [4] ascertains students' reasons for not wanting to study or do their homework.

Motivation as a concept is a theoretical construct used to explain the initiation, direction, intensity, and persistence of behaviour, especially goal-directed behaviour. It is derived from a Latin word "Emovere" which implies to "move" and therefore be literally translated to mean "the arousal of movement in any organism. It involves the process that energizes, direct, and sustains behaviour. "To be motivated according to [5] means to be stimulated to do something" while excitement, interest, and enthusiasm towards learning is the primary components of motivation [6]. Although, two types of motivation have been mentioned over the years - intrinsic and extrinsic motivation - however, the Self Determination Theory (SDT) posits that motivation within a social setting can be classified as intrinsic, extrinsic, and amotivation which is the third type of motivation.

Intrinsic Motivation: This type of motivation is referred to as internal or internally generated drive to achieve a set goal(s) or objective(s). Intrinsic motivation originates from rewards inherent in the tasks i.e. intrinsically motivated individuals enjoy learning because of the nature of the task itself. When a person is intrinsically motivated, the source of motive is not usually traced to external factors, but at instances where they are originated from external factors, it takes the internal motive to sustain them or else they die off at the external level. Previous researchers have found that individuals, who are more intrinsically motivated, do not only employ deeper-level processing strategies but perform better academically. They also have better psychological well-being and derive more satisfaction out of a number of life's activities [5] [7].

Extrinsic Motivation: The extrinsic motivation unlike the intrinsic type of motivation, stirs up an individual to do something for a tangible reward. Previous researchers have noticed that as student's move from the early elementary school to the high school, their intrinsic motivation decreases [8]. One of these researchers detects that, as students move higher in class, school get boring and uninteresting. This suggests that there could be changes or shift from the intrinsic motivation to the extrinsic. Here the attention is shifted to what a person is able to gain in reward for an effort put into an activity.

Amotivation: Despite the fact that researchers have argued within the confines of intrinsic and extrinsic motivation for decades, recent works have extended search for a type of motivation in students which may be an explanation beyond whether students were intrinsically or extrinsically motivated in schools. The concept of amotivation (an absence of motivation) is grounded in Self-Determination Theory (SDT) [9]. It is the lack of desire to engage in or participate within a specific setting. SDT postulates that amotivation is the most distressing form of motivation, due to various negative mental, physical and affective outcomes. For instance, a student may perceive physical education as meaningless and may exhibit avoidance behaviors, such as making excuses not to participate in class [10]. Facilitation of amotivation occurs through the lack of attainment within a social context of three psychological needs; relatedness, competence and autonomy. Relatedness is defined as having a connection with peers who are deemed significant to the student. Instances where students do not have relational connections with peers, there is likelihood that it generate into amotivation. This may automatically make the child alienated from class and class activities; thereby resulting in boredom and making learning uninteresting to the students. Competence is the perception and experiencing of effectiveness within a specific setting. An absence of motivation resulting from the perceived incompetency of students, for instance, a student who feels he/she is not capable of solving a mathematical problem may overtime lose motivation thereby resulting in amotivation. A child can also become amotivated through autonomy which is the perception of volition over one's own behavior [9][11].

It is a fact that students may lack motivation in school for many different reasons and it has been suggested that amotivation is a structurally complex phenomenon that can be conceptualized as a multifaceted construct [12]. The lack of motivation toward environmentally proactive behavior was examined by [13]. These authors proposed that environmental amotivation occurs for four different classes of reasons: strategy beliefs, ability beliefs, effort beliefs, and helplessness beliefs. That is, individuals may experience an absence of motivation to perform environmentally friendly behaviors because of the belief that ecological behaviors (e.g., recycling) are ineffective in producing the desired outcome, the belief that they do not have the personal ability to enact the required task, the belief that they cannot maintain the effort that is required by the behavior, or, finally, the belief that they are simply powerless in effectuating a suitable outcome. Support for these four dimensions of environmental amotivation has been established by exploratory factor analyses and confirmatory factor analyses [13].

The works of [4] was built on [13]. Two of the four dimensions, as they were relevant in the academic domain were retained and two additional variables that carry specific relevance for academic behavior had been developed and tested for the intentions of their investigation. Thus, the four subtypes of academic amotivation proposed were based on ability beliefs, effort beliefs, characteristics of the task, and value placed on the task.

Ability Beliefs as a dimension of amotivation was directly adapted from [13]. The concept borrows from [14] notion of self-efficacy expectancy and [15] theory that people hold expectations about their ability to apply appropriate strategies in order to execute a task. When perceived self-efficacy is high, more ambitious challenges are pursued, and a greater goal commitment is applied [16].

The second dimension; effort beliefs depict the student's desire and capacity to invest the energy or effort demanded by a given behavior. Students may be aware of what is required to fulfill academic requirements. They may also positively appraise their ability to do so. Nonetheless, they may still be academically unmotivated. This may be due to the fact that they do not believe they can initiate or maintain the effort that is required by academic tasks.

The third dimension described amotivation in terms of the individual's values in relation to the task at hand i.e value of task at hand. It has been noted that the consideration of values permits the prediction of behavior [17]. Moreover, [18] noted that amotivation stems from not valuing an activity. In fact, recent key articles include a lack of value as part of the definition of amotivation [5]. When the task is not an integral component of a student's life, or if, in effect, it is not important to the student, amotivation may result.

The last dimension was characteristics of the task; it denotes the specific features of the academic task that may lead to amotivation. Research reveals that people must experience some form of pleasure or interest in order to effectuate behavior [19]. If the qualitative experience of the activity does not engage the knowledge or ability or stimulation of students, then it is unlikely students will favor it. When a task is void of interesting or stimulating qualities and when it is boring, routine, tedious, arduous, or irrelevant, amotivation may ensue. Such an activity is likely to be abandoned or neglected. Thus, the unappealing characteristics of the academic task may indeed lead to academic disengagement.

II.   Statement of the Problem

It has been argued that a better understanding of the reasons why students lack academic motivation is a contemporary issue of critical importance [20]. A deeper understanding of academic amotivation may prove very useful in comprehending and preventing dropout and mass failure of secondary school students. As a result, there is a need for a sound, comprehensive measure of academic amotivation that can assess many of the academic amotivation factors.

Academic Amotivation Inventory (AAI) is a newly designed 16-item survey that is based on notable theories of Self Determination Theory (SDT) and empirical evidence [6]. Research on the AAI has already demonstrated sound psychometric properties in its early stages of development [6]. There is a need to adapt and further validate AAI to suit southwestern Nigeria secondary school students using a Graded Response Model, which is a unidimensional IRT analysis, on each of the AAI subscales. Thereby, an Item Response Theory (IRT) analysis would help to refine the inventory and strengthen its psychometric properties. In addition, it will also provide a more detailed understanding of academic amotivation.

III.   Objectives of the Study

In the consideration of the title of this study, the specific objectives are to
a.   determine the item and category difficulty of AAI and
b.   investigate the discrimination properties of individual item.

IV.   Research Questions

1.   What is the level of item difficulty and category difficulty of AAI?
2.   What are the discriminating properties of individual items of AAI?

V.   Method

The study adopted the survey research design. In a survey research design, information is gathered about the characteristics of populations studied in a smaller group (a sample) carefully drawn from the population and the findings from the sample is used to make inferences about the population. The population of the study comprised secondary schools students in Southwestern Nigeria. The sample was selected using multi-stage sampling technique. Three states were selected out of six states (Lagos, Ogun, Oyo, Osun, Ondo and Ekiti) in Southwestern Nigeria using simple random sampling technique. One Local Government Area (LGA) from each of the three senatorial districts in each of the three States was selected using simple random sampling technique. Two secondary schools from each of the LGAs and two intact SS III classes from each of the secondary schools were selected for the study. A sample of 1000 students who adequately completed the instrument was selected. An instrument titled Academic Amotivation Inventory (AAI) was adapted and administered. The data collected were analyzed using SPSS and IRTPRO softwares.

VI.   Instrument

The principal measure of interest, L'Inventaire de Motivation Acade´mique i.e., the Academic Amotivation Inventory (AAI) was adapted for this study. AAI comprises four subscales (four items per subscale) devised to establish the four proposed dimensions of academic amotivation: deficits in ability beliefs (e.g., "Because I don't have what it takes to do well in school"), deficits in effort beliefs (e.g., "Because I don't

have the energy to study"), lack of academic values (e.g., "Because studying is not important to me"), and unappealing characteristics of academic tasks (e.g., "Because I find it boring") [6] ascertains students' reasons for not wanting to study or do their homework.

Students were asked to rate, from 1 to 7 on a Likert-type scale, the degree to which each statement corresponded with their reasons for not wanting to study or do school work (1 _ *does not correspond at all*, 4 _ *corresponds moderately*, 7 _ *corresponds exactly*). The internal consistency (coefficient alpha) of the subscale scores for the final version of the AAI was found to be very satisfactory (i.e., .84 < a < .86 in Study 2 and .81 < a < .86 in Study 3).

The change made to the adapted version of this scale was in the response format, instead of a 7 – point Likert response format, a 5 – point Likert response format was used (1 – corresponds not at all, 3 – corresponds moderately, 5 – corresponds exactly).

VII.   Analyses

Item Response Theory was used to investigate the research questions for this study. Preliminary analysis was first conducted to establish evidence of reliability coefficients of AAI and its sub-scales. Descriptive information was provided on the AAI describing the frequency of each item response option as well as the mean, maximum, minimum, and standard deviation of each item.

Next, a unidimensional IRT method was used to investigate the psychometric properties of the scale and its subscales items. The item difficulty/endorsement was examined as well as the items' spread/category thresholds. The Graded Response Model (GRM), which is a suitable for analyzing polytomous Likert style item responses, was employed. This analysis was parameterized to provide overall item difficulty/endorsement and item step difficulties/category thresholds. With this parameterization, the model was estimated by IRTPRO software. As a review from [21], the location parameter represented by Lambda value (λi) is the score that is used to evaluate the endorsement/difficulty level of an item and represents the placement of the item on the latent trait continuum. Items with location parameters near 0 indicate that the item is placed on the middle of the trait scale and has appropriate endorsement. As described by [21], items with location parameters above 0.3 are high and items with location parameters below 0.3 are low. Thus, individuals who possess a high amount of a trait tend to provide answers of positive functioning and individuals who possess a low amount of a trait tend to provide answers of negative functioning. Item with high location parameter suggest it is more difficult for examinees to endorse positive functioning and few examinees scored with a response option indicating positive functioning. Item with low location parameter suggest that it is less difficult and examinees were more likely to endorse positive functioning or many examinees scored with a response option indicating positive functioning.

The discriminating properties of each item were evaluated. Item discrimination was investigated to evaluate whether each item can detect varying levels of the subscale trait. Each item's slope (*a*) parameter was analyzed (*i = 16*). Items with slope parameter values below 1.0 were considered less discriminatory (the slope is flatter) than those with the slope parameter higher than 1.0. This study employs this 1.0 criterion as a rule of thumb to investigate item discriminations to identify "less discriminating" items [21]. The slope of an item is used to determine an item's ability to discriminate between individuals possessing varying levels of the scale or its subscales traits [21] [22]. Slopes above 1.0 indicate that the item is sensitive enough to detect differences in test takers' levels of the trait being measured by the scale or its subscales. Therefore, the higher the alpha level the better the item is to detect differences in the scale or its subscales traits [21].

VIII.   Results

Preliminary Analysis

Reliability of the scale and its sub-scales were calculated using Cronbach's Alpha, Spearman Brown and Guttman Split-half methods. The reliability coefficients of AAI and its sub-scales are presented in Tables 1 and 2.

Table 1: The Reliability Coefficients of AAI

Reliability Types	Coefficients
Cronbach's Alpha	0.953
Spearman-Brown	0.905
Guttman Split-half	0.905

The results from Table 1 showed that the reliability coefficients of AAI were consistently high.

Table 2: The Reliability Coefficients of AAI's Sub-scales

Subscales	Cronbach's Alpha	Spearman-Brown	Guttman Split-half
Value of Task	0.895	0.883	0.820
Ability Beliefs	0.863	0.852	0.851
Task Characteristics	0.858	0.830	0.830
Effort Beliefs	0.866	0.879	0.877

The results from Table 2 showed that the reliability coefficients of AAI's sub-scale were consistently high.

Descriptive statistics for AAI
The mean, the standard deviation, minimum, maximum scores and the frequency of the response options for AAI's items are displayed in Table 3.

Table 3: Descriptive Statistics for AAI

	Statistical Properties					Frequency of Response Options				
	M	SD	Min	Max	Missing	1	2	3	4	5
Item 1	1.54	1.27	1	5	09	861	31	27	18	99
Item 2	1.41	1.10	1	5	03	859	21	21	38	58
Item 3	1.42	1.13	1	5	10	851	24	26	18	71
Item 4	1.40	1.09	1	5	05	859	28	19	28	61
Item 5	1.48	1.11	1	5	06	797	66	40	32	59
Item 6	1.45	1.09	1	5	04	819	52	37	31	57
Item 7	1.54	1.15	1	5	11	759	91	43	30	66
Item 8	1.72	1.28	1	5	07	688	115	56	48	86
Item 9	1.58	1.18	1	5	11	744	91	45	42	67
Item 10	1.49	1.12	1	5	12	789	62	41	40	56
Item 11	1.69	1.26	1	5	08	701	101	60	53	77
Item 12	1.60	1.17	1	5	18	722	98	55	48	59
Item 13	1.65	1.17	1	5	12	687	128	59	60	54
Item 14	1.63	1.21	1	5	12	713	113	45	45	72
Item 15	1.61	1.17	1	5	15	722	97	57	50	59
Item 16	1.46	1.09	1	5	06	799	74	34	31	56

Research Question 1: What are the levels of items and category difficulty of AAI?
The levels of items and category difficulty of AAI and its subscales are presented in the Tables 4 – 8 below.

Table 4: Overall Item Endorsement and Category Thresholds of AAI

Item	λ	β1	β2	β3	β4
1	1.35	1.13	1.28	1.43	1.54
2	1.43	1.22	1.34	1.45	1.70
3	1.39	1.19	1.32	1.46	1.57
4	1.43	1.19	1.36	1.47	1.68
5	1.35	0.95	1.25	1.48	1.71
6	1.35	1.00	1.24	1.47	1.67
7	1.22	0.83	1.20	1.42	1.61
8	1.24	0.65	1.14	1.42	1.74
9	1.23	0.78	1.13	1.39	1.63
10	1.32	0.92	1.20	1.41	1.74
11	1.22	0.66	1.08	1.40	1.75
12	1.28	0.74	1.13	1.45	1.78
13	1.28	0.64	1.13	1.43	1.90
14	1.24	0.68	1.16	1.42	1.69
15	1.29	0.76	1.18	1.43	1.79
16	1.41	0.97	1.32	1.55	1.78

In the present study, high scores do not represent agreement with item statements, but represent positive academic amotivation functioning. The results from Table 4 showed that all the items of AAI had high location parameters indicating that few examinees endorsed positive functioning. These scores suggest that examinees for example in item10 were less likely to indicate that they don't like studying.

Table 5: Overall Item Endorsement and Category Thresholds of Value of Task Sub-scale

Item	λ	β1	β2	β3	β4
1	1.27	1.06	1.21	1.35	1.46
2	1.41	1.20	1.31	1.44	1.67
3	1.35	1.16	1.28	1.43	1.53
4	1.43	1.20	1.36	1.48	1.67

The results from Table 5 showed that all the items of Value of Task Sub-scale had high location parameters indicating that few examinees endorsed positive functioning. These scores suggest that examinees for example in item 2 were less likely to indicate that studying is not valuable to them.

Table 6: Overall Item Endorsement and Category Thresholds of Ability Beliefs Sub-scale

Item	λ	β1	β2	β3	β4
5	1.34	0.94	1.24	1.48	1.70
6	1.32	0.98	1.22	1.43	1.65
7	1.27	0.81	1.18	1.42	1.61
8	1.25	0.65	1.15	1.45	1.76

The results from Table 6 showed that all the items of Ability Beliefs Sub-scale had high location parameters indicating that few examinees endorsed positive functioning. These scores suggest that examinees for example in item 5 were less likely to endorse that they don't have what it takes to do well in school.

Table 7: Overall Item Endorsement and Category Thresholds of Task Characteristics Sub-scale

Item	λ	β1	β2	β3	β4
9	1.19	0.73	1.09	1.33	1.61
10	1.30	0.91	1.18	1.39	1.70
11	1.20	0.65	1.06	1.37	1.72
12	1.30	0.75	1.16	1.49	1.81

The results from Table 7 showed that all the items of Task Characteristic Sub-scale had high location parameters indicating that few examinees endorsed positive functioning. These scores suggest that examinees for example in item 9 were less likely to endorse that they find studying boring.

Table 8: Overall Item Endorsement and Category Thresholds of Effort Beliefs Sub-scale

Item	λ	β1	β2	β3	β4
13	1.25	0.59	1.09	1.42	1.90
14	1.13	0.62	1.05	1.29	1.57
15	1.26	0.73	1.14	1.41	1.75
16	1.43	0.99	1.34	1.57	1.81

The results from Table 8 showed that all the items of Effort Beliefs Sub-scale had high location parameters indicating that few examinees endorsed positive functioning. These scores suggest that examinees for example in item 13 were less likely to endorse that they were a bit lazy.

Research Question 2: What are the discriminating properties of each AAI's item
The discriminating properties of each AAI's item and its sub-scales' items are presented in the Tables 9 - 13.

Table 9: Slope Index of AAI

Item	α	s.e.
1	2.63	0.24
2	4.38	0.45
3	4.35	0.46
4	4.52	0.48
5	3.60	0.34
6	4.56	0.45
7	3.75	0.34
8	2.29	0.19
9	3.43	0.30
10	3.55	0.34
11	2.70	0.23
12	2.84	0.25
13	2.52	0.21
14	3.04	0.26
15	3.04	0.27
16	3.33	0.34

The results from Table 9 showed that all the items on AAI have slope parameters (α) greater than 1.0 indicating that all the items were able to discriminate between individuals with varying levels of the AAI trait.

Table 10: Slope Index of Value of Task Sub-scale

Item	α	s.e.
1	3.39	0.33
2	5.84	0.86
3	5.90	0.79
4	5.24	0.68

The results from Table 10 showed that all the items on Value of Task Sub-scale have slope parameters (α) greater than 1.0 indicating that all the items were able to discriminate between individuals with varying levels of the Value of Task trait.

Table 11: Slope Index of Ability beliefs Sub-scale

Item	α	s.e.
5	3.98	0.37
6	5.41	0.65
7	4.01	0.36
8	2.30	0.19

The results from Table 11 showed that all the items on Ability Beliefs Sub-scale have slope parameters (α) greater than 1.0 indicating that all the items were able to discriminate between individuals with varying levels of the Ability Beliefs trait.

**Table 12:** Slope Index of Task Characteristics Sub-scale

Item	α	s.e.
9	4.23	0.40
10	3.99	0.38
11	2.78	0.22
12	2.75	0.23

The results from Table 12 showed that all the items on Task Characteristics Sub-scale have slope parameters (α) greater than 1.0 indicating that all the items were able to discriminate between individuals with varying levels of the Task Characteristics trait.

**Table 13:** Slope Index of Effort Beliefs Sub-scale

Item	α	s.e.
13	2.78	0.21
14	4.32	0.43
15	3.40	0.29
16	3.26	0.30

The results from Table 13 showed that all the items on Effort Beliefs Sub-scale have slope parameters (α) greater than 1.0 indicating that all the items were able to discriminate between individuals with varying levels of the Effort Beliefs trait. In addition, AAI was depicted through a Test Characteristic Curve, as shown in Figure 1 which is a graphical representation of the probability of correct response at each ability level for all the items on the scale.
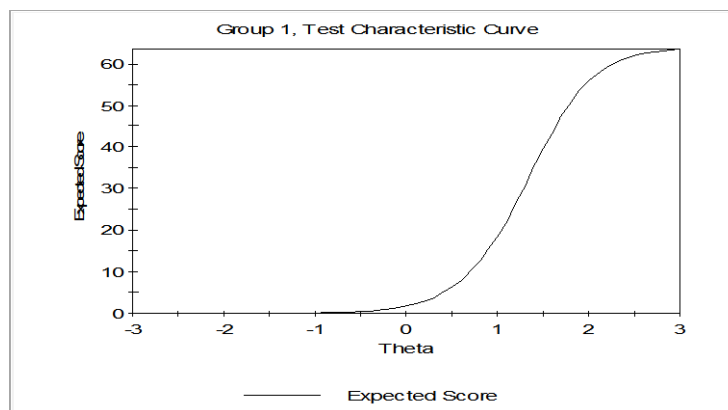
Figure 1: Test Characteristic Curve of AAI

Each of the sub-scales items were also depicted through an Item Category Curve, similar to figure 2, to depict the item's psychometric structure (see Appendix A). The Item Category Curves in Appendix A are graphical representations of the items and can illustrate items that discriminate well and items that do not discriminate among individuals with different levels of the subscales traits. Figure 2 is an example of items with high slope parameter whose category response curves are steep enough to discriminate between examinees with varying levels of the Value of Task sub-scale trait.
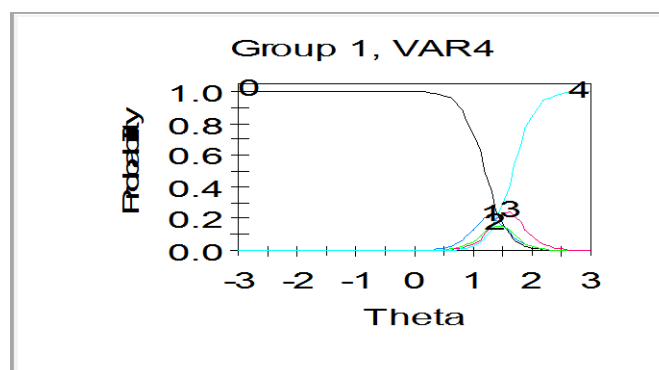
Figure 2: Example of an item with a high slope parameter (Item 4)

IX. Discussion

From the preliminary analysis, the results showed that the reliability coefficients of AAI and its sub-scales were consistently high indicating that AAI is a reliable measure. It must be acknowledged that the assessment of the reliability coefficients of AAI and its sub-scale scores yielded values that were above the commonly accepted 0.80 criteria [23]. The results from the overall item endorsement and category thresholds of AAI and its subscales showed that all the items had high location parameters indicating that it is more difficult for many examinees to endorse positive functioning on the scale and its sub-scales traits.

Finally, the results from the slope index of AAI and its sub-scales showed that all the items were able to discriminate between individuals with varying levels of the AAI and its sub-scales traits. The Test Characteristic Curve of AAI was appropriate and all the Item Category Curves of each of the sub-scale items had high slope parameters whose category response curves are steep enough to discriminate between examinees with varying levels of each of the sub-scales traits.
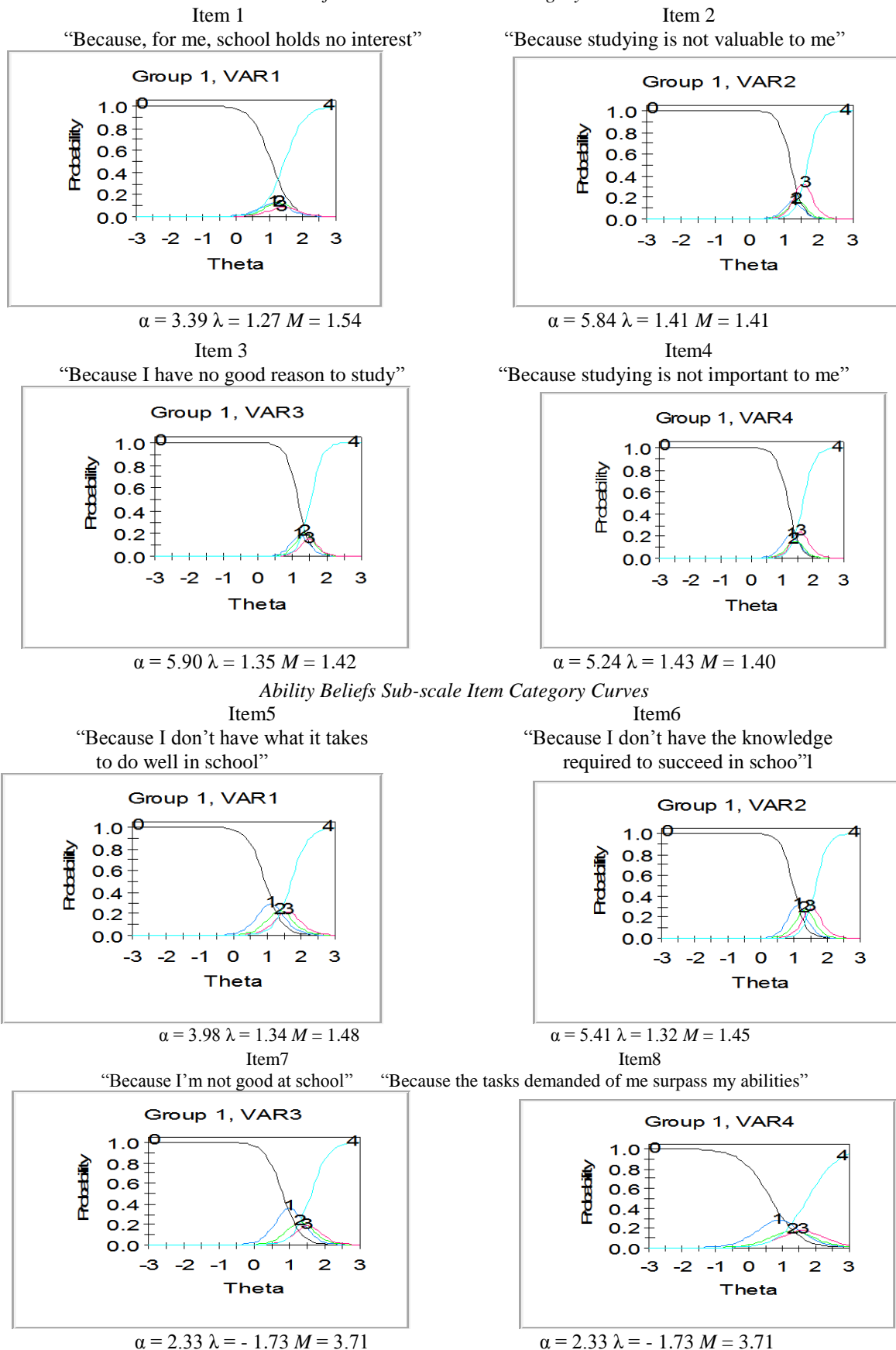
X. Conclusion

The study therefore concluded that AAI continues to have strong psychometric properties and is a sound measure of academic amotivation. Many secondary schools in Southwestern Nigeria would benefit from utilizing the AAI to help in identifying some of the reasons why students do not want to study or do school work.

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Appendix A
AAI Item Category Curves
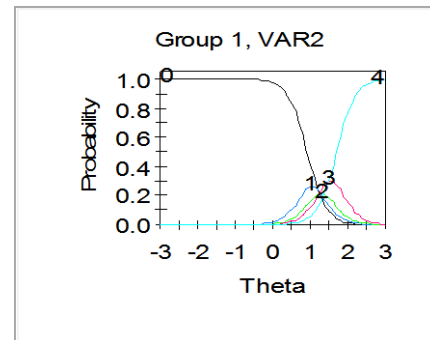*Value of Task Sub-scale Item Category Curves*

Item 1
"Because, for me, school holds no interest"

Group 1, VAR1

$\alpha = 3.39 \; \lambda = 1.27 \; M = 1.54$

Item 2
"Because studying is not valuable to me"

Group 1, VAR2

$\alpha = 5.84 \; \lambda = 1.41 \; M = 1.41$

Item 3
"Because I have no good reason to study"

Group 1, VAR3

$\alpha = 5.90 \; \lambda = 1.35 \; M = 1.42$

Item4
"Because studying is not important to me"

Group 1, VAR4

$\alpha = 5.24 \; \lambda = 1.43 \; M = 1.40$

Ability Beliefs Sub-scale Item Category Curves

Item5
"Because I don't have what it takes
to do well in school"

Group 1, VAR1

$\alpha = 3.98 \; \lambda = 1.34 \; M = 1.48$

Item6
"Because I don't have the knowledge
required to succeed in schoo"l

Group 1, VAR2

$\alpha = 5.41 \; \lambda = 1.32 \; M = 1.45$

Item7
"Because I'm not good at school"

Group 1, VAR3

$\alpha = 2.33 \; \lambda = -1.73 \; M = 3.71$

Item8
"Because the tasks demanded of me surpass my abilities"

Group 1, VAR4

$\alpha = 2.33 \; \lambda = -1.73 \; M = 3.71$

Task Characteristics Sub-scale Item Category Curves

Item 9
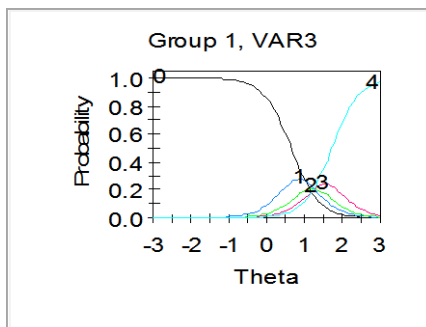"Because I find that studying is boring"

Group 1, VAR1
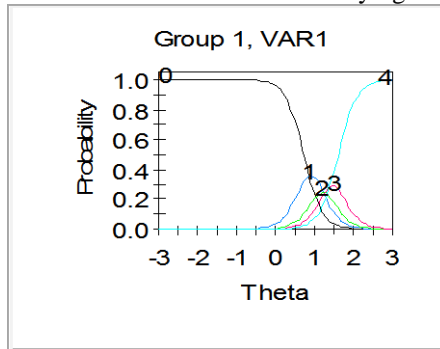
$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

Item10
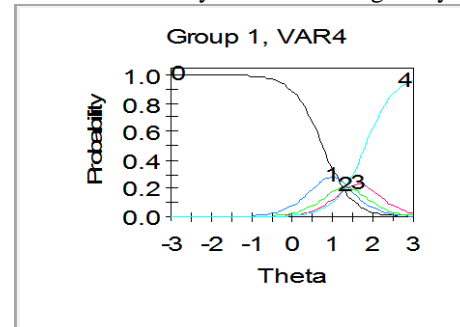"I don't like studying"

Group 1, VAR2

$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

Item11
"Because I have the impression that it's
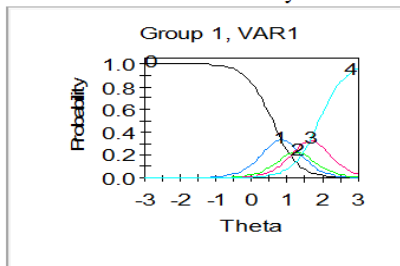
Group 1, VAR3

$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

Item12
"Because my school work is not stimulating"
always the same thing everyday"
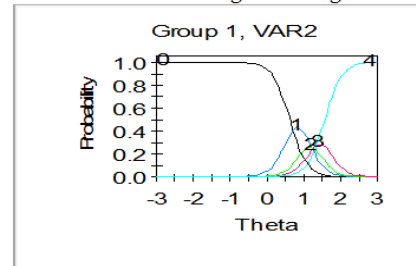
Group 1, VAR4

$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

Effort Beliefs Sub-scale Item Category Curves

Item13
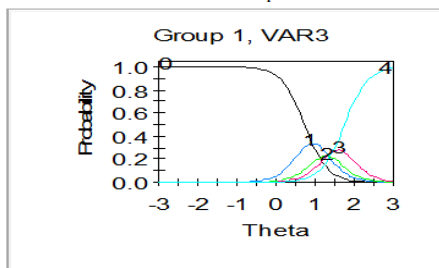"Because I'm a bit lazy"

Group 1, VAR1

$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

Item14
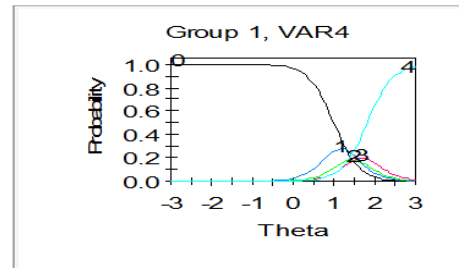"Because I'm not energetic enough"

Group 1, VAR2

$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

Item15
"Because I can't seem to invest
the effort that is required"

Group 1, VAR3

$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

Item16
"Because I don't have the energy to study"

Group 1, VAR4

$\alpha = 2.33\ \lambda = -1.73\ M = 3.71$

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