CONFIRMATORY VALIDATION OF AN INTERNATIONAL SCALE (I-PANAS-SF) AMONG UNIVERSITY UNDERGRADUATES USING ITEM RESPONSE THEORY

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Abstract
The study confirmed the factor structure of affect scale among undergraduate students of ObafemiAwolowo University, Ile-Ife and it determined the model fit of each of the positive and negative affect among the undergraduates. The study also ascertains the average scale and item discriminating power of the scale among ObafemiAwolowo University, Ile-Ife undergraduates and established the reliability of the affect scale in recent time among the University undergraduates. These were with the view of providing information on the psychometric properties and usability of the scale among university undergraduates. The study adopted the descriptive survey research design. The study population consisted of all the 29,514 male and female undergraduates of ObafemiAwolowo University, Ile-Ife for the 2018/2019 academic session. The sample comprised 1280 undergraduates that were selected using multistage sampling procedure. From the 13 faculties in the University, eight faculties were selected using simple random sampling technique and from each of the selected faculty a total of 160 undergraduates were selected using convenient sampling technique to make a total of 1280 undergraduates. An instrument titled "Positive and Negative Affect Schedule (PANAS-SF)" was adopted for collecting relevant data for the study. The scale is a self-report questionnaire that consists of two independent factors: positive and negative affect. Data collected were analysed using Model Fit Statistics {Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Fit Index (TLI) and Comparative Fit Index (CFI}, Item Response Parameter Model and Cronbach's Alpha Test. The results showed that the factor structure of the affect scale among ObafemiAwolowo University undergraduates was not consistent (RMSEA = 0.086, TLI = 0.697 CFI =0.746). The results also showed that while the positive affect fit the model and consistently measure the theoretical sub-construct (RMSEA = 0.039, TLI = 0.947 CFI =0.983) among the undergraduates, the negative affect did not fit the model and does not consistently measure the construct (RMSEA = 0.066, TLI = 0.808 CFI =0.424) among the undergraduates. The results further showed that on the average, positive and negative sub-factors of the scale moderately discriminates (x=0.997 and x= 0.823) respectively. In addition, the results showed that 90% of the items have high discrimination index. Finally, the results showed that the affect scale is reliable (r = 0.80).

The study concluded that the Positive and Negative Affect Schedule (PANAS-SF) possessed good psychometric properties and usable among ObafemiAwolowo University undergraduates.It is also interesting to examine correlations between the PANAS scales and measures of related constructs, such as anxiety, depression, and general psychological distress. PANAS scales in conjunction with a number of other commonly used measures and report. This will help to gather information regarding the development of brief scales to measure the two primary dimensions of mood—Positive and Negative Affect. There is need for further studies to resolve the conceptual and empirical controversy

Keywords: Affect, Classical test theory, Item response theory, Psychometric, Scale validation.

Introduction

Affect is a psychological construct that means outward expression of feelings. It can be described as the mental feeling that underlies all emotional experiences. Affect is innate and it describes personality. Assessment of affect is the expression of mood and emotion which are core and significant to various phenomena in human life circumstance such as social activity, life satisfaction among others. It is any facial expression or body movement that indicates emotion and mood. American Psychological Association (APA, 2006) described affect as emotion or desire influencing behavior used to describe experience of feelings and emotions which are display facial, vocal or gestural behavior.Study of affect is important to all age grade in the society. Since affect influence behavior, it may enhance or hinder many human activities, thus there is need to always assess it levels on individuals. The study on affect is important, as it helps to identify individuals with mood problems, depressive problems and neuroticism which happen among all age grade in the society(Forbes & Dahl, 2005).

Emotions and feelings can be positive or negative. Positive affect refers to optimistic human characteristics with the interaction with others and the environment. Positive affectivity is exhibited with cheerfulness, activeness, energetic and confident. It is linked with healthier coping style, open minded attitude, good self-esteem which make people more goal oriented. Negative affect is a temperamental aspect of human characteristics; it is associated to emotional distress, poor self-concept, fear, guilt and nervousness. This is linked with poor coping strategies, health complaint, worry and several mood swings. Evaluation of affect as positive and negative is referred to as valence which is the two core domains of affect. This valence also can be categorized as transitory state or relatively trait dimensional which can influence cognitive scope. Positive Affect (PA) means pleasurable engagement with the environment. There is no text provided. Psychological arousal (PA) measures the degree to which an individual experiences feelings of enthusiasm, excitement, and physical activity. Elevated levels of positive affect (PA) signify a state of complete focus, enjoyable involvement, and heightened

vitality, while diminished levels of PA imply sluggishness and melancholy. On the other hand, Negative Affect (NA) represents intense negative emotions and unease. It refers to a broad aspect of unsatisfactory involvement and personal discomfort that encompasses other emotional emotions, such as guilt, wrath, or contempt (Cotigă, 2012). Equilibrium may be achieved between positive affect (PA) and negative affect (NA) when there is a harmonious balance between the positive and negative emotions that a person experiences.

Research has shown that positive affect broadens cognitive skills, while negative affect narrows it. Broaden and build theory. Both positive and negative affect play important role in our day to day activity and experience, especially in the school activities. It is generally belief that affect influence behavior and there can be an equilibrium between PA and NA, this is when there is a balance between positive and negative feelings an individual experience which will enhance teaching and learning process in various aspect, Hence, assessment of students' affective structure is essential and vital, because it will help to understand their attitude, interest, value,acquired in school play significantly role in their cognitive achievements as well as post school life through satisfactory information on their subjective well-being. Information on this aspect of their well-being can be ofgreat significance to education stakeholders. This can be done through valid and reliable scale which brings positive changes to educational activities.This can be done through self-report information on their current feelings over a period of time. Self-report scale needs proper scrutiny by experts. One potential reason for this is that participants may not be truthful hence experts can cater for such bias. Secondly, situational factors such as distraction effect of the person during assessment, the way the items on the scale are presented. Lastly the reliability and other characteristics of self-report instruments need to be catered for. These are the issues psychometric researchers can resolve.

Affect is rooted psychology because it is a major indicator of human well-being and the basic thing about it is problem solving. It is a dimension that connects the physical appearance with the mental state. It is important to study affect extensively in all field of human endeavor because, there is great need for affect tolerance. This is the ability to react meaningfully to situation or stimulus that would ordinarily evoke anxiety sensitivity, intolerance of uncertainty and emotional distress management. The Positive and Negative Affect Schedule (PANAS) scale was created in 1988 by psychologists David Watson, Lee Anna Clark, and AukeTellegen from the University of Minnesota and Southern Methodist University in the United States. It was designed in a North American environment. The dataset comprises 20 individual words that were obtained by a main components analysis of MichealZevon and Tellegen's (1962) mood checklist. The scale primarily use the dimensions of Positive and Negative Affect as the most prominent factors. It was contended that these items extensively accessed the emotional vocabulary. The self-report instrument aims to demonstrate the correlation between positive and negative affect within certain personality characteristics. When using the PANAS, individuals

assess their emotions and provide responses via a questionnaire consisting of 20 questions and a 5-point Likert scale. The scale points are as follows: 1 represents 'very little or not at all', 2 represents 'a little', 3 represents 'moderately', 4 represents 'quite a deal', and 5 represents 'very lot'. Various time intervals may be used while using the PANAS. Participants are requested to assess the degree to which they have encountered each specific emotion throughout a certain timeframe. The time period for this research may vary depending on the study's objective, ranging from immediate to a year ago. However, for this particular study, the time span chosen was the past week. The PANAS scale has undergone validation in several cultures and languages worldwide, including Arabic, Catalan, Chilean, Dutch, English, Estonian, German, Hungarian, Japanese, Portuguese, Romanian, Russian, Spanish, Turkish, and Hindi. Additionally, it has been translated into numerous languages. Only one research has been conducted in this region among university students to investigate the psychometric features and the impact of the number of answer categories on the quality of the scale. The objective of this research is to verify the accuracy and reliability of the PANAS scale among undergraduate students at ObafemiAwolowo University, by using item response theory.

The PANAS scale is widely recognized as the most prevalent measurement tool in the field of affective research. The scale has been used in research for many objectives. The shortness of the text may be the reason for its appeal. However, several PANAS components have been identified as redundant or have uncertain meaning. For instance, the term "calm" used in the PA subscale item lacks face validity and is further supported by relatively low item-total correlations and factor loadings on the PA component. The NA item that was described as "jittery" had a comparatively lesser connection to the NA latent construct compared to the other NA items. Hence, item response theory may be used to scrutinize the scale items, thereby removing these things that exhibit comparatively low performance. Additionally, researchers should be cognizant of various constraints that may arise throughout the selection process. Firstly, the basic idea proposes that affect is a bipolar entity consisting of both valence and arousal. Nevertheless, the classification of pleasant and negative emotions has a unipolar nature that contradicts its theoretical foundation. An additional concern might be attributed to the historical limitations of the PANAS scale, since it was first designed to assess moods. The items in PANAS include a combination of many dimensions, such as affect, emotion, and mood. Certain objects do not fit into any certain category, such as disturbed and worried. Consequently, it is essential to validate the scale in order to optimize its usage. This involves determining its underlying structure via construct validation and refining the scale accordingly.

Item response theory aims to overcome the limitations of traditional test theory. The statistics of an item rely on the sample in traditional test theory models. Consequently, the statistical properties of test items are highly influenced by the specific group of individuals employed to calibrate the items. The primary limitation of traditional test theory is that the interpretation of respondent characteristics is

dependent on the test itself, rather than the specific test questions. One further limitation of traditional test theory is its assumption of equal measurement errors for all individuals. This situation is a challenge since individuals with varying levels of competence will exhibit varying degrees of inaccuracy. Another limitation of traditional test theory is its inability to make precise predictions about potential outcomes for an individual or a group based only on their ability scores. The many limitations of CTT render the process of developing and refining a scale as a tool to analyze a specific construct pointless.

To properly handle all these problems, it is necessary to use item response theory (IRT) and find a suitable IRT model that suits the test or scale items. Acquiring knowledge about the characteristics of item response theory will enable test creators to accurately assess the validity and reliability of psychological scales. Researchers in all disciplines need metrics that are both valid and trustworthy. Applying item response theory (IRT) to psychological and educational evaluation will result in significant and beneficial alterations to the construction of psychological tests.(Hambleton&Jodoin, 2003)IRT is a statistical theory that consists of many mathematical models with the following characteristics: (1) to forecast individual scores by considering their ability or latent characteristic. (2) Formulate a connection between an individual's performance on an item and the collection of qualities that influence item performance using a mathematical function known as the "item characteristic curve". (3) Unidimensionality refers to the concept that a single underlying construct is being assessed by a collection of objects in a measuring instrument. IRT offers a range of mathematical models that can be employed to forecast individual scores based on their abilities or latent traits. These models are particularly suitable for situations involving ordered categories on a rating scale, such as a Likert scale. By using these models, it is possible to effectively reduce the length of scales without sacrificing the accuracy of the assessment. Therefore, by conducting IRT analyses, it would be possible to identify items in the NA and PA domains that are highly discriminating and informative. This information can then be used to develop a shorter version of the PANAS scale that is more efficient for use in applied and research settings. This will help reduce measurement errors, research study costs, and improve research accuracy.

The PANAS scale has been rigorously evaluated and effectively used in many studies across several disciplines such as psychology, education research, medical research, and social science research since its inception. It is usual to evaluate the psychometric qualities of something and its relationship to other constructs using the tripartite model. For example, it has been used to conduct studies on subjective well-being, ageing, stress, anxiety, and other related topics. The sources cited are Brondolo, Thompson, Brady &Appel (2005), Grühn, Kotter-Grühn, &Röcke (2010), and Talbot, McGlinchey, Kaplan, Dahl, & Harvey (2010). There are still some unresolved problems about the factor structure of it and the dependability of the results. Can the original factor structure presented by Watson et al. (1988) be recreated in other locations? Furthermore, it remains unclear if the PA

and NA are separate or connected phenomena. Multiple research have made efforts to reproduce the PANAS factor structure as outlined by its creators, who defined two separate and unrelated dimensions (i.e., PA and NA). The majority of the investigations conducted by Krohne, Egloff, Kohlmann, and Tausch (1996), Terracciano, McCrae, and Costa (2003), and Crawford and Henry (2004) have concluded that the PANAS psychometric qualities are satisfactory when assessed using different research methodologies. Another advancement in the analysis of the PANAS is the use of contemporary test theory to assess the item parameters, validity, reliability, and other psychometric features that need a thorough approach for validation. Costa and McCrae (2003) referred to the independence of positive and negative emotion as a "paradox that requires further elucidation". Hence, it is essential to analyze the composition of emotions due to the existing disputes around the PANAS scale. For example, the term "calm" used in the PA subscale item lacks face validity and shows relatively low item-total correlations and factor loadings on the PA component. Furthermore, the term "jittery" had a comparatively lesser correlation with the latent construct of negative affect (NA) in comparison to the other NA items. Therefore, item response theory may be used to analyze the scale items, identifying and removing these things that demonstrate relatively low performance, thereby improving the overall quality of the scale. Embretson and Reise (2000) characterized IRT as a potent statistical tool that may be used in research to enhance evaluation scales without making any concessions.

Although Item Response Theory (IRT) has some benefits over conventional test theory in terms of reducing the length of test instruments, there is little research in this area that has used IRT technique to analyze the PANAS scale. The current research used IRT technique to analyze data from a sample of university undergraduate students, including both school-based and adult participants.

In conclusion, Affectivity is somewhat innate and plays a large role in our day-to-day experience; some people are born with the propensity of being in a good mood or bad mood as part of their personality. Nevertheless, measures should be put in place to ensure proper checks and balance in the mood state. This can be carried out at all levels of human engagement. Such as schools, work place, communities and so on because affectivity influence our thought, performance, abilities, opinion and brain.

The specific objectives of the study are to:

a. Confirm the factor structure of affect scale among undergraduate students of ObafemiAwolowo University, Ile Ife,
b. Determine the model fit of each of the positive affect among undergraduate students of ObafemiAwolowo University students, Ile- Ife,
c. Determine the model fit of each of the and negative affect among undergraduate students of ObafemiAwolowo University students, Ile- Ife,
d. Ascertain the average scale and items discriminating power among undergraduate students of ObafemiAwolowo University, Ile Ife,
e. Establish the reliability of affect scale in recent time among undergraduate students of ObafemiAwolowo University, Ile- Ife.

Research Questions

The following research questions were raised;

1. What is the factor structure of affect scale among the university undergraduates?
2. What is the model fit of positive affect among university undergraduates?
3. What is the model fit of negative affect among university undergraduates?
4. What is the average and items discriminating power of affect scale among the university undergraduates?
5. Is the scale reliable among the university undergraduates?

Methodology

The study adopted the descriptive survey research design. The population of this study comprised all undergraduate students of ObafemiAwolowo University, Ile Ife. On the university record the study population consists of 29,514 that comprised of 16,115 male undergraduate students and 13,399 female undergraduate students as at 2018/2019 academic session in the thirteen faculties in the university.The study sample consist of 1280 undergraduate students of ObafemiAwolowo University selected through multi stage sampling technique. Eight faculties out of the thirteen faculties in the university were selected using simple random sampling technique. One hundred and sixty respondents were selected across all departments in the selected faculties. In carrying out this study one research instrument was adopted to collect data from the participants. Positive and Negative Affect Schedule (I-PANAS-SF Thompson 2007)It is a self-report questionnaire that consists of two independent factors: positive and negative affect. The ten item positive affective states are: active, determined, attentive, inspired, alert, interested, strong, enthusiastic, excited and proud. The ten negative affective states are: afraid, nervous, upset, hostile, jittery, distressed, guilty, irritable, scared and ashamed.The data collected from the administered positive and negative affect schedule scale were analyzed using most prominent item response analysis. Different model fit statistics were used. Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Fit Index (TLI) and Comparative Fit Index (CFI). To answer research question three, item response parameter model was used to estimate the discrimination index for each item and find the average discriminating power of each affect sub scale. Research question four was subjected to empirical reliability analysis in Item Response Theory.

Results

Research Question One: How consistent is the factor structure of affect scale among ObafemiAwolowo University undergraduate students using item response theory?

Table 1: Consistency of factor structure of affect scale with empirical data obtained from Obafemi Awolowo University undergraduate students

	M2	Df	P	RMSEA	RMSEA_5	RMSEA_95	SRMSR	TLI	CFI
Stats	894.454	109.000	0.000	0.086	0.080	0.091	0.135	0.697	0.746

Table 1 showed that the reduced M2 was not significant (M2 (109) = 894.454, $p < 0.05$), indicating that the factor structure of the affect scale was not consistent with the empirical data.The RMSEA for the model was outside the acceptable standard (estimate was .086 [C.I.95%: 0.08, .091]. assessment of the other fit indices showed values that were with the bench mark (CFI = 0.746; TLI = 0.697, SRMSR = 0.135), indicating that the model does not fit the data. Due to the consensus across indices, the model did not reflect the data appropriately. The result showed that the factor structure established for affect scale by the developer was not consistent with the data obtained among undergraduate students of Obafemi Awolowo University, Ile-Ife. The implication of the result is that the established factor structure for the PANAS could not consistently measure the theoretical construct acclaimed by the scale among undergraduate students of Obafemi Awolowo University, Ile-Ife.

Research Question Two: How consistent is the Positive structure of affect scale among Obafemi Awolowo University undergraduate students using item response theory?

To answer this research question, a model consisting of only the positive factor and negative factor was developed respectively and the consistency of each of the models with empirical data were assessed. The result is presented as follow;

Table 2: Consistency of positive affect factor structure of affect scale with empirical data obtained from Obafemi Awolowo University undergraduate students

	M2	df	p	RMSEA	RMSEA_5	RMSEA_95	SRMSR	TLI	CFI
Stats	6.234	5	0.2841	0.039	0.015	0.066	0.056	0.947	0.983

Table 2 showed that the reduced M2 was significant (M2 (5) = 6.324, $p > 0.05$), indicating that the positive construct of the affect scale was consistent with the empirical data. The RMSEA for the model was within the acceptable standard (estimate was .039 [C.I.95%: 0.015, .066]. Assessment of the other fit indices showed values that were greater than the bench mark (CFI = 0.983; TLI = 0.947, SRMSR = 0.05), indicating that the model fitted the data. Due to the consensus across indices, the model did reflect the data appropriately. The result showed that the positive affect items established for affect scale by the developer was consistent with the data obtained among undergraduate students of ObafemiAwolowo University, Ile-Ife. The implication of the result is that the established positive affect construct of the affect scale consistently measure the theoretical sub-construct acclaimed by the scale among undergraduate students of ObafemiAwolowo

University, Ile-Ife.

Research Question 3: How consistent is the Negative structure of affect scale among Obafemi Awolowo University undergraduate students using item response theory?

Table 3: Consistency of negative affect factor structure of affect scale with empirical data obtained from Obafemi Awolowo University undergraduate students

	M2	df	P	RMSEA	RMSEA_5	RMSEA_95	SRMSR	TLI	CFI
Stats	28.316	5	0.000	0.066	0.044	0.091	0.046	0.424	0.808

This shows that the reduced M2 was not significant (M2 (5) = 28.316, $p < 0.05$), indicating that the negative affect factor of the affect scale was not consistent with the empirical data. The RMSEA for the model was outside the acceptable standard (estimate was 0.066 [C.I.95%: 0.044, .091]. Assessment of the other fit indices showed values that were lesser than the minimum standard (CFI = 0.808; TLI = 0.424, SRMSR = 0.046), indicating that the model does not fit the data. Due to the consensus across indices, the model did not reflect the data appropriately. The result showed that the negative affect factor of the affect scale established for affect scale by the developer was not consistent with the empirical data obtained among undergraduate students of Obafemi Awolowo University, Ile-Ife. The implication of the result is that the established negative affect factor of the affect scale could not consistently measure the theoretical construct acclaimed by the scale among undergraduate students of Obafemi Awolowo University, Ile-Ife.

Research QuestionThree: What are the items and average scale discriminating power of the affect scale among Obafemi Awolowo University undergraduate students?

To answer this research question, the discrimination parameter of the items was extracted from the calibrated affect scale and the average of the discrimination item parameters were estimated.

Table 4: Discrimination parameter of the affect scale items

	a1	a2
INTERESTED	0.368	
EXCITED	0.97	
UPSET		0.559
STRONG	1.095	
GUILTY		1.126
SCARED		0.207
HOSTILE		0.284
ENTHUSIASTIC	1.139	
PROUD	-0.403	
IRRITABLE		0.912
ALERT	1.025	
ASHAMED		1.414
INSPIRED	1.803	
NERVOUS		0.961
DETERMINED	2.058	
ATTENTIVE	0.381	
JITTERY		1.077
ACTIVE	1.534	
AFRAID		1.513
DISTRESSED		0.174
Mean	0.997	0.823
STD	0.483	0.466

Table 4. presents the item parameters of the affect scale on the two dimensions (positive and negative affect factors) underlying the scale. The columns labeled a1 and a2 represent the discrimination parameter of the items at dimension 1 (positive affect) and 2 (negative affect) respectively. The table showed that out of the 10 items of positive affect, item labelled as proud has low discrimination power. The result showed that 9 (representing 90%) of the items of the positive affect sub-factor had high discrimination power. Furthermore, all the items of the negative affect sub-scale of the PANAS scale were relatively high. On the average, positive and the negative sub-factors were of moderate discrimination (positive sub-factor, mean = 0.997, STD = 0.483 and negative sub-factor, mean = 0.823, STD = 0.466). The results showed that positive sub-factor discriminated respondents with positive affect from those without positive affect. Furthermore, the result showed that negative sub-factor discriminated respondents with negative affect from those without negative affect.

Research Question Four: How reliable is the affect scale?
To answer this research question, the responses of the undergraduate was subjected to empirical reliability analysis using Item Response Theory. The result is presented in Table 4.1.5

Table 5: Empirical reliability of affect scale

	Positive	Negative
Empirical Reliability	0.7	0.8

Table 5 showed the empirical reliability estimate of the affect scale. The table shows that positive affect sub-factor returned reliability estimate of 0.7 and the reliability estimate of the negative affect subscale returned a reliability estimate of 0.8. The result showed that the two sub-factors of affect scale were reliable. The implication of the result is that the affect scale was reliable.

Discussion of Findings

The result of the data collected indicated that the factor structure established for affect scale by the developer was not consistent with the data obtained among undergraduate students of ObafemiAwolowo University, Ile-Ife. The implication of the result is that the established factor structure for the PANAS could not consistently measure the theoretical construct acclaimed by the scale among undergraduate students of ObafemiAwolowo University, Ile-Ife.

This finding is similar and consistent with earlier reports about the scale that Anomalous and inconsistent findings. most studies have found these NA and PA scales to have low or non-significant correlations with one another. Aaron (2016) used factor analysis to examine the competing factor structure of PANAS in Nigeria and found that the scale performed poorly with the 5-point response format. The version yielded poor fit with inconsistent fit value because the two factor model failed to yield reach acceptable values. The researcher established that the behaviour of the scale is a function of the response format. This was also reported by Thompson in 2007 and both researchers advance a new frontier to the application of the scale in order to resolve the universal applicability and usability.

Ortuno-Sierra et al., (2015) conducted a study to examine the dimensional structure of Spanish version of the PANAS using adolescents and young university students' population. The result from confirmatory factor analysis revealed inconsistent model fit as there are bi-factor model and three factor model. Merz, et al (2013). findings got similar result using exploratory factor structure. The researcher identified and tested three factor structure (one-factor model, an uncorrelated two-factor model and correlated two-factor model) and retained the correlated two-factor model that has correlated error parameter. This demonstrated inconsistent factor structure with the original PANAS Thompson (2007) study using factorial analysis and item response theory reported problematic performance of some items and full

PANAS did not adequately fit. The PANAS marginally fall short of well fit model and he helped to identify poor performing items using cross national sample.

The result also showed that the negative affect of the affect scale established by the developer was not consistent with the empirical data obtained among undergraduate students of ObafemiAwolowo University, Ile-Ife. The implication of the result is that the established negative affect factor of the affect scale could not consistently measure the theoretical construct acclaimed by the scale among undergraduate students of ObafemiAwolowo University, Ile-Ife. This result is similar to the research findings Zanon, et al (2016). IRT analyses were conducted on Positive Affect (PA) and Negative Affect (NA) separately. NA test indicate moderate slopes, location parameter show items are spread over the continuum and chi square test showed some items were not well fitted. NA represented 12.8% of the total variance of 38.4%. It is clear that the two scales are different.

The results showed that positive sub-factor discriminated respondents with positive affect from those without positive affect. This is similar to Zanon, et al (2016). findings that the correlation information on the factor structure evidence of positive affect is 25.6% out of the 38.4% of the total variance which means the positive affect subscale discriminate respondents properly. The researchers concluded IRT is a worthwhile tool that increase the quality of psychological test and assessment.Carvalho et al. (2013) investigated the structural validity and reliability of positive and negative affect schedule in a large community sample in Brazil. The result showed the PANAS as bi-factor model which is consistent with the Watson et al. result and other earlier findings.

Furthermore, the result showed that negative sub-factor discriminated respondents with negative affect from those without negative affect. This means that the scale should be refined to ensure its effectiveness in this part of the world. This is similar to Ebesutani, et al (2012) findings conducted in a large school-based environment and a clinic-referred validation sample in Hawaii. Weaker properties items were discarded for instance calm and jittery items evidenced by weak discrimination and item information parameters. The validation test evidenced that the reduced scales still provide good psychometric properties. The result showed that the two sub-factors of affect scale were reliable. The implication of the result is that the affect scale was reliable. This is similar with earlier research on the psychometric properties of PANAS. Zanon et al (2016) study report that the PANAS scale coefficient alpha was 0.83 for positive affect and 0.77 for negative affect. Carvalho et al. (2013) reliability of positive and negative affect schedule in a large community sample in Brazil. The internal consistency reliability using Cronbach's alpha $\alpha = 0.87$ and 0.88 respectively. Jahanvash et al (2011) also had similar results on the internal consistency Positive affect = 0.75 and negative affect = 0.80. Feion et al, (2011) also arrived at a similar result on the internal consistency PA = 0.86 and NA = 0.84. Thompson (2007) study reported coefficient alpha of 0.82 positive affect and 0.74 for negative affect. Crawford and Henry (2004) reported similar reliability on the PANAS scale. The reliability (internal consistency) of the PANAS was estimated

using Cronbach's α was 0.89 for PA and 0.85 for NA scale this indicate the scales provide accurate estimates of internal consistency in the general adult population. Terraciano et al (2003) conducted a study on the factorial and construct validity of the Italian positive and negative affect schedule among student in Italy. The reliability of the Italian scale was adequate; Cronbach's α 0.72 for PA and 0.80 for NA using the state time frame and 0.72 for PA and 0.83 for NA using trait time frame instruction. Cronbach alpha coefficient result reported by Watson et al (1988) 0.86 - 0.90 for PA and 0.84 -0.87 for NA. These findings provide empirical support and confirmed that the PANAS scale is a valid and reliable self-report scale which have solid psychometric properties and usable across culture. Given these data, Positive and Negative Affect Schedule as a reliable, valid, and efficient means for measuring this two important dimensions of mood. The PANAS scales will provide useful information in adult samples as well, although further data are desirable to establish this fully.

Conclusion

This study aimed to expand on the results of earlier studies by investigating the factor structure of the PANAS among undergraduate students at Obafemi Awolowo University. The current research aimed to examine the discrepancies in the component structure and model fit of the scale. The first PANAS model suggested by Watson et al. (1988) did not sufficiently conform to the data. Modifications are necessary to enhance the psychometric qualities of the target sample. Additionally, the current research discovered evidence supporting the reliability, specifically the internal consistency, of the PANAS scale. However, the research indicates that while the scale is widely used in some fields of study, there is a need for more formal validation studies in other ethnic groups and populations. To summarize, the PANAS scales provide dependable, accurate, and mostly separate assessments of Positive Affect and Negative Affect.

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Recommendations

Additionally, it is intriguing to analyze the associations between the PANAS scores and assessments of interconnected concepts, such as anxiety, depression, and overall psychological discomfort. The PANAS scales are often used in combination with other regularly used measures and reported. This study aims to collect data on the creation of concise assessment tools for measuring the two main aspects of mood, namely Positive and Negative Affect.

There is need for further studies to resolve the conceptual and empirical controversy. This can be done with better models that will provide more conceptual clarity, better testing models than the independence and bipolarity confusion. Validity and reliability of the scale will be enhanced if the confusion is resolved. The internal consistency result showed a reliable result, there is need to test for the scale stability. Good technique for the control of random and systematic error must be used. One of the major challenges with affect is the psychometric and the analysis of psychometric

will provide succinct information. The use of generalizability theory will help to gather information on the sources of error and the interaction effect of the errors on the data gathered.

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