



## LATENT TRAIT THEORY DEVELOPMENT OF UNIVERSITY UNDERGRADUATES' SELF-COMPASSION SCALE

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### **Abstract**

*The study developed a set of items that measure University undergraduates' Self-compassion using Latent Trait Theory framework and it ascertained the construct validity of the developed scales. These were with the view of providing a reliable and suitable instrument to measure University Undergraduates' Self-compassion. The study employed the descriptive survey design. The population was comprised of undergraduates in South-western Nigeria universities. The sample size was 2250 students selected through a multi stage sampling procedure. The research instrument was a self-developed University Undergraduates' Self-Compassion Scale. Data were analysed using multidimensional item response theory, graded response model, factor analysis, Cronbach Alpha Coefficient and empirical reliability estimate approach. The results showed the LTT psychometric procedures of item retention and deletion reduced the 93 - item UUSCS to 21 items with five interpretable factors. The results also showed with the high convergent and discriminant validity, the five factor 21-item LTT developed UUSCS had high construct validity and reliability ( $r = 0.89$ ). The study indicated the Latent Trait Theory developed University Undergraduates' Self-Compassion Scale is a reliable and suitable instrument for the measurement of university undergraduates' self-compassion.*

**Keywords:** *Consistency of the LTT developed UUSCS, Construct validity of the developed UUSCS, Latent trait theory, Self-compassion, University undergraduates' self-compassion scale*

### **Introduction**

Compassion motivates people to go out of their way to help the physical, mental, or emotional pains of another and themselves. Compassion is often

regarded as having sensitivity, an emotional aspect to suffering, though when based on cerebral notions such as fairness, justice and interdependence, it may be considered rational in nature and its application understood as an activity it's also based on sound judgement. Compassion involves allowing ourselves to be moved by suffering and experiencing the motivation to help alleviate and prevent it. Neff and Davidson, (2016) literally complement suffering with compassion which appears to imply the acknowledgement of self-suffering in some way, coupled with a relatable response of effect, either through sympathy or concern. It is however stressed that compassion does not equate to empathy, with the key difference being that both reflect the ability to take the perspective and feel the emotions of another, compassion involves an additional desire to help (Strauss, Lever-Taylor, Gu , Kuyken, Baer, Jones, & Cavanagh , 2016). Indeed, in the views of Dalai (2012), the Buddhist tradition through which many compassion-focused interventions draw their philosophy and approach defined compassion as the wish for another to be free from suffering. He explained further that when our human intelligence is applied to our existence, then our love and compassion can indefinitely be extended, even to enemies and concluded that, the ability to analyse and plan in order to assure our long-term interest is something only human beings can do.

The term “Self-compassion” derives from the word “compassion”, which to imply a feeling of kindness, caring and understanding towards those who suffer, along with an emerging desire to mitigate their suffering and the acknowledgement of a shared, fragile and imperfect human nature (Germer & Siegel, 2012). Self-compassion as a psychological construct is important to every individual as it affect not only the affective but also the psychomotor or cognitive domains of learning. In the school system, self-compassion is one of the affective domains among others which may have a direct effect on the cognitive domain of students. Self-compassion, which is compassion directed inwards, involves treating the self with care and concern when faced with the experience of suffering, rather than with a sense of self-criticism (Neff and Dahm, 2015). Self-compassion is simply compassion directed inward, relating to ourselves as the object of care and concern when faced with the experience of suffering. It also involves being vulnerable to suffering with a sense of non-judgmental understanding. Self-compassion includes the additional elements such as self-kindness and common humanity: actively soothing and comforting

oneself when painful experiences arise, and remembering that such experiences are part of being human. Hence a person's emotional state fluctuates throughout the day, influenced by the situation and how it is perceived and coped with.

A study by Neff, Hsieh and Dejitterat (2005) suggests that self-compassion helps facilitate the learning process by freeing individuals from debilitating consequences of harsh criticism, isolation, and over identification in the face of failure, and instead provides them with self-kindness, a sense of common humanity, and emotional balance. Thus, the way a situation is coped with is important for a person's emotional state of being. In particular, self-compassion has been proven to be a predictor of a positive mental health and therefore many researchers have focused on this part of the concept of self-compassion (Terry & Leary, 2011).

Over the years cases of suicide in Nigerian tertiary institutions has been reported through the newspaper and social media but recently cases of suicide committed by undergraduate students in the tertiary institution are becoming rampant and alarming which is now a major concern for parents, guardian, lecturers, researchers, and psychologists among others. Nigerians' guardian newspaper on 25<sup>th</sup> May, 2019 reported an account of some Nigerian youths who took their own lives in the recent past in a final effort to escape from life's struggles. Within the year alone, there are about four reported cases of suicide by youths, some of who announced their intentions to take their own lives on the social media before actually committing the act.

This implies that the level of students' self-compassion may positively or negatively affect their academic achievements as well as their mental and emotional well-being. Level of students' self-compassion may also further affect other psychological constructs such students as self-efficacy, self-esteem, self-concepts, anxiety etc. According to (Gilbert, 2009) self-compassion could buffer against negative emotions when experiencing unpleasant life events. When a person responds compassionately in both academic and social situations, he or she evokes more positive emotions and perceives the situation as less stressful. It is therefore important to investigate what role self-compassion will play on student and the extent to which it will influence both the cognitive and affective domain in tertiary institutions and this will be made possible if only valid and reliable scales or measures are developed and available.

Having conceptualised what self-compassion is, Neff (2003a, 2003b) made important assertions about what self-compassion is not. She distinguished self-compassion from self-esteem, arguing that the latter involves an evaluation of the self in comparison to others, potentially resulting in self-absorbed or narcissistic behaviour, or even requiring us to put others down in order to feel good about ourselves. Self-compassion, she stated, is different because it does not rely on self-evaluation, promoting instead a stance of non-judgemental acceptance. Neff goes on to separate self-compassion from self-indulgence, highlighting that to be truly self-compassionate would mean to avoid unhealthy indulgence for the sake of instant gratification (e.g., by smoking, taking recreational drugs) as this may ultimately harm longer-term wellbeing. Finally, she distinguished self-compassion from self-pity, asserting that self-pity emphasizes personal suffering and egocentric feelings of isolation, whereas self-compassion, by her definition, would promote social connectedness and frame suffering in the context of a shared human experience (2003a). This construct thus need to be measured using scales that are appropriately develop for empirical and practical use.

Scale comprises set of items that are collectively expected to measure theoretical constructs. Scaling is the process of measuring or ordering entities with respect to quantitative attributes or traits with quantitative metric units. Scale development on the other hand is a process of creating a reliable and valid measure of a construct in order to assess an attribute of interest (Simms & Watson 2007). Scale development start with qualitative exploration of an unstudied construct or with the combining of items in an existing data set that were not originally designed to measure a particular construct of interest. Often the goal of scale development is a quantitative measure of a theoretical construct that can be used in research and practice.

There are different measurement theories that can be employed in developing a measurement scale that would lead to valid and reliable results. However in this study, the Latent Trait Theory is employed. Latent trait theory (LTT) is probabilistic model for expressing the association between an individual's response to an item and the underlying latent variable being measured by the item. LTT is a collection of measurement models that attempt to explain the connection between observed item responses on a scale and an underlying construct. Latent trait theory (LTT) is also known as the latent true score theory

with the advantage of item and test data invariance made it to be preferable. The implementation of Latent Trait Theory (LTT) to psychological and educational assessment has caused major and positive changes to psychological test or scale development.

In Nigeria, measuring students' self-compassion has not been receiving enough attention despite the importance of self-compassion in the achievement of effective and efficient teaching / learning process as well as its impact on students in tertiary institutions. Furthermore, although scales have been developed by researchers on self-compassion over the years (Neff, 2003; Murriss and Petrocchi, 2016), not much has been done to develop a local instrument to carry out such measurement. Hence, there is the need to develop a scale that measures students' self-compassion. In the consideration of the LTT development of a valid and reliable measurement tool that could measure undergraduates Self-Compassion in Nigeria, the following specific objectives are proposed. These are to

- i. develop a set of items that measure self-compassion among undergraduate students in South-western Nigeria universities using Latent Trait Theories;
- ii. ascertain the construct validity of the developed scale; and
- iii. estimate the consistency of the scale.

### **Research Question**

- i. What items are judged suitable for inclusion in the Latent Trait Theory developed University Undergraduates' Self-Compassion Scale for use among South-western Nigeria undergraduates?
- ii. . What is the construct validity of the developed UUSCS?
- iii. What is the consistency of the LTT developed UUSCS?

### **Method**

The study adopted a descriptive survey research design. The population of the study comprised 32.5 million undergraduate students in Private, Federal and State Universities in South-western Nigeria. A sample of 2,250 undergraduates was selected using a multistage sampling procedure. Three States were selected randomly from the six South-western states and from each of the selected States, three Universities were selected using stratified random sampling technique

with school ownership (Federal, State and Private) serving as bases for stratification. From each school, convenient sampling was used to select 250 students to make a sample size of 2,250. This non-probability sampling method involves selecting sample from a group of students easy to contact or to reach. The research instrument developed for this study was titled University Undergraduates' Self-Compassion Scale (UUSCS). Since the aim of the study was to develop an instrument to measure undergraduates' level of self-compassion, items were generated to effectively measure the level of self-compassion among undergraduates. The scale consists of two sections; Section A consists of respondents' personal data, such as sex, age, discipline, university, level. Section B of the scale consisted of the inventory designed for the study. It had 100 items were generated from the literature. The scale consisted of items that probe into six key areas of self-compassion. These areas are: (1) Self kindness (2) Self Judgement (3) Over Identification (4) Isolation (5) Common Humanity (6) Self Mindfulness. The response format for the scale is Likert type with four response options of Strongly Agree, Agree, Disagree, Strongly Disagree. The items on the UUSCS consisted of both positive and negative statements. This was done to ensure that respondents read and understand the items before responding to them and prevent the response set. The students' responses to each of the item were scored accordingly.

In order to test the content validity of the scale, the Content Validity Ratio (CVR) and Content Validity Index (CVI) by Lawshe 1975 was adopted. The CVI is used to determine the content validity of the entire instrument or tool. It is calculated by finding the mean of the CVR values for all items meeting the CVR threshold of 0.78. Tilden, Nelson, and May (1990) suggests CVI values exceed 0.70; however, Davis (1992) suggests a CVI exceeding 0.80 is preferred. Using the CVR item deletion criteria, 7 items were expunged from the 100 items initially generated; while the retained 93 items had a CVI of 0.98. All data were coded into R statistical software for appropriate descriptive and inferential statistics. Mokken Scaling Analysis (MSA) was used to answer research question one, research question two was answered using confirmatory mode of full information item factor analysis based on item response theory model and Empirical reliability coefficient was used to answer question three.

## Results

**Research Question 1:** What items are judged suitable for inclusion in the Latent Trait Theory developed University Undergraduates’ Self-Compassion Scale for use among South-western Nigeria undergraduates?

To answer this research question, the responses of undergraduate students was subjected to Mokken Scaling Analysis (MSA). To assess the scalability of the scale, the three Loevinger’s H scalability coefficients; Loevinger’s scalability coefficients for item-pair ( $H_{ij}$ ), Loevinger’s scalability coefficients for item ( $H_i$ ), and Loevinger’s scalability coefficients for scale ( $H_s$ ) were used. The rules of thumb for judging the scalability of the scale are as follows: a scale is weak if  $0.3 \leq H < 0.4$ , moderate if  $0.4 \leq H < 0.5$ , and strong if  $H \geq 0.5$  (Lee, Fu, Liu, & Hung, 2017). Additionally, when the items on a scale are measuring the same construct, the scalability coefficient of each pair ( $H_{ij}$ ) of items is returned a positive value. The result (see Appendix III) showed that the vast majority of the  $H_{ij}$  were positive, though not all of them are. This would seem to make sense, given that these values are normalized covariances and therefore should be positive if the items belong to the same scale. The implication of the result is that 93 items of the UUSCS do not measure the same construct theoretical construct. The individual items scalability was further assessed. The result is as presented in Table 1.

**Table 1 Scalability coefficient of the 93 items of UUSCS**

Item	H	Item	H	Item	H	Item	H
it1	0.04	it31	0.16	it61	0.09	it91	0.12
it2	0.07	it32	0.15	it62	0.12	it92	0.15
it3	0.04	it33	0.15	it63	0.10	it93	0.12
it4	0.07	it34	0.18	it64	0.14	Overall H 0.12	
it5	0.04	it35	0.15	it65	0.14		
it6	0.05	it36	0.16	it66	0.16		
it7	0.07	it37	0.14	it67	0.17		
it8	0.07	it38	0.15	it68	0.13		
it9	0.08	it39	0.05	it69	0.17		
it10	0.05	it40	0.07	it70	0.17		
it11	0.06	it41	0.04	it71	0.14		

<b>it12</b>	0.07	it42	0.09	it72	0.12		
<b>it13</b>	0.15	it43	0.15	it73	0.13		
<b>it14</b>	0.11	it44	0.15	it74	0.14		
<b>it15</b>	0.10	it45	0.19	it75	0.13		
<b>it16</b>	0.06	it46	0.18	it76	0.11		
<b>it17</b>	0.13	it47	0.18	it77	0.12		
<b>it18</b>	0.12	it48	0.17	it78	0.11		
<b>it19</b>	0.14	it49	0.18	it79	0.09		
<b>it20</b>	0.10	it50	0.16	it80	0.10		
<b>it21</b>	0.11	it51	0.18	it81	0.06		
<b>it22</b>	0.14	it52	0.19	it82	0.05		
<b>it23</b>	0.10	it53	0.18	it83	0.03		
<b>it24</b>	0.14	it54	0.16	it84	0.10		
<b>it25</b>	0.12	it55	0.17	it85	0.09		
<b>it26</b>	0.14	it56	0.15	it86	0.08		
<b>it27</b>	0.15	it57	0.15	it87	0.10		
<b>it28</b>	0.14	it58	0.13	it88	0.10		
<b>it29</b>	0.18	it59	0.17	it89	0.12		
<b>it30</b>	0.16	it60	0.10	it90	0.15		

Table 1 showed the scalability of the 93-items UUSCS. The table shows that all of the items of the UUSCS have  $H_i$  values below the minimally acceptable cut-off of 0.3, suggesting that the items are not particularly scalable. Finally, the overall  $H$  was below the 0.3 value as well, suggesting that it is not even a “weak” scale. Taken together, we would have to conclude that the set of 93 items does not make a particularly useful scale. In order to investigate the possibility of identifying subsets of items that might yield more statistically coherent scales, scalable subscales of UUSCS was searched using the exploratory mode of mokken scaling analysis, Automated Item Selection Procedure (AISP) for Mokken Scale Analysis. The result is presented in Table 2.

**Table 2: Coherent subscales of UUSCS**

	<b>Item</b>	<b>H</b>		<b>Item</b>	<b>H</b>
	IT26	0.64		IT89	0.35
	IT28	0.64	SCALE 6	IT18	0.46
	IT31	0.56		IT19	0.46



<b>SCALE 1</b>	IT30	0.55	SCALE 7	IT75	0.45
	IT27	0.53		IT77	0.45
	IT29	0.51		IT76	0.4
	IT47	0.49		IT74	0.36
	IT32	0.47		IT78	0.35
	IT66	0.45	SCALE 8	IT43	0.44
	IT20	0.43		IT44	0.44
	IT38	0.41		IT42	0.37
	IT65	0.4	SCALE 9	IT90	0.43
	IT48	0.39		IT91	0.43
	IT64	0.38	SCALE 10	IT61	0.42
	IT73	0.37		IT62	0.42
	IT46	0.37		IT60	0.34
	IT49	0.36		IT59	0.32
<b>SCALE 2</b>	IT39	0.52	SCALE 11	IT68	0.37
	IT40	0.52		IT69	0.37
<b>SCALE 3</b>	IT41	0.41	SCALE 12	IT33	0.36
	IT51	0.5		IT35	0.36
	IT52	0.5	SCALE 13	IT34	0.34
	IT50	0.48		IT79	0.35
	IT53	0.44		IT80	0.35
	IT54	0.4	SCALE 14	IT23	0.34
	IT45	0.38		IT25	0.34
	IT55	0.37	SCALE 15	IT14	0.32
	IT67	0.35		IT16	0.32
	<b>SCALE 4</b>	IT8	0.5	SCALE 16	IT70
IT9		0.5	IT71		0.31
IT1		0.43	SCALE 17	IT57	0.3
IT7		0.4		IT58	0.3
<b>SCALE 5</b>	IT81	0.47			
	IT83	0.47			
	IT82	0.41			
	IT85	0.38			
	IT88	0.37			

	IT84	0.37			
	IT87	0.36			
	IT86	0.36			

Table 2 showed the number of factors underlying the LTT developed UUSCS. The table showed that there were 17 scalable factors underlying the UUSCS under latent trait theory approach, non-parametric item response theory. To determine the number of interpretable factors that underlie the UUSCS, the items having scalability coefficient less than 0.41 and items with less than three scalable items were removed. That is nine out of the 17 scalable subscales were inconsequential. Thus, the nine subscales and the items loading on them were removed. The remaining subscales, items on them and the underlying names of the subscales are presented in Table 3.

**Table 3: Subscales and items underlying LTT developed UUSCS**

	Item No	H	Initial Item Number
<b>SUBSCALE 1 (Self Judgment)</b>	1	0.64	IT26
	2	0.64	IT28
	3	0.56	IT31
	4	0.55	IT30
	5	0.53	IT27
	6	0.51	IT29
	7	0.49	IT47
	8	0.47	IT32
<b>SUBSCALE 2 (Isolation)</b>	9	0.52	IT64
	10	0.52	IT65
	11	0.47	IT66
<b>SUBSCALE 3 (Over Identification)</b>	12	0.5	IT51
	13	0.5	IT52
	14	0.48	IT50
	15	0.46	IT49
<b>SUBSCALE 4 (Self Mindfulness)</b>	16	0.46	IT84
	17	0.46	IT85
	18	0.43	IT86

<b>SUBSCALE 5 (Self-Management)</b>	19	0.42	IT54
	20	0.42	IT55
	21	0.41	IT45

Table 3 showed interpreted factors underlying the LTT measurement framework developed UUSCS the number of items are judged suitable for inclusion. The Table showed that in all five latent traits underlie the UUSCS, with latent trait 1, 2, 3, 4, and 5 having eight, three, four, three and three substantial items respectively. Latent trait one was interpreted as “Self Judgment”; latent trait two was interpreted as “Isolation”; latent trait three, was interpreted as “Over Identification”; latent trait four was interpreted “Self Mindfulness and factor five was interpreted as “Self-Management. It thus, implied that the developed Universities Undergraduate’s Self-Compassion Scale was a multidimensional scale measuring five latent traits under latent approach to scale development shows that in all five interpretable subscales underlie UUSCS under latent trait theory approach to test development. Thus, the LTT developed UUSCS has five factors and 21 suitable adjudged items (See appendix for the full scale).

**Research Question 2:** What is the construct validity of the latent trait theory developed UUSCS?

To answer this research question, Trochim and Donnelly’s (2006), construct validity framework was also adopted. To achieve this, the items contained in the developed UUSCS under LTT measurement framework was administered to another group of students and the responses of the students to the developed UUSCS was subjected to confirmatory mode of full information item factor analysis based on item response theory model for the assessment of the consistency of the explored factors and the empirical data set. On the confirmation of the data structure, resulting item parameters were then converted into factor loading and used for the assessment of the convergent and discriminant validity that constitute construct validity. The analysis was conducted with mirt package (Chalmers, 2012) of R Language and Environment for statistical computing version 3.6.1 (R Core Team, 2019). The results are presented as follows.

**Table 4: Model-data fit assessment of the UUSCS data set**

	AIC	AIC <sub>c</sub>	SABIC	HQ	BIC	logLik	X <sup>2</sup>	Df	P
<b>GRM</b>	28896.1	28903.9	28949.2	28965.3	29069.9	-	116.89	5	0.00
	8	5	9	7	4	14411.59	9	6	0

<b>GRS</b>	28894.2	28925.8	29018.2	29058	29316.7	-			
<b>M</b>	8	4	4			14353.14			

Table 4 presented the model-data fit assessment, showing the IRT model that is best for the calibration of the Self-compassion scale. The table shows that when the fitness graded response model (GRM) and generalized rating scale model (GRSM) to the data were compared, the result showed that the GRM had AIC = 28896.18, AICc 28903.95, SABIC = 28949.29, BIC = 29069.94 values that were less than the AIC = 28894.28, AICc = 28925.84, SABIC = 29018.24, BIC = 29316.7 values of the GRSM. In addition, the Likelihood ratio test that the fit of the two model to the data set is same, showed that the fitness of the GRM and GRSM model were different from one another significantly ( $\chi^2 (56) = 116.899, p < 0.05$ ). These results showed that the GRM fitted the data better than the GRSM model. Thus, the data was calibrated using GRM.

***Consistency of explored factor with empirical data***

The overall fitness of the explored factors underlying the UUSCS was assessed by subjecting the responses of another sample different from the sample used in the development of the 21-item UUSCS to confirmatory GRM based full information factor analysis and the overall model-data fit was assessed. Table 5 presents the assessment of the consistency of the explored factor structure of UUSCS.

**Table 5: Consistency of LTT explored UUSCS factor structure with empirical data**

	<b>M2</b>	<b>Df</b>	<b>P</b>	<b>RMSEA</b>	<b>RMSEA</b>	<b>RMSEA_</b>	<b>TLI</b>	<b>CFI</b>
				<b>A</b>	<b>_5</b>	<b>95</b>		
<b>stat</b>	138.1	13	0.457	0.08	0.08	0.09	0.91	0.93
<b>s</b>	2	7	1					

Table 5 showed that the reduced M2 was not significant (M2 (137) = 138.12,  $p < 0.05$ ), indicating that the model based on the exploratory analysis did reflected the empirical data adequately. The RMSEA for the model was within the acceptable standard (estimate was .08 [C.I.95%: 0.08, .090]). Evaluation of the other fit indices showed values greater than the bench mark (CFI = 0.91; TLI =

0.93), indicating that the model fit the data. Due to the consensus across indices, the model did reflect the data appropriately. The implication of the result is that the explored factor structure of UUSCS at development stage was consistent with another empirical data. Thus, the convergent and discriminant validity of the scale were assessed using the item loading extracted from the calibrated parameters of the UUSCS. The result is presented as follows:

**Table 6: Convergent validity of 21-item UUSCS**

	<b>Item loading</b>	<b>CR</b>	<b>AVE</b>
<b>IT1</b>	0.78	0.88	0.5
<b>IT2</b>	0.76		
<b>IT3</b>	0.76		
<b>IT4</b>	0.78		
<b>IT5</b>	0.69		
<b>IT6</b>	0.61		
<b>IT7</b>	0.62		
<b>IT8</b>	0.58		
<b>IT9</b>	0.76	0.81	0.6
<b>IT10</b>	0.77		
<b>IT11</b>	0.77		
<b>IT12</b>	0.70	0.77	0.5
<b>IT13</b>	0.63		
<b>IT14</b>	0.68		
<b>IT15</b>	0.70		
<b>IT16</b>	0.83	0.88	0.7
<b>IT17</b>	0.86		
<b>IT18</b>	0.82		
<b>IT19</b>	0.89	0.89	0.7
<b>IT20</b>	0.82		
<b>IT21</b>	0.84		

Table 6 showed the convergent validity of the UUSCS under LTT measurement framework. The table showed that the item loadings of the factors were above the minimum standard, 0.5; the composite reliability estimates of the F1, F2, F3, F4 and F5 were 0.88, 0.81, 0.77, 0.88 and 0.89 respectively. Furthermore, the table showed that the average variance extracted for F1, F2, F3, F4 and F5 were 0.5, 0.6 and 0.5, 0.7 and 0.7 respectively. The result showed that the standardized factor loadings of the items on each of the sub-factors of UUSCS were greater than the minimum benchmark; the reliability estimates of the factors were also greater than the minimum benchmark, 0.70; and the AVE for the five sub-factors were greater than the minimum benchmark, 0.5. The implication of the result is that the Convergent validity, the extent of correlations of items constituting the UUSCS constructs was high.

**Table 7: Discriminant Validity of 21item UUSCS**

	<b>F1</b>	<b>F2</b>	<b>F3</b>	<b>F4</b>	<b>F5</b>
<b>F1</b>	<b>0.70</b>				
<b>F2</b>	0.57	<b>0.77</b>			
<b>F3</b>	0.24	0.36	<b>0.68</b>		
<b>F4</b>	-0.01	0.00	0.56	<b>0.84</b>	
<b>F5</b>	0.13	0.06	0.52	0.73	<b>0.85</b>

Table 7 showed the discriminant validity of the UUSCS subscales under LTT. In the table values on the leading diagonal are the square root of the AVE and the values in the of-diagonal are the inter-subscales' correlation coefficients. The table showed that for the 5 dimensions in the table, the square root of the AVE values in each column was higher than the correlation coefficients in that column. This result showed that the 21-item UUSCS developed using LTT possessed discriminant validity. In all, the results of the convergent and discriminant validity showed that the 21-item UUSCS possessed construct validity. The implication of the result is that the 21-item UUSCS developed using latent theory, has the capacity to measure self-compassion of undergraduate students.

**Research Question 3:** What is the internal consistency of University Undergraduate Self-Compassion Scale (UUSCS) developed?

To answer this question, the reliability of items that made up each of the five identified subscales on the UUSCS was estimated using empirical reliability. The result is presented in Table 8.

**Table 8: Empirical reliability of the developed University Undergraduate Self-Compassion Scale**

<b>Factors</b>	
<b>F1</b>	0.89
<b>F2</b>	0.86
<b>F3</b>	0.85
<b>F4</b>	0.87
<b>F5</b>	0.88
<b>UUSCS</b>	0.89

Table 8 showed the reliability estimate of the Latent Trait Theory developed UUSCS. The table showed that the F1 dimension of the scale consisting of eight items was reliable (0.89); f2 dimension consisting of three items was reliable ( $r=0.86$ ), f3 consisting of four items was reliable ( $r=0.85$ ), F4 consisting of three items was reliable ( $r=0.87$ ) and F5 consisting of three items was reliable ( $r=0.88$ ). The result showed that the University Undergraduate Self-Compassion scale consisting of 21 items was reliable ( $r = 0.89$ ).

### **Discussion of Findings**

The study developed a set of items that measure self-compassion among undergraduate students in South-western Nigeria universities using Latent Trait Theory. The findings from research question one showed that five latent traits underlie the UUSCS, with latent trait 1, 2, 3, 4, and 5 having eight, three, four, three and three substantial items respectively. Latent trait one was interpreted as “Self Judgment”; latent trait two was interpreted as “Isolation”; latent trait three, was interpreted as “Over Identification”; latent trait four was interpreted “Self Mindfulness and factor five was interpreted as “Self-Management. It thus, implied that the developed Universities Undergraduates Self-compassion scale was a multidimensional scale measuring five latent traits under latent trait theory approach of scale development.

More so, findings of construct validity of UUSCS under latent trait theory showed that the RMSEA for the model was within the acceptable standard and evaluation of the other fit indices showed values greater than the bench mark indicating that the model fit the data. Due to the consensus across indices, the model did reflect the data appropriately which implied that the explored factor structure of UUSCS at development stage was consistent with another empirical data. Findings also showed that the standardized factor loadings of the items on each of the sub-factors of UUSCS were greater than the minimum benchmark; the reliability estimates of the factors were also greater than the minimum benchmark, 0.70; and the AVE for the five sub-factors were greater than the minimum benchmark, 0.5. The implication of the findings is that the Convergent validity, the extent of correlations of items constituting the UUSCS constructs was high. The square root of the AVE values in each column was higher than the correlation coefficients. The finding implies that the 21-item UUSCS developed using LTT possessed discriminant validity. Thus, findings from the convergent and discriminant validity implied that the 21-item UUSCS developed using latent theory possessed high construct validity and hence has the capacity to measure self-compassion of undergraduate students.

Furthermore, findings from the reliability estimates of UUSCS showed that the model explaining the constituent of UUSCS was consistent with empirical data. The similarities of all the respective factors of UUSCS from students' sample during and after validation of the scale were very high. Therefore, the extent to which the scale was able to consistently measure self-compassion among undergraduate students was very high. The findings is in accordance with Neff (2003) in his study on development of self-compassion scale reported high internal consistency of the scale was also supported by Van Dam et al. (2011). However, finding showed that the reduced M2 was not significant indicating that the model based reflected the empirical data adequately. The RMSEA for the model was within the acceptable standard and evaluation of the other fit indices showed values greater than the bench mark indicating that the model fit the data. The findings showed the similarity of all the factors of UUSCS obtained with students' sample during and after validation of the scale were very high. Therefore, the extent to which the scale was able to consistently measure self-compassion among undergraduate students was almost perfect. The implication of the result is that the reliability of the UUSCS developed



under latent trait test theory was almost perfect. This finding is supported by (Neff, 2004) suggesting satisfactory psychometric qualities in a population with specific cultural differences comparing to previous standardization efforts. This provides empirical support for a global commonly accepted factorial structure of the Self Compassion construct/notion.

The aptness of the use of self – compassion scale among the students will assist them because it is a mindful – based intervention. Self – compassion scale will be a prospective tool for the use of school counsellor, school administrator as well as the teachers in reducing pessimism among the students. Pessimism is one of the pervasive challenges that hinder students from learning and assimilating effectively. Intuition will be provided to stakeholders through the self – compassion scale on how each individual student’s level of self – compassion could be having negative impact on their lives and their achievement in school.

### **Conclusion**

In view of the findings arising from the analysis conducted in this study, it can be confidently concluded that the Self-Compassion Scale developed by latent trait theory (LTT) approach possessed good psychometric properties (validity and reliability).

### **Recommendations**

Based on the findings of the study, the following recommendations are made:

1. The use of latent trait theory (LTT) should be employed in the development and validation of scales that measure psychological constructs.
2. Self-compassion may be especially useful as a means of countering negative self-attitudes; therefore the use of self-compassion as a mental health intervention should be explored.

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## APPENDIX

### The Latent Trait Theory Developed University Undergraduate Self-Compassion Scale

S/N	ITEMS	SA	A	D	SD
1					
2	I feel I am a complete failure as a person				
3	I hate myself.				
4	A failure like myself deserves no happiness				
5	A failure like myself deserves not to have appetite				
6	I feel guilty all of the time				
7	I blame myself for everything bad that happens.				
8	I would kill myself if I had the chance				

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9	I'm disapproving and judgmental about my own flaws and inadequacies				
10	I am dissatisfied or bored with everything.				
11	I feel irritated all the time				
12	When I'm feeling down, I tend to obsess and fixate on everything that is wrong				
13	When I fail at something important to me, I become consumed by feelings of inadequacy				
14	I find it difficult to calm down when I don't achieve my goal				
15	I feel depressed because of my experiences				
16	Even when I don't measure up to others, I get adequate praise from myself for efforts I made				
17	I always appreciate my efforts				
18	When something upsets me, I try to keep my emotions in balance				
19	When something upsets me, I get carried away with my feelings				
20	When something painful happens, I tend to blow the incident out of proportion				
21	I think over and over about things I don't like about myself				