The Development of College Academic Volition Scale (CAVS)

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The present study developed a College Academic Volition Scale (CAVS) based on the model by Mccan and Garcia (2000).The CAVS consists of three factors, namely: (1) self-efficacy enhancement, (2) stress reducing actions and (3) negative-based incentive. The CAVS was correlated with the Inventory of School Motivation (ISM) (McInerney, 2004) to provide support for its concurrent validity. Both scales were pretested to 300 college students. Confirmatory Factor Analysis (CFA) was used to establish factor structure of the CAVS and the results showed that the three-factor model is the ideal model for the volition scale since the obtained value on Bollen's Rho, Bentler Comparative Fit Index, Joreskog AGFI and Joreskog GFI are greater than .90. The scale's internal consistency using Cronbach's alpha showed that all the factors of the volition scale are internally consistent. Concurrent validityfor the CAVS was conducted with the ISM and the two scales are correlated (p<.05).

Keywords: *Volition, Self-efficacy Enhancement, Negative-based Incentives, Stress-reducing Actions, Motivation, Volitional Strategies*

When students are confronted by difficult situation in academic context, they use different strategic methods like listening to music, thinking of a reward for themselves once they finish an assignment, or reminding themselves. These strategies help them become motivated and eager to finish a specific task. These methods that the students use are called academic volition. The concept of academic volition deals with how students maintain their motivation in studying and how to regulate their emotion when dealing with difficult situation (Corno, 1993; Corno&Kanfer, 1993; Heckhausen&Kuhl, 1985; Kuhl, 1985).

Academic Volitional Strategies were first developed by Kuhl (1985). He gathered different strategies and administered the scale to college students to examine if they use any of the proposed strategies. The scale is also intended to discover new possible strategies of college students in managing their motivation and emotion in academic situation. In the scale, the students will first indicate whether they used any of the listed strategies by checking *"yes"* or *"no"*. If they check *"yes"*, the students will have to rate the strategies on a five-point scale *(1-I almost never do this and 5-I almost always do this)*. In case there are strategies that are not included, at the end of the scale, the students are obliged to list down all the strategies that they use to combat distractions while doing academic tasks. After administering the 22-item scale, 12 additional strategies are discovered and the term Academic Volitional Strategy Inventory (AVSI) was coined.

The study of Academic Volitional Strategies took different paths. The initial version was developed by Corno and Kanfer (1993). In their study of AVSI, two subconstructs were developed namely *Motivation Regulation* and *Emotion Regulation*.However, Bembenutty and Wolters (2000) noticed that having two subconstructs are not sufficient to show the distinctiveness of the 30 strategies. That observation gave Bembenutty and Wolfers (2000) the idea of dividing the 30 strategies into eight subconstructs namely *self-talk, negative consequences, concentration strategies, socializing strategies, self-reinforcement, and self-encouragement, taking breaks,* and *relaxing music*. They used Exploratory Factor Analysis (EFA) in grouping the 30 strategies into eight subconstructs.

Mccan and Garcia (2000) studied the eight subconstructs and they spotted strong similarities across the eight. This paved the way for the development of the latest version of the AVSI. The eight subconstructs were narrowed down into three succinct subconstructs namely *self-efficacy enhancement, stress reducing actions,* and *negative-based incentives*. Same with what Bembenutty and Kanfer (2000), they also utilized Exploratory Factor Analysis (EFA) to narrow down the eight subconstructs into three. Self-efficacy Enhancement consists of items that will motivate the students by reminding oneself about the goal that they have set for themselves. Stress Reducing Actions is about how students alleviate or eradicate the stress that they are experiencing. Lastly, Negative-based Incentives is made up of consequences that the students think to maintain their motivation to study (Mccan& Garcia, 2000).

There are subsequent studies that measured volition across different areas. In the study of Dewitte (2000), he discovered that not all students need to use volitional control in order to perform well. The types students who do not need volitional strategy are as follows: First, students who enjoyed solving word anagrams have a longer persistence when they utilize no volitional strategy. Second, students who are naturally gifted will continue studying for a while without having to exert volitional control. Lastly, students who are conscientious and have a strong study habits will still perform satisfactorily even without the use of volitional control. To encapsulate Dewitte`s (2000) study, he argued that a low volitional scores do not constitute to bad academic habits. There are some students who do not need frequent use of volitional control because they are either gifted, interested, or have established the right study habits.

On the other hand, Elbe (2004) applied Volitional Components Questionnaire (VCQ II; Kuhl&Fuhrmann, 1998) to measure the development of volitional skills among young elite athlete students. In her study, she argued that volition is especially important for surviving long and intense training loads during the course of an athletic career or for keeping up regular exercising. Therefore, volition does not only deal with academic tasks. It is also applicable to other aspects such as athletics.

In the study of Novak (2014), volition was integrated with motivation to examine the factors that affect human performance in a simulation-based learning environment. Since digital learning is now one of the emerging trends in education, Novak studied how students utilize volition and motivation to improve their performance in a digital learning environment.

The study of Mccan and Garcia (2000) developed the AVSI for high school students. Items of the three factors of volition scale are made applicable for college students in the present study. The first goal of the study is to determine whether the aforementioned three-factor model of volition is suitable for Filipino college students after more than a decade after it was developed.

The previous study by Mccan and Garcia (2000) utilized Exploratory Factor Analysis to determine the number of subconstructsin academic volition. There were three subconstructs that were determined using EFA in the most recent development of the model. In this present study, Confirmatory Factor Analysis was used to verify if the factors proposed by Mccan and Garcia (2000) are supported and applicable in the Philippine educational setting.

The volition scale has been correlated with other constructs such as Action-Control (Kuhl, 1986), the Negative Mood Regulation Scale (Catanzaro &Mearns, 1990), the Rosenberg Self-Esteem Scale (1965), and the effort subscale of the MSLQ (Pintrich, et al., 1991) to establish its concurrent validity. These other constructs are theoretically consistent with the framework articulated by Kuhl (1986). However, the nature of volitional strategies is to maintain the learners' motivation in doing tasks even when confronted by difficulty (Corno & Kanfer, 1993), thus, the present study establishes further the concurrent validity of volition by correlating it with motivation. There is evidence in previous studies on the theoretical consistency between volition and motivation. There are myriad of studies that can prove that volition can be correlated with motivation. One of the studies was conducted by Nagelsmith, Bryer, and Yan (2012). They identified the interrelationships between motivation, volition, and academic success for adult nursing students learning outside of the traditional classroom environment.Furthermore, the validity of Motivated Strategies for Learning Questionnaire (MSLQ) and Academic Volitional Strategies Inventory (AVSI) was examined in their study.Another study that established the correlation between motivation and volition was that of Reid (2005) where she measures the two major constructs in the context of children that suffer from cerebral palsy. Reid utilized Pediatric Volitional Questionaire (PVQ) and Test of Playfulness (TOP) to examine 16 children.

The motivational framework used in the present study is by McInerney (2004). His study of motivation focuses on how the construct works in academic context specifically on the motivated behaviors that the students possess. In a similar way volition is also used in an academic context. The Inventory of School Motivation

(McInerney, 2004) has eight subconstructs namely: *Task, Effort, Competition, Social Power, Affiliation, Social Concern, Praise, and Token.* He gives emphasis to these subconstructs because McInerny argues that motivation should not be viewed as unidimensional but rather as multidimensional (McInerney, Marsh, & Yeung, 2003).

One of the goals of the present study is to determine whether volition increases with motivation to establish its concurrent validity. Also, the researchers are aiming to determine the reliability of items through its internal consistency. Lastly, the factorial validity of the volition will be established against a one factor model using Confirmatory Factor Analysis.

Method

Participants

The participants in the study are 300 college students in a private university in Manila.The students belong in Sports and Wellness Management, Accountancy, Education, Engineering, Information and Technology, and Pharmacy program. There are 150 males and 150 females ranging from 16 to 25 years old. They were chosen using a random sampling technique.

Instrument

A scale was constructed to measure the volitional strategies of Filipino college students. The factors of the scale were anchored on Mccan and Garcia's (2000) latest version of Academic Volitional Strategy Inventory (AVSI). The model is composed of three subconstructs namely *self-efficacy enhancement, stress reducing actions,* and *negative-based incentives.*

The 30 items in this scale were written based on the definitions of the subconstructs. The first 10 items were under self-efficacy enhancement. These items are about how students use positive thoughts to motivate themselves do a specific task (e. g. *I tell myself that I can do any school work, I think about the goals that I have set for myself*). The second 10 items were anchored on stress reducing actions. It is about the techniques that the students perform to eradicate the stress that they have in academic context (e.g. *I count one to ten when I cannot get myself to study, I play music to relax myself when studying*). The last 10 items were based on negative-based incentives. These are items that deal with how students think of negative consequences in order to come up with a positive outcome (e.g. *I think about how disappointed others will be if I do poorly in school, I think about the kinds of job I may end up if I flunk a specific subject*).

Each factor of the volition scale is composed of 10 items that exemplify different techniques that the students perform to maintain their vigor in doing their academic tasks. The volition scale made use of five-point Lickert scale (1-never, 2-seldom, 3-sometimes, 4-often, 5-always) to answer each item. The items were reviewed and were given feedback by an expert in assessment of student learning and that was our basis in revising the items that are included in the volition scale.

Procedure

The volition scale that the researchers developed and the Inventory of School Motivation by McInerney (2004) were administered to the students of National University-Manila. Before administering the scales, the researchers informed the students about the nature of the study and the areas that the items intend to measure. The researchers also asked for the respondent's consent if they are willing to participate in the study.

The proctors of the examination are three of the six researchers. The scales were distributed to each of the respondents. The instruction in answering the scales was indicated on the scales and was explained verbally to the participants. They were also informed to provide response on all items of the two scales. They took the scale for 45 minutes in National University-main building, Room 302. The respondents entered the room by batch, 50 respondents per batch. They were reminded that the two scales was administered to know the volitional and motivational strategies that college students use while they are studying and the degree of frequency of their usage.

Data Analysis

The responses on the two scales were tabulated using a spreadsheet. The data collected were used to determine the descriptive statistics and to determine the validity and reliability of the volition scale. For the descriptive statistics, means, standard deviation, kurtosis, skewness, confidence interval were obtained.

For the test of reliability, the Cronbach's alpha was obtained to establish the internal consistency of the items.

To test the validity `of the scale, the researchers utilized content validity in which items were examined and revised with the help of an expert; Convergent validity was conducted in which the three factors of the scale were correlated to each other; Concurrent validity was tested by intercorrelating the factors of the scale and the factors of ISM;Factorial validity of the scale was determined using Confirmatory Factor Analysis (CFA). The researchers were able to prove the factor structure of volition in the CFA using Joreskog GFI, Bentler-Bonett Normed Fit Index, Bentler-Bonett Non-Normed Fit Index, Bentler Comparative Fit Index, James-Mulaik-Brett Parsimonious Fit Index, Bollen's Rho and Bollen's Delta as fit indices.

Results

To test the reliability of the volition scale the Cronbach's alpha of the whole scale and its factors were obtained. The value of the coefficient alpha indicated the internal consistency of the volition items. The concurrent and convergent validity of the scale was assessed by intercorrelating volition factors to itself and to the factors of ISM. The factorial validity was established by testing two measurement models using CFA.

Table 1
Descriptive Statistics for Volition and Motivation

Domain	M	SD	Kurtosis	Skewness	C+	C-
CAVS						
Self-efficacy	3.84	0.38	0.78	0.54	3.89	3.80
Negative-based incentives	3.92	0.38	0.6	-0.1	3.96	3.87
Stress-reducing actions	3.83	0.43	2.2	-1.1	3.88	3.78
ISM						
Task	4.23	0.44	0.2	-0.75	4.28	4.18
Effort	4.23	0.43	0.5	-0.8	4.28	4.18
Competition	3.94	0.51	0.3	-0.4	4.00	3.88
Social power	3.93	0.59	-0.12	-0.39	4.00	3.86
Affiliation	3.7	0.78	-0.63	-0.33	3.78	3.60
Social concern	3.95	0.52	0.12	-0.53	4.01	3.89
Praise	4.02	0.51	-0.62	-0.38	4.08	3.97
Token	3.6	0.6	0.1	0.0006	3.66	3.52

The means of the factors of the volition scale are 3.84, 3.92, and 3.83 which means that most of the respondents close to 4.00 on the three subscales. On the motivation scale the means of the factors are 4.23, 4.23, 3.94, 3.93, 3.7, 3.95, 4.02 and 3.6 which is an indication that most of the respondents answered close to 5 on the eight subscales. Among all the factors of the volition and motivation scale's standard deviation, only *affiliation* got a value greater than 0.70 which means that the scores of the respondents on that factor are widely dispersed. All the factors are close to normal distribution.

Table 2
Internal Consistency of Items (CAVS)

Domain	Cronbach's Alpha
Whole Scale	0.41
Self-efficacy Enhancement	0.45
Stress-reducing Actions	0.45
Negative-based Incentives	0.46

The reliability of the scale was determined by obtaining the Cronbach's alpha values of the whole scale and its three factors. The obtained value of 0.41 for the whole scale indicated adequate internal consistency which means that there is a consistency of responses on the items of CAVSI. The alpha value of 0.45 for self-efficacy, 0.46 for stress-reducing actions and 0.45 for negative-based actions also indicated internal consistency.

Table 3
Intercorrelation of Subconstructs(CAVS and ISM)

Domain	Task	Effort	Compe-tition	Social power	Affilia-tion	Social concern	Praise	Token
Self-efficacy Enhancement	.09	.15*	.13*	.01	-.17*	-.02	-.25*	.04
Stress-reducing actions	-.12*	.02	-.12*	.18*	.11*	.01	.24*	.05
Negative-based Actions	.14*	-.07	.19*	.16*	.02	.02	.00	-.05

*p<.05

Using zero-order correlations, the factors of CAVS and ISM were intercorrelated at 95%confidence interval and the results indicated the significant correlation between some factors. The volition factor self-efficacy enhancement are significantly correlated with effort, competition, affiliation and praise; stress-reducing actions are significantly correlated with task, social power, affiliation and praise; and negative-based incentives are correlated with task, competition and social power. All the correlations are positive except the correlation between self-efficacy and affiliation; self-efficacy and praise; and stress-reducing actions and tasks.

Table 4
Intercorrelation of Subconstructs (CAVS)

Domain	Self-efficacy	Stress-reducing Actions	Negative-based Actions
Self-efficacy			
Stress-reducing Actions	-0.06		
Negative-based actions	0.04	-0.00	

*p<.05

For the test of convergence on the factors of CAVSI at confidence interval of 95%, all the three factors: self-efficacy, stress-reducing actions and negative-based incentives obtained p values greater than 0.05 which means that there is no correlation among all the three factors. However, their convergence will be further tested as latent variables in the Confirmatory Factor Analysis.

Table 7
Fit indices of the Different Measurement Models

Goodness of fit indices	3-factor model	1-factor model
Joreskog GFI	0.930	0.836
Joreskog AGFI	0.879	0.812
Bentler-Bonett (1980) Normed Fit Index	0.707	00.317
Bentler-Bonett Non-Normed Fit Index	0.804	0.405
Bentler Comparative Fit Index	0.879	0.446
James-Mulaik-Brett Parsimonious Fit Index	0.439	0.295
Bollen's Rho	0.528	0.266
Bollen's Delta	0.899	0.465

To test the factorial validity of the College Academic Volition Scale three-factor model and one-factor model was tested using CFA. The Ordinary Least Square approach was used. The usual General Linear Model is not applicable since the covariance matrix was singular. Ordinary Least Square is one of the method used in making prediction and estimation. It can be used to analyze the relationships among factors in a CFA approach. Researchers usually use OLS in correlation analysis in which also can be performed using SEM (Hair et al., 2006). The OLS has minimum demands in fitting the three factor model as compared to the SEM approach in the CFA.

For the three-factor model using the OLS approach, the obtained values on the four fit indices Bollen's data, Bentler Comparative Fit Index, Joreskog AGFI and Joreskog GFI are greater than 0.90 which is an indication that the three-factor model is in good fit. On the other hand, all the obtained values of the one-factor model on all fit indices are below 0.90 which means that the two factor model is not in good fit

A two factor model was also tested using the General Linear Model. The measurement model utilized volition and motivation as its latent factors to determine the theoretical consistency of the two factors. The manifest variables used here are their respective subfactors. After using CFA, the obtained values are: 0.923 for Joreskog GFI, 0.95 for Population Gamma Index, 0.08 for RMS, 0.85 for McDonald's Index of Noncentrality, 0.58 for Bentler-Bonett Normed Fit Index, 0.36 for Bollen's Rho, 0.59 for Bollens'Delta and 0.09 for RMSEA. Among all the obtained values three passed the estimate required; both the obtained value on Joreskog GFI and Population gamma Index are greater than 0.90 and the obtained value on RMS is part of the interval 0.80 and below, which is an indication that the two-factor measure model is in good fit.
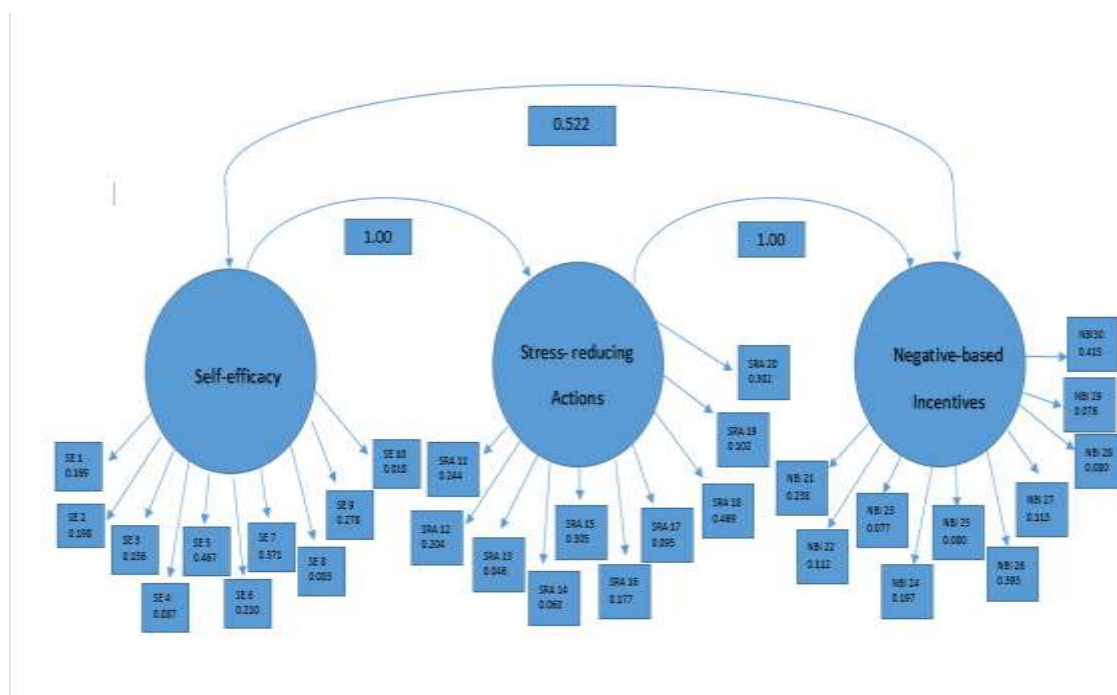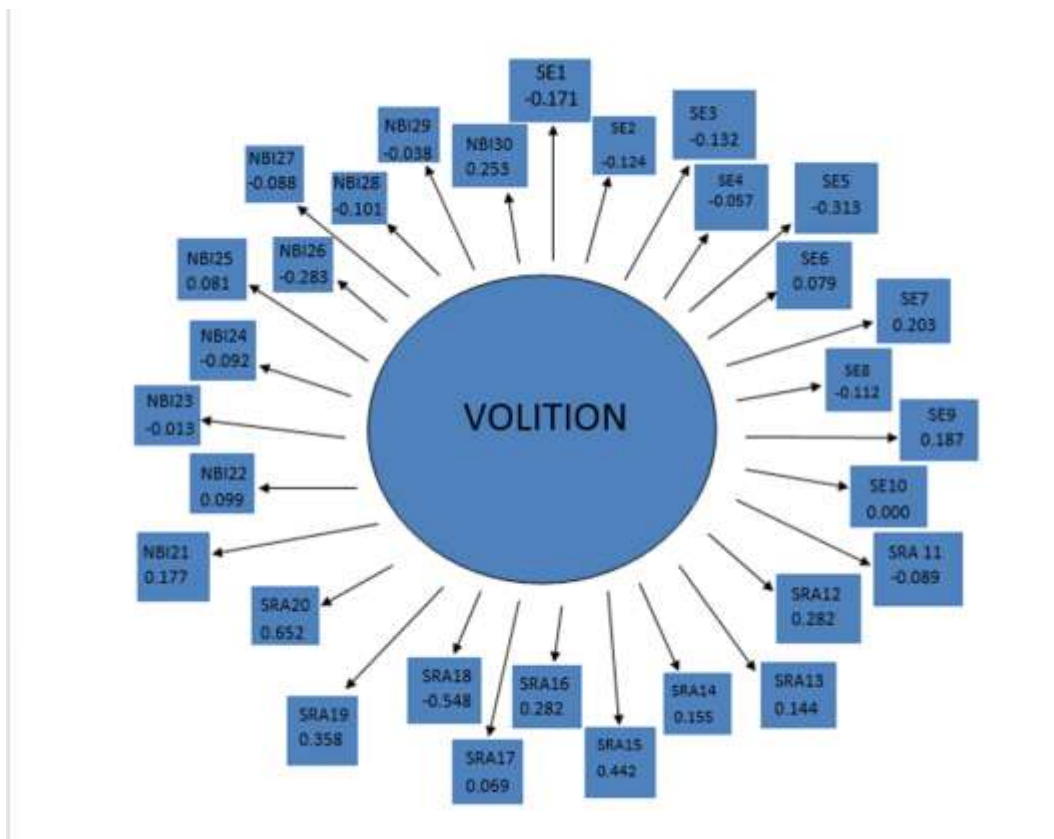

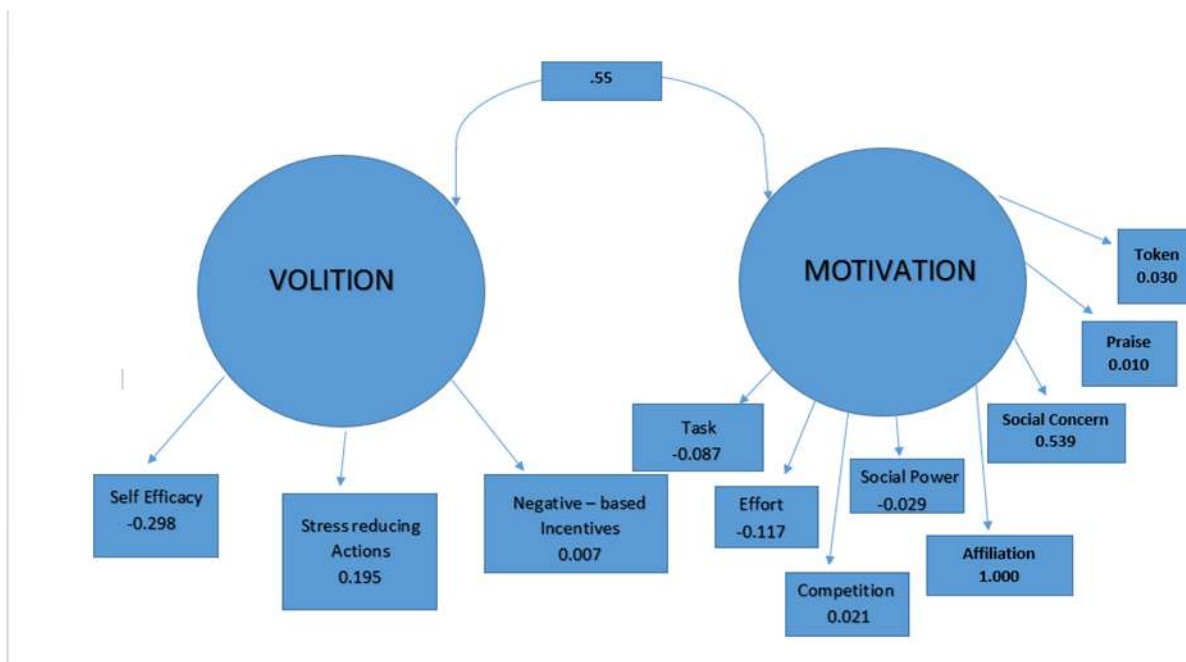
Figure 1. Three-factor Model

Figure 2. One-factor Model

Figure 3. Two-factor Model

Discussion

The main purpose of the study is to develop a scale that will determine the volitional strategies that Filipino college students utilize to combat distractions, demotivation, and disinterest in academic context. Using the Cronbach's alpha, the researchers tested the reliability of CAVS; it was shown that the items of the scale and its subscales are internally consistent. It has also been found that the three factors of the scale are not correlated to each other but significantly correlated with some of the factors of the ISM. The Confirmatory Factor Analysis solidified the claim that the three-factor model is the best model for the scale.

The study found that the volition scale is reliable. The internal consistency of the whole scale and all its subscales is a good indication that there is homogeneity on the items of the whole scale and each subscale. Compared to the Cronbach's alphas on the present study, the values obtained in the previous study by Mccan and Garcia (2000) are much greater. For factor self-efficacy enhancement, the alpha 0.82 is greater than 0.45; for factor stress-reducing actions, the alpha 0.69 is greater than 0.45; and for factor negative-based incentives the alpha 0.73 is greater than 0.46. The discrepancy between the alpha values on the two studies is can be explained due to the fact that the participants in the present study came from six different programs: 256 from BS Sports and Wellness Management, 26 from BS Accountancy, nine from BS Education, five from BS Civil Engineering; 2 from BS Information Technology and two from BS Pharmacy; as compared to the previous study where all respondents are from the same program of studies. The discrepancy accounts to the difference in methodology that the two study used. In terms of the sampling technique, both studies used random sampling, however, the samples gathered on the previous study belongs to only one strata which indicates that the previous study used sample from one subpopulation while the present study used samples from different subpopulations. Also, the sample on the previous study were controlled with variable course research requirement and that might affected the similarity on the way they answer the items on AVSI.

The concurrent validity of the volition factors with the factors of ISM waspartially established. Results showed that the volition factor self-efficacy enhancement has a negligible relationship with effort and competition; the volition factor stress-reducing actions has a negligible to low relationship with social power, affiliation and praise; and the volition factor negative-based incentives has a negligible relationship with task, competition and social power. The present study implies that when students use strategies that enhances their esteem towards productivity (*self-efficacy enhancement*), the willingness to expend effort (*effort*) and the competitiveness in learning (*competition*) are maintained; when students make efforts to relax or take breaks (*stress-reducing actions*), the seeking status for leadership (*social power*), the feeling of belongingness to a group (*affiliation*) and seeking for social recognition (*praise*) will be preserved; and when students think of the negative consequences of failing (*negative-based incentives*), the interest in the task (*task*), the competitiveness in learning (*competition*) and the seeking status for leadership will remain. Meanwhile, the r values obtained on the previous study by Mccan et al (1998) where volition control was correlated with four motivation factors:

intrinsic goal orientation, task value, self-efficacy and test anxiety are greater than the r values on the present values. The r values of the factors of volition with motivation are 0.48 with intrinsic goal orientation, 0.44 with task value; .54 with self-efficacy and -0.19 with test anxiety. The substantial relationship among the volition factors and motivation factors supports the claim in the present study that volition and motivation are two correlated subconstructs. No explanation

The validity of the volition scale was further established by comparing the three-factor model with the one-factor model of the volition scale. Results showed that the three-factor model is the best model for the volition scale since it passed on more than three fit indices, compared to the one-factor model which did not passed any fit index. Even if the factors are notsignificantly correlated in the zero-order correlation, the CFA showed that each of the factor of volition accounts for each other and the three factors showed acceptable fit. On the current version of AVSI, Mccan and Garcia (2000) used Exploratory Factor Analysis to prove that factors self-efficacy enhancement, stress-reducing actions and negative-based incentives clearly divides the 30 strategies, and since the present study have proven the validity of the model, the three-factor solution that was offered as the empirically-based taxonomy of the volition scale was accepted. The study implies that three factors is enough to establish the distinctiveness of the 30 strategies of the scale.

With the use of CFA, it was shown that two-factor model which utilized motivation and volition as its latent factors is in good fit. This means that the items on each scales do not overlap, indicating that the items of CAVS do not measure factors and subfactors of ISM. This concurrent validity was expected due to the fact that Mccan and Garcia (2000) devised AVSI to assess how college students manage emotion and motivation during the goal striving process. Moreover, the goodness of fit of the two-factor model affirms the ideas of Zhu (2004) who asserted about the distinction between volition and motivation and the linear relationship that the two have. The present study provides a proof to the theoretical idea by Kuhl (1987) who purported that motivation only impacts the intention to act, whereas volition keeps one focused with intentions, through the correlation established using the two-factor model. Generally, the present study do not only prove that volition and motivation are two different constructs but also affirms the relationship that they have.

The theoretical contribution of the study is focused on the significant relationship between volition and motivation which was established for the volition scale's concurrent validity. One of the purpose of this paper is to give a theoretical proof on the claim that volition maintains motivation during the goal-striving process; and it was successfully done through the correlations found among the factors of the volition and motivation scale. The goodness of fit of the two-factor model is also a manifestation that the study of Garcia et al (1998) which said that volitional strategies support the impact of motivational processes is true since it indicates that the two constructs are not just distinct but also correlated to each other. Furthermore, the present study from affirming the relationship between the two also supports the ideas proposed on the studies (Corno&Kanfer, 1993; Heckhausen&Kuhl, 1985; Kuhl, 1985) about the influential role volition when motivation have decreased when students are confronted with frustrations with course work requirements, disinterest or personal problems. Generally, the present study suggests volitional

strategies are used to maintain motivation and without volition the pursuit to fulfill an academic task would be difficult for students.

The present study was successful in creating a volition scale that is applicable for Filipino college students. Since the scale is reliable, it means that there is a similarity on how students answer the items of the whole scale and the items of each of the three subscale which is a good indication that the scale is applicable to Filipino college students. The scale is also valid which means that the whole scale really measures volitional strategies and the three subscale measures the subconstruct that it purports to measure.

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