

## ORIGINAL ARTICLE

### DEVELOPMENT AND VALIDATION OF NEGATIVE SELF-IMAGE INVENTORY

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#### Abstract

**Objective:** The aim of this study was to develop and validate the Negative Self Image Inventory (NSII). This inventory assesses the emotional and behavioural manifestations that characterize dissatisfaction with real or imagined defects in physical appearance. The 40-item inventory comprised self-descriptive statements which participants were required to respond to on a 6-point modified likert-type format ranging from 6 (strongly agree) to 1 (strongly disagree). **Methods:** Participants for the study were 500 keep-fit exercisers, in the age range of 16 – 54. Initial item collation of NSII comprised 95 items which were systematically reworked and pruned down to 66 on the basis of their face and content validity. The 66 items were administered to 30 participants in an initial pilot study. Difficult-to-understand items were dropped to reduce the scale to 44 items. An inter-item correlation was performed with Pearson Product Moment Statistic technique on the 44 items. The 4 items with weak coefficients were removed to bring NSII to 40 items. The 40 item instrument was administered concurrently with a similar test instrument – Fear of Negative Evaluation (FNE) in order to obtain the concurrent validity of this new scale. **Results:** Normative scores for NSII were: 88.04 (Males), 93.12 (Females) and 90.58 (M&F). Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bertlett's test of sphericity indicates a score of 0.71 and a chi square of 1779.31,  $df = 780$ ,  $p < 0.05$ . NSII presented a concurrent validity of 0.51, a split-half reliability coefficient of 0.78 and a Cronbach-alpha reliability of 0.82, with a 2-week test-retest reliability coefficient of 0.82. **Conclusion:** NSII is potentially a useful instrument for the assessment of anxiety associated with preoccupation with real or imagined defects in physical appearance. *ASEAN Journal of Psychiatry, Vol. 12(2), July – December 2011: XX XX.*

**Keywords:** Negative Self-Image, Inventory, Development, Validation.

#### Introduction

Successful insight and management of a given psychological difficulty is partly based on a proper diagnosis, which only a proper assessment could offer. This study seeks to develop and validate a negative self-image inventory, an assessment inventory that is expected to identify the social, emotional, physical and behavioural dimensions of negative self-image. The history of negative self-image dates back to 1960s when Dr Maltz, an America cosmetic surgeon made

some intriguing observations. He observed that some patients, who did minor facial changes, changed their personality and life dramatically, while others with greater facial changes did not seem to change. They retained their old and debilitating self-image and continued to 'see' themselves as 'ugly' and 'deformed', even though they appeared beautiful by society's standards [1]. Maltz then inferred that the reason was because such individuals continued to *think* of themselves as ugly, different and defective. This inference led him to conclude that

changing the physical image was not the real key to changes in personality and behaviour, but there must be a change in the self-image (the mental image or picture). Maltz thus proposed that personality can be improved by helping an individual to mentally “see” himself or herself, as a beautiful person after surgery, by altering the ingrained hidden pattern of thought causing the dissatisfaction. Thus, proper diagnosis and management of negative self-image is predicated on proper assessment of the precipitating psychological difficulties and anxieties. It is important to note that negative self-image concern can develop to a dysfunctional extreme level resulting in a psychopathological condition known as Body Dysmorphic Disorder (BDD) [2]. This is a disorder of imagined ugliness defined as, an intensification of normal concern with real or imagined defects in physical appearance [3-4], with significant social and interpersonal impairment. Such a pervading psychopathological problem therefore needs to be thoroughly assessed in order to ascertain its peculiar characteristics and further management. The objectives of the study are to: (i) identify items that illustrate symptoms and manifestations of negative self-image, (ii) determine the normative score for Negative Self-Image Inventory (NSII), (iii) to determine the reliability and validity scores of Negative Self-Image Inventory (NSII).

Literature has indicated that the earliest and simplest measures of physical appearance and its influence on psychological well-being were the use of schematic figures or silhouettes of varying sizes, from thin (underweight) to heavy (overweight); and the discrepancy between the individual's choices of their ideal figure versus their conception of the figure that matches their current size. [5-6-7]. In the Figure Rating Scale of Stunkard, Sorenson and Schulsinger [8], participants were asked to select from nine figures that vary in size from underweight to overweight, that which best describe their ideal and perceived self. Participants included 92 normal male and

female undergraduates. Result indicates significant correlation between figures picked and the ideal and perceived self. It was observed that most picked figures slimmer than their current weight as ideal self. This finding is not surprising, because media images presented by the society readily portray the slim and ‘beautiful’ image as the ideal while for the developing child, those at variance to this ideal could grow up feeling inferior and ugly.

Other schematic designs have been created to assess different aspects of physical appearance than overall body size. Thompson and Tantleff [9] were interested in the upper torso, particularly breast and chest-size satisfaction, and developed the Breast/Chest Rating Scale for this purpose. This involved 5 males and females schematic figures ranging from small to large upper torso. Participants were 43 males and females and test-retest reliability coefficient ranged from 0.81 for ideal breast, 0.85 for current breast and 0.69 for ideal chest. As expected, ideal size selections were larger than current size ratings, for both men and women. This is an indication that breast size and appearance could also trigger self-image anxiety.

Gardner, Friedman and Jackson [10] however criticized some of the figural scales because of the lack of consistent size gradation between adjacent figures. For instance, they evaluated Stunkard, Sorenson and Schulsinger's Figure Rating Scales and noted that the proportional change from size 5 to size 7 was 0.100 whereas the change from size 4 to size 3 was 0.176 and the change from size 3 to 2 was 0.03. Another potential problem with standardizing figure rating procedures is that the size and dimensions reflected by the figure may not match that of the participant, leaving them to state that none of the shapes looked like them. Another important observation is that the facial and hair features often appear Caucasian, which may make their use disconcerting or inappropriate with individuals of other races.

Alfonso and Allison [11] designed for 170 male and female undergraduates, an Extended Satisfaction with Life Scale with a Physical Appearance sub-scale, a shift from the figure-rating assessment. This scale tapped into issues of general satisfaction with appearance, on a 7-point likert-type scale and has an internal consistency coefficient of 0.91 and a two-week test-retest reliability coefficient of 0.83. Also, Peterson, Schulenberg, Abramowitz, Offer and Jarcho [12], developed the Self-Image Questionnaire for Young Adults (SIQYA) for 10 to 15 year olds. Standardization sample included 335 sixth grade students who were followed through 8<sup>th</sup> grade. Result indicates an internal consistency coefficient of 0.81 and a one-year test-retest reliability coefficient of 0.60.

In line with the studies reviewed, literature indicates a dearth of negative self-image assessment tests in recent times. This study therefore seeks to contribute to knowledge in this area.

## **Method**

### ***Population***

The target population was the keep-fit exercisers. The study covered participants aged 16-54 who were residents in Lagos metropolis. Participants were made up of those trying to loose weight, as well as those working to retain their toned muscle mass. Purposive sample technique was used to select the 500 participants (males 250, females 250), in the age range of 16 – 54, (mean 30 years).

### ***Research Design***

*Survey design* involved the use of 2 psychological test instruments which were administered to a sample of 500 participants. *Correlation design* was also employed for the test-retest analysis. The independent variable was time interval and the dependent variables were scores obtained with the test instruments.

## ***Instruments***

The following psychometric instruments were used:

### ***1. Negative Self-image Inventory (NSII):***

This is a 40-item test instrument validated in this study. Each item is a self-descriptive statement which participants were required to respond to on a 6-point modified Likert-type format ranging from 6 (strongly agree) to 1 (strongly disagree). Specifically, NSII taps into emotional and behavioural manifestations of real or imagined defects in physical appearance.

### ***2. Fear of Negative Evaluation (FNE):***

This is a 30-item scale with a true-false response format and was developed by Watson and Friend [13]. It measures fear of negative evaluation due to general anxiety, fear of losing social approval and ineffective social behaviour. The reliability coefficient reported by Watson and Friend [13] are: KR-20 = 0.94, and one month interval test-retest coefficient = 0.78. Using Nigerian sample, Odedeji [14] obtained a concurrent validity coefficient of 0.63 with State Trait Anxiety Inventory Form Y-2 [15].

## ***NSII Item Selection and Analysis***

The development of NSII started with initial item selection from literatures, Caballo [4], Rosen [3], informal interviews and observations. This process resulted in 95 test items. The item editors, comprising two professional colleagues and one exercise instructor, systematically reworked the items to prune them down from 95 to 66 on the basis of their face and content validity. The 66 items were administered to 30 participants in an initial pilot study. Difficult-to-understand items were further dropped to reduce the scale to 48 items. Items that participants found to be ambiguous were rephrased and this led to some items appearing similar. The items were streamlined and this brought the scale to 44 items. An inter item correlation was performed with Pearson Product Moment Statistic technique on the 44 items. Four

items with weak coefficients were removed to bring NSII to 40 items.

#### **Test Administration Procedure**

NSII and Fear of Negative Evaluation (FNE) were administered by the researcher, with the help of two research assistants, who had undergone formal training on test administration techniques. Test administration was generally conducted after establishing adequate rapport and with an assurance of confidentiality. Observations raised by the participants were also clarified. Participants were encouraged to respond honestly to the test item. NSII was administered concurrently with Fear of Negative Evaluation Scale (FNE), so as to determine its concurrent validity. NSII and FNE were initially administered to 560 participants, of which 532 were retrieved. It was observed that 22 were not properly filled. In order to match for gender, 10 of the test instruments were discarded bringing it to 500 tests.

In order to obtain the test-retest reliability coefficients of the tests, NSII and FNE were further re-administered two weeks after to 100 participants (50 males, 50 females) who also took part in the first administration.

#### **Data Analysis**

The statistical methods used in the standardization of NSII include, mean, standard deviation, Pearson Product Moment Correlation, Principal Component Factor Analysis with Iteration and Varimax Rotation and Cronbach Alpha statistics.

#### **Result**

##### **Norm Score**

The normative scores of the tests were obtained by computing the mean scores and standard deviations for the 500 participants (250 males and 250 females). The result is presented in Table 1.

**Table 1. NSII Norm for Males and Females**

Groups	NSII		FNE	
	Mean	SD	Mean	SD
Males (n=250)	88.04	25.59	13.20	5.32
Females (n=250)	93.12	26.86	13.55	5.47
M&F (n = 500)	90.58	26.32	13.37	5.39

(SD = standard deviation)

Table 1 showed that females have higher manifestations of negative self-image as measured by Negative Self-Image Inventory (NSII), with mean score of 93.12. The female group also obtained higher mean score on Fear of negative evaluation (FNE), a validation scale, with score of 13.55. Mean scores for males were 88.04 for NSII and 13.20 for FNE. Overall mean score for both male and females were 90.58 for NSII and 13.37 for FNE. Thus, norm score of 90.58 and above for both males and females on NSII is an indicative of negative self-image manifestation.

##### **Reliability Score**

Pearson Product-Moment Statistical Method was used to obtain the 14-day test-retest reliability coefficients of NSII, while Cronbach-alpha was used to obtain its internal consistency reliability coefficient. The result is presented in Table 2.

**Table 2. Reliability Coefficients of NSII**

Type	r
14-day test-retest	0.82
Split-half	0.78
Cronbach-alpha	0.82

Table 2 showed that NSII had internal consistency alpha coefficient of 0.82, split-half reliability coefficient of 0.78 and an equally strong two week test-retest reliability coefficient of 0.82.

### **Validity Score**

In order to obtain the concurrent validity of Negative Self-Image (NSII), the scores on NSII were correlated with those of Fear of Negative Evaluation (FNE) using Pearson Product-Moment Statistics. The result is presented in Table 3:

**Table 3: Correlation Matrix of NSII and FNE**

Measures	NSII	FNE
NSII	1	
FNE	0.51**	1

\*\* Significant at  $p < 0.05$ ,  $df$ , 498,  $r = 0.195$

Result in Table 3 showed significant concurrent validity coefficients of the 2 clinical measures. The concurrent validity coefficient obtained was 0.51 which is significant at  $p < 0.05$ .

### **Construct validity**

In order to further determine the factorial structure of NSII, which is an aspect of construct validity, Factor analysis, Principal Component and direct varimax rotation were used [16]. However, in order to obtain information about the factorability of the data, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bertlett's test of spericity were computed. The result obtained was: 0.71 and a chi square of 1779.31,  $df = 780$ , at  $p < 0.05$  respectively. Thus, as a measure of factorability, KMO values of 0.60 and above are acceptable [16]. The obtained value of 0.71 is greater than 0.6, an indication that it is above the acceptable value, and also significant.

A further factor analysis with iteration was used to factor analyze the scores of the 500 participants. The result is presented in Table 4.

**Table 4: Initial Eigenvalues of the Extracted Components**

Factors	Eigenvalues	Percentage of Variance	Cumulative Percentage
1	8.32	20.81	20.81
2	3.67	6.67	20.48
3	2.29	5.74	33.22
4	2.20	5.40	38.71
5	1.96	4.89	43.60
6	1.87	4.66	48.27
7	1.68	4.20	52.47
8	1.58	3.95	56.41
9	1.36	3.41	59.82
10	1.25	3.12	62.95
11	1.21	3.03	65.97
12	1.48	2.87	68.84
13	1.03	2.57	71.41

The result in Table 4 showed that 13 Factors with eigenvalues greater than 1 were extracted and they accounted for a total of 71.41% cumulative variance. The items that loaded in each of the factors and their communalities are presented in Table 5 and appropriately named.

**Table 5: Name, Extracted Factor and Items that Loaded on them**

S/N	Item No.	Item Name	Factor Loading	Factor Name
1	32	People think I look older than my age	0.45	Body-image anxiety
	34	I feel jealous of people I think are better than me	0.51	
	37	My appearance makes me avoid public places	0.51	
	40	People think I am quiet and timid	0.55	
	35	I wish my skin is smooth	0.59	
	30	I believe my ears are ugly	0.74	
	22	I feel that my buttocks are fat and shapeless	0.77	
2	6	People think I have an unpleasant odour	0.56	Poor self-confidence
	11	My shoulders are not as broad as I want	0.65	
	14	I believe that my head is too big/small	0.66	
	20	I don't like my cheeks	0.67	
	17	I believe I lack self-confidence	0.70	
3	26	My baldness bothers me	0.43	Social awkwardness
	39	I believe people don't respect me	0.46	
	12	I feel that my face is not attractive	0.69	
	24	I am not satisfied with the shape of my eyes	0.73	
	16	I feel I cannot go for certain jobs	0.77	
4	21	People think I am old-fashioned	0.70	Complexion dissatisfaction
	19	I want to tone-up my complexion	0.75	
	31	I would like to change the colour of my hair	0.77	
5	3	I feel intimidated when I am with beautiful people	0.46	Self consciousness
	9	I feel embarrassed about my height	0.46	
	7	I will like to go for plastic surgery	0.57	
	23	I feel uncomfortable among learned people	0.65	
	18	I have physical defects that I try to hide	0.70	
6	29	My thighs are too heavy/thick	0.41	Embarrassment
	33	I wish I am part of another race	0.67	
7	27	I have the nicest lips around	0.75	Self monitoring/ Admiration
	25	I love looking at myself in the mirror	0.78	
8	13	I like reading newspaper health columns	0.41	Body-checking Behaviour
	1	I weigh myself every now and then	0.58	
	8	My breasts are too small/big	0.66	
	15	I don't like the acne/pimples on my face	0.66	
9	4	I am too fat/thin	0.78	Fixation with stomach/body size
	2	I believe my stomach is big	0.86	
10	10	I often avoid close physical contact with people	0.54	Poor personal space
	38	I am not satisfied with the shape of my neck	0.73	
11	5	I believe that people talk behind my back	0.78	Fear of negative evaluation
12	36	I sometimes diet to remain in shape	0.82	Dieting
13	28	I am not satisfied with the shape/colour of my teeth	0.74	Dentition dissatisfaction

The result in Table 5 showed that 7 items loaded significantly in factor 1; 5 each in factors 2 and 3; 3 in factor 4 and 5 items in

factor 5. Factors 6 and 7 each had 2 items loaded on them; 4 items were loaded in factor 8; 2 in factors 9 and 10, and 1 each in

factors 11, 12 and 13 respectively. The items were arranged in descending order of loading in each factor, and name appropriately.

## **Discussion**

Psychological instruments continue to be one of the most powerful and essential tool for obtaining objective information about human behaviour. The development and validation of negative self-image inventory is an effort to contribute to the body of knowledge in this area. The first effort about any newly developed instrument is to determine its reliability and validity, that is, to measure what it was designed to measure [17]

The aim of this study was to develop and validate the Negative Self-Image Inventory (NSII) of which participants were keep-fit exercisers. Findings from this study showed that the normative score for NSII is 90.58. Thus scores more than 90.58 is an indication of manifestations of negative self-image. Result further revealed norm scores for females to be 93.12, and males: 88.04. This indicates that females appear more disturbed about physical appearance than the males. This is not surprising because females appear to be socialized into equating beauty and physical attractiveness with success and competence. They are bombarded daily by the electronic media on beauty ideals with marketers presenting beauty products that are sometimes ineffective. However, this does not necessarily mean that behavioural and emotional manifestation of negative self-image is gender specific as men are gradually drawn into the beauty ideal and anxieties.

Results further indicate that NSII has an alpha coefficient of 0.82, a split-half reliability of 0.78, and a test-retest reliability coefficient of 0.82. According to Aiken [18], for a test to determine if the mean score of the two groups of people are significantly different, a reliability coefficient of 0.60 to

0.70 may be satisfactory. The reliability coefficient of alpha and split-half obtained on the NSII are above the range and also above the commonly held rule of a minimum Cronbach alpha of 0.70. The reliability values obtained for the NSII is comparable to those of other similar tests like the Self-Image Questionnaire for Young Adults (SIQYA) by Peterson et. al., [12] who reported a reliability coefficient of 0.81, and Offer Self-Image Questionnaire [19], with 0.53 to 0.70 coefficients.

The validity statistics indicate that NSII has a concurrent validity of 0.51. This was obtained by correlating it with Fear of Negative Evaluation (FNE), a similar test instrument. This result is positive and significant. This thus confirmed Aiken [18] claim that a construct validated instrument should have high correlations with other measures or methods measuring the same construct (convergent validity), but low correlations with measures of different construct (divergent validity). This statement was further amplified by Brace, Kemp and Sineglar [16], assertion that convergent validities above 0.85 show that the scales are very similar and might not necessarily be used as two different scales, while values that range between 0.50 and 0.80 show differences in the scales though they may be measures of the same construct. Conversely, values below 0.50 indicate various degrees of divergence between scales. A concurrent validity of 0.51 is an indication that NSII has good validity measure.

NSII was further subjected to factor analysis which Brace, Kemp and Snelger [16] indicates as another way of confirming construct validity of scales. The data was analyzed using the principle component analysis. An orthogonal factor greater than 1.0 was therefore found. Rotating the components, 13 factors with Eigen values greater than 1 were extracted and they accounted for a total of 71.41% cumulative variance and this conformed to Kaiser's criterion and Thurston's [20] principles. This means that the factors extracted loaded

significantly, and are independent of one another. The component factors extracted could be said to represent different factors that constituted negative self-image. Kaiser's criterion also stated that only factors having latent roots greater than 1 are considered, since factors less than 1 would add nothing to the data [21]. From the result, the first factor had an eigenvalue of 8.32 and a variance of 20.81% while the values for the last factors were 1.03 and 2.57% respectively. Specifically, result showed that the 13 factors were: Body-image anxiety, Poor self-confidence, Social Awkwardness, Complexion dissatisfaction, Self consciousness, Embarrassment, Self monitoring/admiration and Body-checking behaviour. Others were Fixation with stomach/body size, Poor personal space, Fear of negative evaluation, Dieting and Dentition Dissatisfaction.

Thus, in a bid to contribute to knowledge as well as provide insight on the behavioural and emotional manifestations of negative self-image, the Negative Self Image Inventory (NSII) was developed and validated in this study. Result indicates that NSII has good psychometric properties and thus could be viewed as a potential screening test for negative self-image manifestations, especially among keep-fit exercisers.

Limitations of this study should also be noted. The homogeneity of the sample limits the generalizability of the findings. Acknowledging the role of teasing and other developmental experiences in the etiology of negative self-image, future research could focus on children as this will aid early detection of self-image concerns and prompt management. In addition, anorexic patients as well as plastic-surgery patients could provide further insight in this area.

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