Differential Relationships between Self-Concept Domains and Academic Achievement: Implication for Academic Behaviour Intervention

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Abstract
Self-concept is an important construct in understanding an individual adaptive capacity and ability to cope successfully with daily challenges. There is a general self-concept that could relate positively or negatively with other constructs, however, self-concept is also conceived as a multidimensional construct whereby each sub-scale is related more significantly with other constructs with similar theoretical conceptualisation. Following the later line of thought, the present study examined the differential relationships between a multidimensional self–concept and academic achievement among secondary school pupils. The participants for the study were two hundred and fifty-one senior secondary school students (boys = 127 and girls = 124; ages ranged from 14 to 17 years, M = 15.7 years, SD = 1.24). Data for the study was collected with a multidimensional questionnaire (Short Version of Self- Description Questionnaire II Marsh, 1990) and Cumulative Grade Point Average (CGPA). A combination of ex post-facto and correlation design was utilised. The results of the analysis using Fisher's r to z transformation showed that academic self-concept domains related significantly more than non-academic self-concept domains with academic achievement and the correlation within academic self-concepts and academic achievement did not differ significantly. Based on this result it was suggested that school psychologists, guidance and counsellors should focus more on behaviour interventions (e.g. Academic Self Enhancement Training) which could boost academic self-concept and academic behaviours.

Keywords: Academic achievement, self-concept, academic behaviour

Introduction

Formal education (attending school) is one of the best ways through which developing children could learn how to socialize and acquire the necessary skills that can support them, make them become useful to themselves and to the entire society (Arslantaş, 2015; Becker, Boldin & Kelin, 2016). Within the school setting, different forms of achievement tests were given to assess if the subjects taught in school had been assimilated by students (Kara & Çelikler, 2015; Sönmez & Alacapinar, 2013). Thus, an academic achievement test is expected to provide feedback to the students about their abilities based on what they were taught, help the school authorities or policymakers in selection, promotion and pointing out areas that need improvements for each or all the students. Researchers have used Cumulative Grade Point Average (CGPA) extensively as a measure of academic achievement within educational settings (Fetler, 1989; Jaiswal & Choudhuri, 2017; Preoteasa, Axante, Cristea & Preoteasa, 2016).

Academic achievement is one of the indicators of students' academic success and progress and studies have suggested that it may as well have indirect link with positive or negative psychological outcomes (Jaiswal & Choudhuri, 2017; Preoteasa, Axante, Cristea & Preoteasa, 2016).

Researchers have found that good academic achievement among students is linked to balanced psychological well-being, finishing school and going to higher institution. Poor academic achievement on the other hand, is related to dropping out of school, delinquent behaviours, and poor psychological wellbeing (Balikis, 2018; Fetler, 1989; Preoteasa *et. al.*, 2016; Saraiva, Pereira & Zamith-Cruz, 2011).

Given the importance of academic achievement for students' progress and policy makers, it is pertinent for researchers to probe variables with sound theoretical and practicable implications in explaining ways of improving academic achievement. One of such variables is "self-concept".

For over four decades, researchers have evolved and tested different models (e.g. Dimensionality of Self-structure, Self Enhancement Model, Skill Development Model and Reciprocal Effect Model) to facilitate the understanding of the nature of self-concept among school children and its possible relationships with other desirable constructs such as academic achievement (Coopersmith & Feldman, 1974; Hattie, 1992; Marsh, 2005; Marsh & Martin, 2011; Shavelson, Hubner & Stanton, 1976; Valentine, DuBois & Cooper, 2004). Following an articulated review of the seventeen defining characteristics of self-concept, Shavelson *et al.* (1976) state that self-concept is a person's self-perception that is formed through experience with and interpretations of one's environment where significant others play some important modeling roles. One of the important highlights of this definition which helped in evolving the new paradigm in the understanding of self-concept and its relationship with students' academic achievement is the dimensionality of self-concept structure: unidimensional versus multidimensional (Marsh, Byrne & Shavelson, 1988; Marsh & Martin, 2011).

Unidimensional perspectives emphasis a single relatively one-dimensional, global domain of self-concept (sometimes referred to as self-esteem). Shavelson *et al.*'s analyses and subsequent researches have given self-concept research drastic modifications over the last four decades. They opined that self-concept is a multifaceted and hierarchical construct. Thus, many other authors and researchers following these analyses have discovered a lot about the nature of self-concept (Marsh, 2005; Wylie, 1979).

Marsh *et al.* (1988) stated that the hierarchy demonstrated in Shavelson *et al.* (1976) has at its apex, a general self-concept, which is further divided into academic and non-academic self-concept. Going with this model, self-concept in particular domain (academics: e.g. English and Math; or non-academics: e.g. Emotion and Physical) combine to form a higher-order academic or non-academic self-concept (Marsh & Martin, 2011). Therefore, different forms of academic self-concepts could be substantially correlated and incorporated into a single facet of academic self-concept.

However, more than four decades of studies showed some transformation in the understanding of the trajectories in the study of self-concept. For instance, Marsh and Shavelson (1985) contrasted the prior model by Shavelson *et al.* (1976) in that English and Math self-concepts were nearly unrelated and did not combine with the school self-concept to form a single second-order academic factors. Marsh *et al.* (1988) argued against the results suggested for two second-order-academic factors representing English/academic and Math/academic self-concepts. This finding led to Marsh/Shavelson's revision of the formal Shavelson *et al.* model and the introduction of a new model, the internal/external frame of reference (I/E) model. This model according to Marsh (2005) was developed to explain why Math and English self-concepts are so distinct. Other research works (e.g., Marsh, 1990; Marsh *et al.*, 1988) have demonstrated that Math and English

self-concepts are nearly uncorrelated when compared with academic achievement in Math and English.

In a recent study, Ghazvini (2011) showed that academic self-concept only correlated higher than non-academic self-concept and total of academic and non-academic with school achievement. Though there have been some researches on self-concept and academic achievement in Nigeria (Ajunwo, 2018; Nalah, 2013; Nwafor, 2008) none however seems to have explored this new trend of ascertaining if significant differences exist between subscales of academic self-concept and non-academic self-concept in relation to academic achievement. This is important given the fact that general self- concepts and other non-academic self-concepts (e.g. emotional stability) can as well correlate significantly with academic achievement.

Therefore, the present study looked at the specific domains of academic self-concept (English, Math, and school) and domains of non-academic self-concept (physical appearance, general honesty, physical ability, emotional stability, parent relation, same-sex, opposite sex) in relation with academic achievement and in order to find out whether significant differences exist in their correlation coefficients.

The findings from this study are expected to have implications in curriculum planning for schools and in planning for self enhancement training targeted at improving academic behaviour and achievement through self-concept.

Method
Participants
Two hundred and fifty-one (251) participants were randomly selected from class registers using the table of random sampling described by (Shaughnessy, Zechmeister and Zechimeister, 2000) from three co-educational secondary schools in Nsukka Senatorial district of Enugu State, Eastern Nigeria. The selected students were all senior secondary school II (SSII) students. The sample consisted of 127 boys and 124 girls with ages ranging from 14 to 17 years, $M = 15.7$ years, $SD = 1.24$.

Instrument
Self-concept
This was measured with the short version of the Self-Description Questionnaire (SDQII-S) developed by Marsh (1990). The questionnaire had been considered a potentially useful instrument for cross-cultural studies (Marsh, Ellis, Parada, Richards and Heubeck, 2005; Nwafor, 2008). The questionnaire is a 51 items Likert-type questionnaire comprising self-descriptive statements. Each participant is expected to choose one of six responses applicable to him/her, ranging from 1 = false to 6 = true. Several subscales corresponding to several domains of self-concept are isolated by the scale. It is divided into Academic self-concept (Math self-concept, Verbal/English self-concept and School self-concept) and non-academic self-concept (Physical appearance, General, Honesty, Physical ability, Emotional stability, Parent relation, Same-sex, Opposite sex) SDII-S has been found both reliable and valid (Marsh *et al.*, 2005; Nwafor, 2008) with Cronbach's alphas ranging from .77 to .90 for the sub-scales.

Cumulative Grade Point Average (CGPA)
This is the average total score of each student for the three terms obtained from the school result composite sheet.

Procedure
Ethical clearance for the study was obtained at the University of Nigeria, Nsukka. Thereafter informed consent and assent were obtained from the school authorities and students. Then, the questionnaire was administered according to the instructions in the manual and was retrieved after completion. The questionnaire was scored according to its different domains and the raw scores correlated with the students' CGPA.

Statistical Analyses
Pearson r product movement correlation coefficient was conducted with SPSS version 24 and Fisher's *r* to *z* transformation test was used to compare the correlation coefficients.

Result
Table 1: Correlation Coefficient of CGPA and Self-concept Sub-factors

		1	2	3	4	5	6	7	8	9	10	11	12
1.	CGPA	1											
2.	Math	**.27****	1										
3.	Verbal/English	**.30****	.22**	1									
4.	School	**.38****	.40**	.46**	1								
5.	Physical appearance	**.15***	.14*	.16*	.24**	1							
6.	General	**.32****	.37**	.52**	.53**	.39**	1						
7.	Honesty	**.16***	.15*	.25**	.25**	-.05	.22**	1					
8.	Physical ability	**.11**	-.05	.06	.06	.25**	.17*	.02	1				
9.	Emotional stability	**.29****	.19*	.14*	.14*	-.07	.16*	.23	-.03	1			
10	Parent relation	**.01**	.01	.01	.01	-.05	.08	.04	.06	.01	1		
11	Same sex	**.12**	.04	.16*	.12*	.20**	.25**	.14	.14**	.13*	.10	1	
12	Opposite sex	**.04**	-.15*	-.09	-.08	-.18*	-.15*	-.14	.01	-.06	.06	-.07	1

*p<.05; **p<.01; Bold: Correlation Coefficient of CGPA and Self-concept Sub-factors

The correlation results showed that academics sub-scales and some non-academic sub-scales correlated significantly with academic achievement. They include Math r = .27, Verbal = .30, School = .38, Physical Appearance = .15, General = .32, Honesty = .16 and Emotional Stability = .29 (see Table 1).

Table 2: Z-score testing the significance of the difference between correlation coefficients of sub-scales of self-concept and CGPA

r Coefficient		Z-value of coefficients different of two *r*s	
	Math & CGPA	Verbal & CGPA	School & CGPA
1. Math & CGPA	-	.59	1.37
2. Verbal/English & CGPA	.59	-	1.01
3. School & CGPA	1.37	1.01	-
4. Physical appearance & CGPA	1.4	**1.76****	**2.77****
5. General & CGPA	.60	.25	.76
6. Honesty & CGPA	1.29	**1.65***	**2.66****
7. Physical ability & CGPA	1.85**	**2.22****	**3.22****
8. Emotional stability & CGPA	.24	.12	1.13
9. Parent relation & CGPA	**2.97****	**3.34****	**4.34****
10. Same sex & CGPA	**1.74****	**2.1***	**3.11****
11. Opposite sex & CGPA	**2.64****	**3.0***	**4.01****

*p<.05; **p<.01

Table 2 shows that there were no statistical significant differences between the coefficient of Math & CGPA and Verbal & CGPA; School & CGPA; General, Appearance, Honesty and Emotional z = .59, 1.37, .60, 1.4, 1.29, .24, p >.05 respectively. Similarly, no statistical significant difference emerged between the coefficients of verbal & CGPA and school & CGPA; general & CGPA; emotion & CGPA, z = 1.01, .25, and .12 respectively. Also, between school & CGPA and general & CGPA, emotion & CGPA, no significant coefficient difference emerged z = .76 and 1.13. However, the result showed that coefficients of Math, Verbal, and School with CGPA differed significantly from the correlation coefficients between physical appearance, honesty, physical ability, parent relation, same-sex relationship and opposite sex relationship with CGPA (see coefficient values on bold: Table 2).

Discussion
In this study, an examination was carried out to find out if correlation coefficients between various subscales of self-concept and academic achievement will differ significantly. The findings show that the correlation coefficients of academic self-concept subscales (Verbal, Maths and School) and CGPA did not differ within but when compared with non-academic self-concept subscales, significant differences emerged. While the finding concurs with the study of Ghazvini (2011) where academic related self-concept was found to correlate higher than non-academic self-concept with school work, it slightly disagrees with the study by (Marsh, 2005; Marsh & Shavelson, 1985; Marsh *et al*., 1988) which found that the correlation between Verbal and Math self-concept was nearly unrelated and did not combine with school self-concept to form a single second-order academic factor.

The present study also found that some of the non-academic self-concept subscales correlated significantly with CGPA (General & Emotional) but did not differ significantly from the

coefficients of academic sub-scales and CGPA. Thus, it can be said that general self-concept and emotional stability (sub-scales in self-concept) are equally important to academic achievement. This evidence is in agreement with previous studies (Ajunwo, 2018; Gwirayi & Shumba, 2007; Turashvili & Japaridze, 2012) in which it was found that general self-concept can influence academic achievement. The correlations between sub-scales of self-concept and specific academic achievements such as English or Maths which may explain the difference in the findings in this study and the findings of Marsh (2005) were not considered. Rather the student CGPA in all the school subjects was utilised. Thus this may be a source of limitation in comparing the present study with the internal/external frame (see Marsh, 2005).

The present findings may have implications in curriculum development; especially now that educational researchers are faced with the task of developing adequate educational packages and materials that would improve learning and achievement. It is therefore important for such developers to know that different domains of academics have different levels of impact on pupils and should be planned in a way that each will create a special effect on the learners' interest. It also has an implication on self-enhancement programmes. A study by Obidoa (1985) shows that self-concept training has an added advantage in academic achievement. Also in line with the findings of Marsh and Yeung (1997), when planning for special training on self-concept especially in an academic setting, consideration should be given to the specific domains of academic self-concept (Maths, Verbal and School). Therefore educators and counsellors alike should assess areas where individuals need adjustment and target such areas during interventions.

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