

ADOLESCENTS' SELF-STRUCTURES, MATH ACHIEVEMENT GOALS AND LEARNING STRATEGIES

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This study determined the relationship between adolescents' self-structures (self-complexity, self-construal and adolescent emotion), math achievement goal approaches (mastery, performance, and work avoidance) and learning strategies (critical thinking and metacognition). A total of 190 third and fourth-year high school students participated in the study which employed universal sampling. The descriptive correlation approach was employed to determine relationship of the variables. Results showed no significant relationship between the students' self-structures and math achievement goals as well as self-structures and learning strategies. No significant relationship existed between math achievement goal approaches and learning strategies. However, it was interesting to note that a particular component of the two variables, self-identity (adolescent emotion) was positively correlated with mastery approach (math achievement goal) with a Pearson correlation coefficient of $r = 0.155$. Furthermore, self-devaluation (adolescent emotion) was negatively correlated with critical thinking (learning strategies) with an $r = -0.166$. It could be inferred that self-structures of an adolescent did not correlate with cultivating math achievement goals to perform an academic task as well as in the application of learning strategies to attain such goals.

Introduction

The democratic ideals of the 21st century predispose the self to varied role models further accentuated by the strength of media appeal. Movies, television shows, rock videos, and magazine articles peddle the importance of outward appearance and dress, among others, glamorizing the role models one should emulate among movie stars, sports heroes, fashion models and the like. They are shown a kaleidoscope of role models, adolescents become perplexed, self-conscious, and insecure about their bodies and innate abilities. The "self" and its erratic changes have become the obsession of modern society. Knowing and nurturing the self has become a central concern and the stimulus for an outpouring of new theories, therapies, and researches in the fields of cognitive, behavioral, social psychology as well as other disciplines in the social sciences and humanities. Developmental and social-cognitive models of the self posit that cognitive development precipitates changes in self-content and structure making the self abstract, multidimensional, differentiated and integrated as well as relational and situation bound in content (as cited in Peña-Alampay, 2003). Parallel to self-development and reorganization of self is the onset of self-relevant thoughts among adolescents. Markus, Cross, and Wurf (1990) stressed the importance of self-relevant thoughts in motivation, anxiety, and performance in academic achievement. In this study, the features of the Filipino adolescent self that the researcher explored were: self-complexity, which refers to the number and degree of differentiation among self-aspect; self-construal, which refers to how others conceive the self; and adolescent emotion, the extent of identity confusion, emotional extremity and lability, self-anxiety and self-devaluation. The present study builds on prior researches of Bernardo (2003) that examined the Filipino adolescents' perceptions and beliefs on the values of education and its relationship to achievement goal and learning strategies; and Peña-Alampay's (2003) characterization of Filipino self in the aspects of self-complexity, self-construal, and negative emotions.

Intrigued by what is really in the "self" that contributes to the motivation of an individual to do something, the researcher determined to find out the significant relationship of this aspect to achievement goal and attitude of an individual in performing academic activities and the use of learning strategies which are applied to attain a learning goal.

As an educator, the researcher wondered why some students seem to work harder in their studies than others. Why do some students do the required readings, while others never open the textbook? Why do some students use superficial learning strategies, such as note memorization, while others use more sophisticated strategies such as elaboration? The answers to these questions seem to have a great deal to do with student motivation. It was also observed that students' attitudes towards studies particularly in mathematics are very expensive, exhibiting almost no motivation to study, thus, their low math performance. This particular observation is validated by the performance report on their math diagnostic test and in their College Scholastic Achievement Test (CSAT) which showed that math is one of the weakness of most of the students, particularly in the junior and senior high school students of a college (Imam, Mastura, and Jamil, 2013; Librando Jr., 2015).

With the framework, results of prior researches and observation as the backdrop, the present study embarked on an investigation of the relationship of self-structures (self-complexity, self-construal, and adolescent emotions) to Math achievement goals (performance approach, mastery approach, and work avoidance) and the use of learning strategies (critical thinking and metacognition).

Theoretical/Conceptual Framework

This study was anchored on social-cognitive, developmental, cultural, and socio-cultural theories concerning self-structures construct. Drawing from widespread developmental research, self-descriptions' content changes over time from concrete physical or behavioral characteristics to a statement of abilities and preferences to more abstract attitudes, emotions, and inner thoughts. How the self-structure affect achievement behavior of an individual was described by achievement goal theory, an important learning variable that was significantly associated with learning and academic achievement.

Achievement goal theory was defined as the integrated pattern of beliefs, attributions and affect that produces the intentions of behavior and that was represented by different ways of approaching, engaging in and responding to achievement type activities. Similarly, this theory posited that individuals aiming for success was associated with different outcomes or goals, such as mastery-approach, performance-approach, and work-avoidance (Urda, 2004). The mastery approach represented a desire to develop competence, improve skills and understand concepts. The performance approach reflected a concern with demonstrating competence and is often defined in social-comparative terms. The individual strived to demonstrate competence by outperforming others. Work-avoidance represented the goal of avoiding appearing incompetent or less competent than others.

The present study examined self-structures (self-complexity, self-construal, and adolescent emotions) and their relationship to achievement goals (performance-approach, mastery-approach, and work-avoidance) and the use of learning strategies (critical thinking and metacognition) of the third- and fourth-year high school students of a college. The dependent variables were achievement goals (performance-approach, mastery-approach, and work-avoidance) and learning strategies (critical thinking and metacognition). The independent variables were the aspects of self-structures (self-complexity, self-construal, and adolescent emotions). Figure 1 showed the interplay of the variables of the study. Figure 2 showed the full path models indicating the relationship between the variables. Path analysis as an extension of multiple correlation model, expresses the same relationship by a set of regression equations, with each variable expressed as a linear function of the preceding variable (Yaremco, Harari, Harrison, & Lynn, 1982).

Independent Variable

Dependent Variable

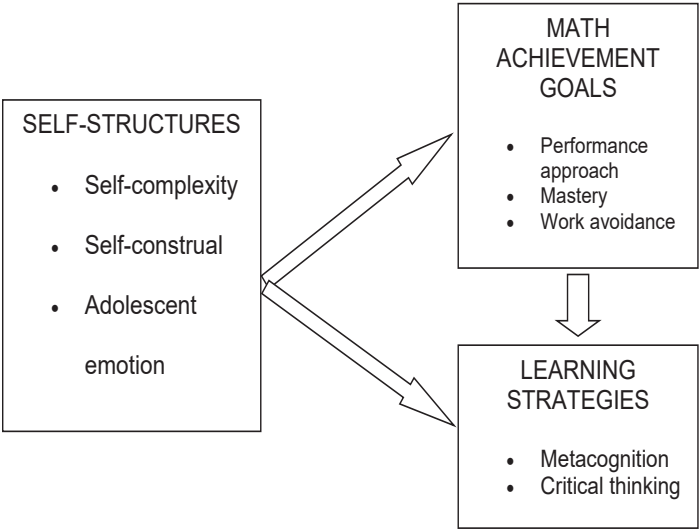
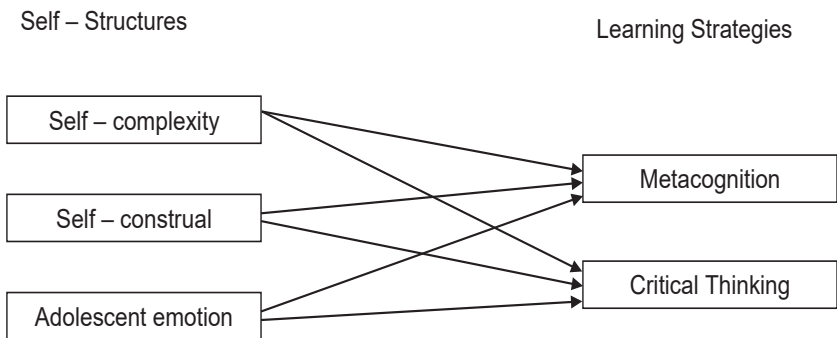
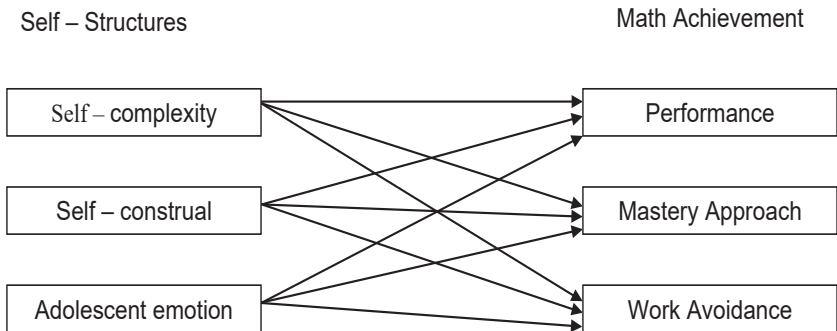


Figure 1. Theoretical/Conceptual Framework



Method

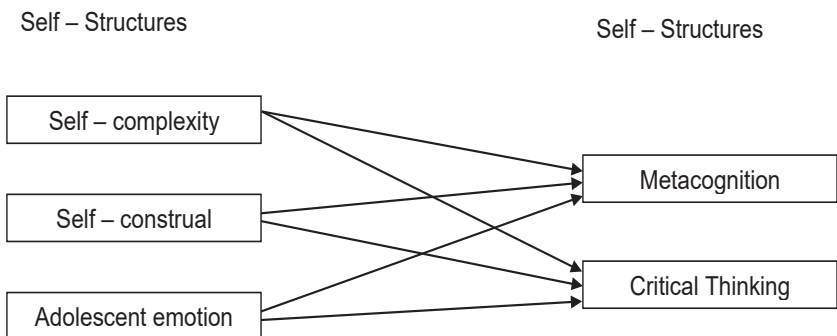


Figure 2. Full Path Analysis model indicating the relationship between self-structures, math achievement goals, and learning strategies

Methods

This study was a descriptive correlational examination of self-structures (self-complexity, self-construal, and adolescent's emotion) and its relationship to math achievement goals (performance approach, mastery-approach, and work avoidance) as well as learning strategies (critical thinking and meta-cognition). Path analyses were done exploring the relationship between self-structures, achievement goals and learning strategies of adolescent students. The study was conducted in a private Catholic college that is composed of 3 departments: post graduate, college, and basic education. There were 190 participants composed of third- and fourth-year high school students. Universal sampling technique was used. Table 1 shows the distribution of the participants by year level.

Table 1. Summary Distribution of the Participants of the Study.

Year level	Population
3 rd year	93 students
4 th year	97 students
Total no. of respondents	190 students

There were five sets of questionnaires used: 3 for self-structures, 1 for math achievement goal and 1 for learning strategies. Questionnaires for self-structures are Self-Complexity Task, Self-Construal Scale and Adolescents Emotional Scale, which are modified tests made by Peña-Alampay (2003). The tool was originally written in English and was translated into the Filipino language, pre-tested and item analyzed to establish reliability.

The Self-Complexity score, which was a function of both the number of groups formed by the participant and the degree of independence among groups, was determined by calculating the H statistic, which was interpreted as the minimal number of independent binary attributes needed to reproduce a trait sort. A higher H value was indicative of a larger number of groups (or self-aspects) formed, and greater differentiation among the traits in these groups – hence greater complexity. The formula for H is:

$$H = \log_2 n - (\sum n_i \log_2 n_i) / n$$

Where n is the total number of traits sorted (i.e., 33) and n_i is the number of traits that appear in a particular group combination.

Self-Construal, which referred to the constellation of cognitions, emotions, and behavior reflecting the individual's conception of the self, concerning and distinct from others had 2 components; the independent self construal which referred to the conception of the self as a bounded, unitary and stable entity that was composed of internal attributes and is separate from context. On the other hand, an independent self-construal referred to the conception of the self as part of the encompassing relationship.

On Adolescent Emotion, self and identity confusion (Identity), emotional extremity and lability (Emotionality), self-anxiety (Anxiety) and self-devaluation (Low self) were included. Conceptually, self and identity confusion pertained to the extent that the individual had knowledge and understanding about himself or herself, versus not knowing “the real me”. Emotional extremity and lability referred to intensity, regulation, and fluctuation of felt emotions. Self-anxiety referred to self-consciousness and sensitivity to others' opinions about the self, while self-devaluation had to do with one's feelings of satisfaction and contentment of the self.

Students' responses in these instruments: self-construal and adolescent emotion, used a 5-point Likert scale, where 1 corresponded to *Hinding-hindi Totoo* and 5 to *Totoong-totoo*.

For students' academic or motivational goals, a scale that was used were 1 – Not at all true and 7 – as Very true. Five (5) items referred to mastery-approach, the desire to develop

competence, improve skills and develop concepts; five (5) items for performance approach, which demonstrated competence by outperforming others; and five (5) items for work avoidance, which avoided being shown as incompetent or less competent than others. Pintrich, et al's. questionnaire on Motivated Strategies for Learning, where 1 – corresponded to Strongly Disagree and 7 – as Strongly Agree (as cited in Bernardo, 2003) was adapted to determine learning strategies such as critical thinking, which involves logical thinking and reasoning, and metacognition, which dealt more on the process of self-assessment and self-correction.

Standard protocols for obtaining consent from the target participants were employed including securing pertinent permissions from the school administrator. The questionnaires were administered in respective classrooms, and participants were positioned apart from each other so that opportunities to talk or look at other's work were minimized and to facilitate participants' concentration and prevent them from being influenced by the behaviors of the other participants. The session started with the researcher's introduction about herself, and the purpose of the survey, to minimize performance anxiety, and social desirability effects. After the introduction, the Adolescent Emotion Scale (AE) was administered, and then the Self-Complexity Task (SC Task) followed with the Self-Construal Scale (SCS).

The Self-Complexity Task (SC Task) was administered between the other two questionnaires. This particular arrangement was intended to minimize anxiety by letting the participants answer first a relatively simple instrument before asking them to fulfill the more complex SC task. By placing the novel SC task between the two other scales, the level of interest and task engagement was also kept high. As the researcher collected the first questionnaire (A), each participant was handed one piece of bond paper lined with one-inch-wide columns and a pack of 33 pieces 3x6 index cards, where the traits were printed in black marker pen. The standard instruction for the SC task was read orally by the researcher. Questions were entertained after giving the instructions. The participants were given 20 minutes to complete their traits sorts, with five-minute extension for those who did not finish on time. When everyone accomplished the SC Task, the third scale, Self-Construal Scale (SCS) was administered. A 20-minute break occurred before the administration of Motivated Strategies for Learning Questionnaire (MSLQ), and Math Achievement Goal Questionnaire.

Results and Discussion

The participants' Self-Complexity profile grouped by category was revealed in Table 2. As of social-relational roles, all participants perceived themselves as "*Bilang anak*" (100%) followed by the roles "*Bilang kaibigan*" (76%) and "*Bilang kapatid*" (45%). For social roles, 89 percent of the respondents exhibited "*Bilang estudyante*", then "*Bilang kapitbahay*" (12%) and "*Bilang classmate*" (7%). The social roles of "*Bilang manliligaw/niililigawan*" and "*Bilang leader*" (3%) garnered the least responses. To the situations presented in the self-complexity task, 23 percent responded: "*Kapag kasama ang mga kaibigan*" followed by "*Kapag nasa school*" (10%) and "*Kapag nasa bahay*" (8%). Only 2 percent answered "*kapag nakihalubilo sa iba*", which makes this situation is least demonstrated. The superordinate category exhibited "*Bilang ako*" (9%), as the highest, followed by "*Bilang isang mamamayang Pilipino*" (8%) and "*Bilang tao*" (7%). The lowest percentage belonged to the category "*Bilang anak ng Diyos*" (1%).

Table 2. Profile of the Self-Complexity of the respondents by category: Social Relational Roles, Social Roles, Situations, and Superordinate category (N=190).

Category	<i>f</i>	%
<i>Social Relational Role</i>		
Bilang Anak	190	100
Bilang kaibigan	145	76
Bilang kapatid	86	45
Bilang BF ^a /GF ^b	41	22
Bilang pinsan	27	14
Bilang Kuya/Ate	19	10
Bilang Apo	19	10
Bilang pamangkin	5	3
<i>Social Roles</i>		
Bilang estudyante	169	89
Bilang kapitbahay	29	12
Bilang classmate	14	7
Bilang manlalaro/dancer/musician	12	6
Bilang kausap	11	6
Bilang kaaway	8	4
Bilang bata/kalaro	7	4
Bilang leader	6	3
Bilang manliligaw/nililigawan	6	3
<i>Situations</i>		
Kapag kasama ang mga kaibigan	44	23
Kapag nasa school	19	10
Kapag nasa bahay	15	8
Kapag nasa loob ng simbahan	13	7
Kapag may exam/nagbabasa ng libro	10	5
Kapag kasama ang matatanda	10	5
Kapag namamasyal	10	5
Kapag may problema	8	4
Kapag wala sa mood/nagagalit	6	3
Kapag katabi/kausap ang crush	5	3
Kapag nakihalubilo sa crush	3	2
<i>Superordinate Category</i>		
Bilang ako	17	9
Bilang isang mamamayang Pilipino	16	8
Bilang tao	13	7
Bilang kristiyano	5	3
Bilang babae/lalake	4	2
Bilang anak ng Diyos	2	1

^a-boyfriend; ^b-girlfriend

Table 3 reflected the participants' profile of self-complexity. Fifty-nine percent of the students obtained a score that is interpreted as high self-complexity. The lowest scores were obtained by less than one percent of the respondents.

Table 3. The Profile of the Participants' Self Complexity (N=190).

Self-Structure		Scale and Verbal Description				
		4.51-5.0 VH ^a	3.51-4.50 H ^b	2.51-3.50 M ^c	1.51-2.50 L ^d	1.0-1.51 VL ^e
Self-Complexity	<i>f</i>	8	112	52	17	1
	%	4	59	27	9	0.5

^a=very high; ^b=high; ^c=moderate; ^d=low; ^e=very low

The participants' self-structure (self-construal-interdependence & independence, and adolescents' emotion, self-identity, emotional-lability, self-anxiety, & self-devaluation) was shown in Table 4. For the interdependence category of self-construal, most of the participants' responses were interpreted as *moderately true* (80%). On the other hand, no response was made for *slightly not true* and *not really true* descriptions. For the interdependence category, the responses are also interpreted as *moderately true* (61%), followed by *undecided* (34%) and *very true* (5%).

For self-identity, most of the students' responses can be described as *undecided* (51%) and *moderately true* (43%). For emotional lability, almost the same results were obtained: *undecided* (45%) and *moderately true* (50%). For self-anxiety, the respondents' scores were interpreted as *moderately true* (52%) and *undecided* (44%). The participants' self-devaluation can also be described as *moderately true* (44%) and *undecided* (52%). For all aspects of adolescent emotion, no one responded, *not really true*.

Table 4. The Profile of the Participants' Self-Structure (Self-Construal-Interdependence & Independence, and Adolescents' Emotion- Self-Identity, Emotional-Lability, Self-Anxiety, & Self-Devaluation) (N=190).

Self-Structure		Scale and Verbal Description				
		4.51-5.0 VT ^a	3.51-4.50 MT ^b	2.51-3.50 U ^c	1.51-2.50 SNT ^d	1.0-1.51 NRT ^e
Self-Construal (Interdependence)	<i>f</i>	23	152	15	0	0
	%	12	80	8	0	0
Self-Construal (Independence)	<i>f</i>	9	116	65	0	0
	%	5	61	34	0	0
Adolescents' Emotion (Self-Identity)	<i>f</i>	2	82	98	7	0
	%	1	43	51	4	0
Adolescents' Emotion (Emotional-lability)	<i>f</i>	4	85	94	7	0
	%	2	45	50	4	0
Adolescents' Emotion (Self-Anxiety)	<i>f</i>	7	97	84	2	0
	%	4	51	44	1	0
Adolescents' Emotion (Self-Devaluation)	<i>f</i>	5	84	98	3	0
	%	3	44	52	2	0

^a=very true; ^b=moderately true; ^c=undecided; ^d=slightly not true; ^e=not really true

The profile of participants' Math achievement goal (performance approach, mastery approach, and work avoidance) was shown in Table 5. The highest percentage of responses in performance approach can be described as *moderately true* (40%). This was followed by *slightly true* (25%), *undecided* (17%), and *slightly not true* (5%). None answered *moderately not true* and *not at all true*.

For the mastery approach, most of the responses were described as *moderately true* (40%) followed by *slightly true* (27%) and *very true* (24%). Six percent were described as *undecided*, whereas *slightly not true* and *moderately not true* were responded by 2 percent of the respondents. No one responded *not at all true* for mastery approach. Most of the responses were described verbally as *moderately true* (37%) followed by *slightly true* (32%). The least number of responses corresponded to the *not at all true* category at 0.5 percent.

Table 5. The Profile of the Participants' Math Achievement Goal (Performance Approach, Mastery Approach, and Work Avoidance) (N=190).

Math Achievement Goal		Scale and Verbal Description						
		6.51-7.0 VT ^a	5.51-6.50 MT ^b	4.51-5.0 SNT ^c	3.51-4.50 U ^d	2.51-3.50 SNT ^c	1.51-2.50 MNT ^e	1.0-1.50 NAAT ^f
Performance Approach	<i>f</i>	23	77	48	33	9	0	0
	%	12	40	25	17	5	0	0
Mastery Approach	<i>f</i>	45	77	51	11	3	3	0
	%	24	41	27	6	2	2	0
Work Avoidance	<i>f</i>	27	70	60	26	4	2	1
	%	14	37	32	14	2	1	0.5

^a=very true; ^b=moderately true; ^c= slightly not true; ^d=undecided; ^e=not really true; ^f=not at all true

The profile of the participants' learning strategies in terms of metacognition and critical thinking was presented in Table 6. For metacognition, forty-five percent of the participants' answers belonged to the *slightly agree* category, followed by *undecided* (28%) and *moderately agree* (20%). For critical thinking, the highest percentage of responses can be described verbally as *slightly agree* (40%) followed by *undecided* (29%) and *moderately agree* (22%). None responded to the *strongly disagree* category.

Table 6. The Profile of the Participants' Learning Strategies (Metacognition and Critical Thinking) (N=190).

Learning Strategy		Scale and Verbal Description						
		6.51-7.0 SA ^a	5.51-6.50 MA ^b	4.51-5.0 SA ^c	3.51-4.50 U ^d	2.51-3.50 SD ^e	1.51-2.50 MD ^f	1.0-1.50 SD ^g
Metacognition	<i>f</i>	1	37	85	54	9	4	0
	%	0.5	20	45	28	5	2	0
Critical Thinking	<i>f</i>	3	42	75	55	11	4	0
	%	2	22	40	29	6	2	0

^a=strongly agree; ^b=moderately agree; ^c= slightly agree; ^d=undecided; ^e=slightly disagree; ^f=moderately disagree; ^g=strongly disagree

The mean score of the participants' self-structure (self-construal-interdependence & independence, and adolescents' emotion-self-identity, emotional-lability, self-anxiety, & self-devaluation) was presented in Table 7. Self-complexity was shown below with a verbal description of *high*. While self-construal under its two components; interdependence (4.08) and independence (3.7), both had a verbal interpretation of *moderately true*. On the other hand, adolescents' emotion under each component: self-identity (3.50), emotional lability & extremity (3.45), self-anxiety (3.79), and self-devaluation (3.43) were described verbally as *undecided*. The component on self-anxiety with a mean of 3.79 was described as *moderately true*.

Table 7. Mean Score Results of the Participants' Self-Structure (Self-Construal-Interdependence & Independence, and Adolescents' Emotion- Self-Identity, Emotional-Lability, Self-Anxiety, & Self-Devaluation) (N=190).

Self-Structure	Mean	Verbal Description
Self-Complexity	3.45	High
Self-Construal <i>Interdependence</i>	4.08	Moderately true
Self-Construal <i>Interdependence</i>	3.70	Moderately true
Adolescents' Emotion <i>Self-Identity</i>	3.50	Undecided
Adolescents' Emotion <i>Emotional Lability</i>	3.45	Undecided
Adolescents' Emotion <i>Self-Anxiety</i>	3.79	Moderately true
Adolescents' Emotion <i>Self-Devaluation</i>	3.43	Undecided

Using the Pearson's Product Moment Correlation coefficient *r*, results revealed that the *p* values were greater than the level of significance of 0.05, which implied that there is no significant relationship between the students' self-structures and performance approach. It is also noteworthy that although there was no significant relationship between self-structures and performance approach, the participants' scores exhibited a very low positive correlation for the association of performance approach to self-complexity, self-construal, self-identity, and emotional lability. A very low negative correlation was also found in the relation of performance approach, self-anxiety and self-devaluation. Interestingly, results showed a positive correlation between self-identity (adolescent emotion) and mastery approach (learning strategies). However, the participants' scores exhibited very low positive relationship for the variables under self-structures and mastery approach. Also, similar to performance approach, self-anxiety and self-devaluation were negatively correlated to mastery approach.

No significant relationship existed among the variables under self-structures and work avoidance because the *p* values obtained were greater than the level of significance of 0.05. Even if the relationship is not significant, a very low correlation was found between work avoidance and self-construal, both independent and interdependent and self-identity (adolescent emotion). A very low negative correlation between work avoidance and self-complexity, emotional lability, self-anxiety and self-devaluation was noted. No significant relationship between self-structures and math achievement goals were obtained.

Table 8. Test on Significance in the Relationship Between the Students' Self Structure (Self-Complexity, Self-Construal and Adolescent Emotion) and Math Achievement Goal (Performance Approach, Mastery Approach, Work Avoidance).

	Self-Structure						
	SC	SConI	SConIn	AES	AEE	AESA	AESD
MAG and PA							
<i>r</i> value	.009	.132	.030	.105	.111	-.007	-.028
<i>p</i> value	.009	.007	.679	.151	.129	.927	.706
MAG and MA							
<i>r</i> value	.043	.06	.015	.155**	.032	-.016	-.039
<i>p</i> value	.555	.345	.832	.032	.658	.832	.590
MAG and WA							
<i>r</i> value	-.024	.137	.104	.067	-.003	-.041	-.056
<i>p</i> value	.739	.059	.153	.356	.966	.570	.441

*MAG- Math Achievement Goal, PA- Performance Approach, MA- Mastery Approach, & WA- Work Avoidance

*SC- Self Complexity; SConI- self-construal interdependent; SConIn- Self-Construal Independent; AES- Adolescents' Emotion Self- Identity; AEE – Adolescents' Emotional Liability; AESA- Adolescents' Emotion Self Anxiety; AESD- Adolescents' Emotion Self-Devaluation

** significant positive correlation

Self-devaluation (adolescent emotion) exhibited significant relationship with critical thinking (learning strategies) with a correlation coefficient of $r = 0.166$ and $p = 0.022$, implying low negative correlation. The result showed no significant relationship between self-structures and metacognition given that their p values are greater than the level of significance. However, the scores demonstrate very low positive correlation between metacognition and self-complexity, self-construal, emotional liability, and self-anxiety. Negative correlation was also found among the variables: metacognition, self-identity, and self-devaluation (Table 9).

Table 9. Test on Significance in the Relationship between the Students' Self-Structure (Self-Complexity, Self-Construal, and Adolescent Emotion) and Learning Strategies (Critical Thinking and Metacognition).

	Self-Structure						
	SC	SConI	SConIn	AES	AEE	AESA	AESD
LS and CT							
<i>r</i> value	.074	.126	.049	-.042	.019	.006	-.166**
<i>p</i> value	.311	.084	.503	.564	.194	.939	.022
LS and M							
<i>r</i> value	.088	.050	.067	-.072	.002	.041	-.084
<i>p</i> value	.230	.489	.356	.324	.976	.578	.248

*LS-Learning Strategies, CT-Critical Thinking, and M-Metacognition

*SC- Self Complexity; SConI- self-construal interdependent; SConIn- Self-Construal Independent; AES- Adolescents' Emotion Self- Identity; AEE – Adolescents' Emotional Liability; AESA- Adolescents' Emotion Self Anxiety; AESD- Adolescents' Emotion Self-Devaluation

** significant low negative correlation

No significant relationship between Math achievement goals and learning strategies was documented (Table 10). Scores also demonstrate very low positive correlation for critical thinking and performance approach, mastery approach and work avoidance. A very low negative correlation was noted between metacognition and mastery approach and work avoidance.

Table 10. Test on Significance in the Relationship between the Students' Math Achievement Goal (Performance Approach, Mastery Approach, & Work Avoidance) and Learning Strategies (Critical Thinking and Metacognition).

	<i>Math Achievement Goal</i>		
	Performance Approach	Mastery Approach	Work Avoidance
LS^a	CT^b	CT	CT
r value	.011	.039	.070
p value	.877	.589	.338
LS	M^c	M	M
r value	.002	-.006	-.036
p value	.981	.929	.621

^a =LS-Learning Strategies; ^b= Critical Thinking; ^c= Metacognition

Participants in this study generally showed high self-complexity and were described as multifaceted, including categories of roles, relationships, situations, and attributes; hierarchical, with self aspects being organized according to super-ordinate categories; and integrated, in that seemingly contradictory attributes which were included both across and within self-aspects.

The self-complexity task demonstrates the participants' descriptions of themselves. All students described themselves as son or daughter, which implies that being a son or daughter is the greatest social-relational role because they perceive themselves to play roles of being a son or daughter at home like *masunurin*, *maalalahanin*, *mapagmahal*, and the like. This is followed by the role of being a friend, which implies a high degree of social association among peers which are shown on the traits they exhibit such as *palabiro*, *masayahin*, *mabait* and the like. As to social roles, the highest percentage of responses goes to the perception of being a student, which means that these participants see themselves as performing the roles of being a student as *responsible*, *matalino*, *nakikinig*, *matiyaga* and the like, more than any other social roles such as being a neighbor or classmate. For situations, most students see themselves in *kapag kasama ang mga kaibigan as makuwento*, *masunurin*, *masayahin*, *palabiro*, and *makulit*. Hence, these high school students emphasized the company of friends and friendship as the most valuable situation for them. This was followed by *kapag nasa school*, which supports their performance of the role of a student like *nakikinig*, *palabiro*, *serioso* and the like. Under the superordinate category, most of the respondents perceived *bilang ako*, implying that they value the self most, compared to other superordinate aspects like being a Filipino citizen, being human or being Christian, which obtained a very minimal percentage.

Categories of self-aspects suggested increases in social experiences, relationships and roles attendant in the adolescent period may partly account for the increase in self-complexity. The self attributes and aspects among the respondents were more grounded on concrete relationships, roles and situations rather than on generalized abstractions.

In terms of self-construal, results indicate that the participants were more interdependent than independent, confirming that Filipino youth value good interpersonal relationships, collective goals, and social norms and values. This also means that the participants perceive themselves more in relational terms with members of groups such as family or clan rather than

for individualistic purposes. These findings are consistent with the qualitative analysis of Enriquez (1994), who describes the Filipino self as fundamentally connected with others. It was notable, however, that the participants also endorsed to a moderate extent, independent attitudes and values such as self-assertion, achievement and an autonomous self. They most likely possess a well-formed sense of self that they are confident about; for instance, *hindi problema para sa akin at sumagot at magsalita sa harap ng klase; Gusto kong maging prangkha at tapat sa mga bagong kakilala ko*. As Markus & Kitayama (1991) said, the major goals of the independent construal include expressing and enhancing the self, promoting personal goals and being direct in communication. This is also consistent with several frameworks positing an increasing argument between individualism and collectivism, especially with the pressures of globalization and modernization. Triandis (1989) noted that many cultures are neither one nor the other but maintain qualities of both. Likewise, individuals may possess cognitions about their personal and collective selves and may see themselves as both independent and interdependent, although differing in degrees. Such a bicultural self may be particularly adaptive in today's increasingly complex society, to which the youth may be most vulnerable.

As for adolescent emotions, the participants exhibited moderately varied responses to the four components. Self-anxiety was perceived to be moderately true, implying a moderately high extent of anxiety with what other people might see or think of themselves, being criticized or being rejected, like, *Madalas akong nag-aalala sa iniisip sa ibang tao sa akin; Nag-aalala ako na hindi magugustuhan ng ibang tao ang tunay kong pagkatao; Sumasama ang loob ko kapag may nampupuna sa akin*.

Meanwhile, insofar as identity confusion, emotional lability and extremity, and self-devaluation were concerned, the students were "undecided". This means that they experienced or are experiencing a degree of uncertainty of knowing and understanding themselves very well which usually results in an identity crisis. This is verified by Ericksons' psychosocial stages in which the adolescent period exhibits the formation of the self, a very crucial task (Orenstein & Lewis, 2020). As to emotional lability, the respondents demonstrate uncertainty in determining their emotional extremes such as feeling very happy and then very sad within a short period. This also reflects their uncertainty over control of feelings and emotions when confronted with unexpected events or situations like *madali akong mapasigaw, magdabog o maiyak sa sobrang galit o lungkot*. Uncertainty was also expressed by the participants in their responses for self-devaluation. This means that they are not satisfied with the value and quality of their personality, feelings: *pakiramdam ko marami akong pagkukulang; nalulungkot lang ako tuwing inisip ko ang aking sarili; naisip ko na sana ibang tao na lang ako* are some expressions of this uncertainty. This study was also undertaken to explore possible relationship between self-structures and two important learning variables: Math achievement goals and learning strategies, as well as the relationship between Math achievement goals and learning strategies. Tentative hypotheses were posed regarding the possible correlation among the variables and these were assessed using different scales.

Among the self-structures, and Math achievement goals investigated, it is only self-identity that was significantly related to the mastery approach. The correlation was positive such that greater self-identity was associated with a higher level of mastery. This result suggests that a high level of knowledge and understanding about oneself allows the individual to seek opportunities to increase their competence and master new challenges, that the exercises of competence do much to maintain one's identity and brings pleasure because it validates his or her identity. As Bernardo (2003) said, someone who aims to acquire the highest competence in a domain of learning would employ the highest level of cognitive strategies for learning. These students who are more aware of themselves pursue mastery goals and concerned with developing their ability over time. They also tend to have a more positive attitude and possess a higher level of self-efficacy or belief in their ability to succeed in a given situation. Likewise, there was no significant relationship between Math achievement goals and

metacognition. The desire of students to master the subject matter and perform well in the class is not associated with the metacognitive strategies employed to learn facts.

Conclusions and Recommendations

Despite a few significant relationships discovered among the variables, results of the current study are still relevant to schools as basis for creating programs to facilitate the development of the self. Likewise, guidance counselors and teachers can provide opportunities for the total development of the children and in dealing with the learners' individual differences that emerge across ages. Parents as stewards of children, can benefit by providing a conducive social environment for the development of sound self of the children, and by providing bases for understanding the conditions accelerating developmental changes during puberty. Being the source of physical, social, emotional, moral, and spiritual support, they can set examples for self-reliance and integrated growth. Finally, the learners will understand themselves better when they acquire knowledge about their self-structures. This will help them develop motivational goals to do their academic tasks better. Based on the findings of the study, the following are recommended: future research should endeavor to meet the demands of self-development through the various stages of their lives especially from childhood to adolescence. Likewise, it is suggested to put more emphasis on the methodologies that look into the socio-cultural practices and beliefs that shape the Filipino adolescent self and their experiences.

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