"It Is Important to me to Do Well in School": Validating the Academic Self-Regulation Questionnaire in an Asian context

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Abstract
The Academic Self-Regulation Questionnaire (A-SRQ) was developed to determine how students are motivated in academic related activities. This scale was validated in the US and Germany but no similar efforts were carried out in an Asian context. In an attempt to validate this questionnaire and understand how students in a developing Asian country regulate their academic behavior, a study was conducted among 511 secondary school students in the northern region of Malaysia. This study revealed that in general, the factors proposed by the original authors of the A-SRQ – intrinsic motivation, identified regulation (factors for Autonomous Regulation), introjected regulation and external regulation (factors for Controlled Regulation) – applied to the current sample. Though the original four factors applied to our sample, factor analyses on our data revealed four different factors that better explain the behavior of our sample. We propose that these factors are responsibility, approval seeking, intrinsic motivation and chastisement. The new factor, Responsibility, alone explained more variance than Controlled Regulation in a regression model that predicts academic achievement after controlling for memory span and reasoning skills. We therefore conclude that the A-SRQ is a valid tool to measure self-regulation behavior in academic settings among Asian students. However, we propose that factors for explaining their academic regulation behavior should be modified according to cultural characteristics.

Introduction

Self-regulation refers to planned behavior that directs all efforts, thoughts and feelings to achieve one's goals (Zimmerman, 2000). Self-regulation is not a single trait that an individual may possess or lack, but it is a skill that involves selecting specific processes or behavior such as adopting strategies, self-monitoring and evaluation of progress, time management and attributing causation to results that will lead to achieving specific goals (Zimmerman, 2002). Numerous studies have shown the importance of self-regulation in achieving goals in weight loss programs (Gokee-LaRose, Gorin & Wing, 2009), health promoting behavior (Bandura, 2005; Mann, de Ridder & Fujita, 2013) and academic attainment (Schunk, 1983; Schunk & Zimmerman, 1994; Zimmerman, 2001).

Academic attainment has been established to be a significant predictor of life achievements and success (Sewell & Hauser, 1975; Abbott-Chapman et al., 2014). Students as well as their parents are particularly concerned about academic achievement as they see it as an avenue to economic success and a better life. This is even more so in Asian cultures. Academic success is not only a means to a better life, but it is also an act of filial piety and family honoring on the children's part in most if not all Asian cultures (Hsu, 1971; Hao & Bonstead-Bruns, 1998). Studies by Crystal and colleagues1(994) as well as Peng and Wright (1994) reported higher academic achievement among Asian American students compared to their native counterparts of European and African heritage. Hence, it will be enlightening to see how students in an Asian context differ in their view and efforts in attaining academic success compared to their counterparts in Western societies such as America and Europe. Perhaps there are no differences, and there may be just universal values that apply to all students as they set off to attain their academic goals.

Ryan and Connell (1989) designed a questionnaire to examine various possible reasons that motivate students in their academic behavior. They proposed that these reasons could stem from the self or the environment. According to their view, there are two types of regulatory methods – controlled and autonomous. Controlled regulatory efforts refer to behavior motivated by external rewards, rule compliance, approval seeking and punishment avoidance. Autonomous regulatory behaviors are motivated by values that are deemed personally important and genuine interest towards that particular behavior or goal. The authors further specified controlled regulatory style to external regulation and introjected regulation and autonomous regulatory style to identification regulation and intrinsic motivation.

The questionnaire designed by Ryan and Connell (1989) had four major sections headed by the following questions:

- Why do I do my homework?
- Why do I work on my classwork?
- Why do I try to answer hard questions in class?
- Why do I try to do well in school?

There are 7-9 items in each section followed by four answer options – strongly disagree, disagree, agree and strongly agree. Respondents select the answer that best represents the reason for the behavior described at the beginning of the section.

The current study aims to investigate self-regulatory methods among students in Malaysia using the A-SRQ and determine the validity of the original A-SRQ factors in an Asian population. We also seek to identify differences and/or similarities in self-regulatory methods between Western and Eastern cultures. Finally, we are interested in determining if any of the A-SRQ factors predict academic achievement among students in Malaysia.

Methods

Respondents in the current study were recruited from six secondary schools in northern Malaysia (states of Penang and Kedah). Data collection was done in two phases. In the first phase, self-report questionnaires were administered in classrooms with permission and co-operation from the school management. The questionnaires are the A-SRQ (Ryan & Connell, 1989), the Behavioral Inhibition System and Behavioral Activation System (BIS-BAS) (Carver & White, 1994), and the Malay language (*Bahasa Malaysia*) version of Motivation and Strategies for Learning Questionnaire (MSLQ) (Ng et al., 2005). For the A-SRQ and BIS-BAS, the original versions in English were modified to include the *Bahasa Malaysia* equivalent for each item; hence, these questionnaires were bi-lingual. Participants also filled out a demographic questionnaire where they reported information such as gender, which stream (liberal arts or science) they are currently in and their results of the national standardized exam "*Penilaian Menengah Rendah*" from the previous year.

At the completion of phase one, students were briefed on the procedures of phase two. Those who were interested in phase two signed up to complete a computerized task of memory recall (Color Span in the Brain Twister by Buschkuehl, Jaeggi, Kobel & Perrig, 2007) and the Kaufman Brief Intelligence Test Second Edition (K-BIT II) (Kaufman & Kaufman, 2004) for reasoning skills. There were 96 students who participated in phase two.

Data collected was analyzed using multiple regression techniques and exploratory factor analysis.

Results

There were 511 students (52% males; 48% females) who participated in the self-report questionnaire phase of the study. These are students in the fourth year of their secondary school education (Form 4) or the tenth year of formal education in Malaysia.

The descriptive statistics of the sample and variables are presented in Table 1. The reliability (Cronbach's α) of the A-SRQ is 0.92.

	Minimum	Maximum	Mean	Std. Deviation
External Reg.	10.00	36.00	26.74	4.67

Introjected Reg.	9.00	36.00	26.04	5.23
Identified Reg.	9.00	28.00	22.62	3.88
Intrinsic Motivation	7.00	28.00	19.29	4.40
Controlled Reg.	9.50	36.00	26.39	4.67
Autonomous Reg.	8.00	28.00	20.96	3.74

Table 1: Descriptive statistics of the four original factors (external regulation, introjected regulation, identified regulation and intrinsic motivation) of the Academic Self-Regulation Questionnaire obtained from the current sample. Controlled Regulation is the averaged score of external regulation and introjected regulation. Autonomous Regulation is the averaged of identified regulation and intrinsic motivation.

When the raw scores in Table 1 were converted to percentage, respondents in the current sample had a rating of 73.3% on the controlled regulatory style and 74.8% on the autonomous regulatory style. This suggests that the students in our sample do not favor one style over the other – controlled or autonomous.

Exploratory factor analysis was conducted to investigate whether our current sample would exhibit four different kinds of regulatory behavior as suggested by Ryan and Connell (1989). Exploratory factor analysis (EFA) is a statistical technique employed to identify underlying relationships among measured variables. In this study, principal axis factoring was used in which the first factor extracted accounts for the most variance in the dataset, the second factor accounts for the second most variance and so forth. This extraction method is descriptive – it merely explains variance in the current sample and therefore, the factors or results should not be generalized beyond that specific sample. The factors extracted from the dataset are then subjected to an oblique rotation instead of an orthogonal rotation for interpretation. Oblique rotation is more advantageous as the factors extracted are allowed to correlate; hence, a simpler and more parsimonious explanation as well as correlation estimates among factors could be obtained from such rotation.

Results from EFA on our current datasets suggest four factors, and we named them Responsibility, Approval Seeking, Intrinsic Motivation and Chastisement. See Table 2 for the list of items that loaded on each of these factors.

	Because it's important to me to try to do well in school
	Because that's what I'm supposed to do
	Because it's important to me to try to answer hard questions in class

Factor 1: Responsibility	Because it's important to me to do my homework
	Because that's what I'm supposed to do
	Because it's important to me to work on my class work
	To find out if I'm right or wrong
	Because I will feel really bad about myself if I don't do well
	Because I want to understand the subject
	Because that's what I'm supposed to do
Factor 2: Approval Seeking	Because I want the teacher to say nice things about me
	Because I want the other students to think I'm smart
	Because I might get a reward if I do well
	Because I want the teacher to think I'm a good student
	So my teachers will think I'm a good student
	Because I want the teacher to think I'm a good student
	Because I will feel really proud of myself if I do well
Factor 3: Intrinsic Motivation	Because it's fun (to work on my class work)
	Because it's fun (to do my homework)
	Because I enjoy doing my homework
	Because I enjoy doing my class work
	Because I enjoy doing my school work well
	Because I want to learn new things
	Because it's fun to answer hard questions
	Because I enjoy answering hard questions
Factor 4: Chastisement	Because I'll get in trouble if I don't (do my homework)
	Because I will get in trouble if I don't do well
	Because I'll feel bad about myself if I don't do it (homework)
	Because I'll be ashamed of myself if it didn't get done (class work)
	So that the teacher won't yell at me

Table 2: The list of items that loaded on the respective factors obtained from exploratory factor analysis (EFA) on the current sample.

Table 3 presents the means and standard deviations (SD) for each of the new factor obtained from our EFA. Descriptive statistics for five factors were reported instead of the "four new factors" mentioned previously. This is because factor 4 only had two items (*because it's fun to answer hard questions*; *because I enjoy answering hard questions*). Since these two items and the six items from factor 3 all matched items on the Intrinsic Motivation from the original A-SRQ factors, these two factors were combined together as one factor and also named as Intrinsic Motivation in this current study.

	Minimum	Maximum	Mean	Std. Deviation
Responsibility	12	40	32.06	5.54

Approval Seeking	7	28	18.86	4.89
FACTOR3	6	24	17.18	3.99
FACTOR4	2	8	5.53	1.63
Chastisement	5	20	15.32	3.07

Table 3: Descriptive statistics of the factors obtained from exploratory factor analysis (EFA) on the current sample.

Regression analyses were then conducted to determine if any of the original A-SRQ factors or the new factors obtained from the current sample predicted academic achievement among our respondents. There were a total of 96 students who participated in phase two, where they completed the memory span (mean = 7.83; SD = 1.44) and reasoning skills (mean = 38.8; SD = 5.53) tasks. The maximum score possible for the memory span and reasoning skills tasks were 12 and 45 respectively.

Academic achievement was operationalized using respondents' results on the national lower secondary national standardized examination that they sat for the previous year. This self-report measure served as the outcome variable in the regression analyses with the following predictors: memory span, reasoning skills, controlled regulation, autonomous regulation and all five factors obtained from EFA on the current sample. Results from the first regression analysis presented in Table 4 suggested that only memory, controlled regulation, factors 1 (responsibility), 2 (approval seeking) and 5 (chastisement) significantly predicted academic achievement. This model explained about 40% of the total variance in the dataset.

	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	Std. Error	Beta	
(Constant)	-17.529	7.043		.015
Memory	1.332	.530	.260	.014
Reasoning	.221	.141	.167	.123
Controlled Reg	-3.281	1.272	-2.176	.012
Autonomous Reg	-2.493	1.691	-1.421	.144
FACTOR1 (Responsibility)	1.915	.788	1.555	.017
FACTOR2 (Approval Seeking)	1.786	.666	1.202	.009
FACTOR3	1.241	.826	.737	.137
FACTOR4	2.114	1.051	.550	.048
FACTOR5 (Chastisement)	2.095	.751	1.025	.007

Dependent Variable: Academic Achievement (PMR.Score); R-squared = 0.41

Table 4: Regression model with predictors Memory, Reasoning skills, Controlled Regulation, Autonomous Regulation, Factors 1, 2, 3, 4 and 5 obtained from exploratory factor analysis (EFA) on the current dataset.

Knowing that memory and reasoning skills are significantly related to academic achievement (Deary et al., 2007), the next two regression analyses were run controlling for memory ability. Since reasoning skills was not a significant predictor as suggested in Table 4, this variable was not included in subsequent analyses.

Regression outcome presented in Tables 5 and 6 suggested that the factor Responsibility explained 8% more variance than controlled regulation in predicting academic achievement after controlling for memory ability.

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	10.824	4.196		.012
	Memory	1.442	.524	.281	.007
2	(Constant)	-6.145	5.791		.292
	Memory	1.790	.494	.349	.000
	Controlled Regulation	.574	.145	.380	.000

R-squared = 0.22

Table 5: Regression model with predictors Memory and Controlled Regulation

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	11.392	4.231		.008
	Memory	1.357	.528	.262	.012

	(Constant)	-10.886	5.452		.049
2	Memory	1.860	.467	.358	.000
	FACTOR1 (Responsibility)	.607	.110	.497	.000

R-squared = 0.30

Table 6: Regression model with predictors Memory and Factor 1 (Responsibility)

Discussion

The current study explored the validity of the Academic Self-Regulation Questionnaire, A-SRQ, by Ryan and Connell (1989) in an Asian context. More than 500 students in northern Malaysia completed the A-SRQ and though the original four factors proposed by Ryan and Connell (1989) seem to apply to the current sample, an exploratory factor analysis (EFA) on the dataset suggested four different factors. The first factor was named Responsibility as the items loaded on this factor carried the theme of personal importance and meeting a sense of expectation. Having a sense of responsibility means that one carries an obligation to fulfil a duty or a task expected of one, and this was reflected in the items that loaded on the first factor. Indeed, many Asian American students reported parents' high expectations on them regarding academic matters (Crystal et al., 1994; Peng & Wright, 1994). Thus, the behavior described by factor 1 or Responsibility in our sample mirrored attitudes and perceptions reported by Asian students although these students participated in an American education system.

Items on the second factor revealed desires of students to gain rewards, positive feedback and seek approval in their efforts to achieve academic success; hence, we deem it appropriate to name the second factor Approval Seeking. Items on factors 3 and 4 corresponded to items of Intrinsic Motivation from the original A-SRQ factors, which described behavior motivated by genuine interest and enjoyment of the very behavior itself. Therefore, these two factors were combined and named Intrinsic Motivation.

Items on factor 5 revealed a tinge of fear and anxiety in response to the negative consequences of not achieving academic goals; hence, we labeled this factor Chastisement.

It is interesting to note the differences and similarities of the new factors obtained from EFA on the current sample compared to the original factors proposed by Ryan and Connell (1989). The original factors clearly separated reasons for behavior that come either from within the self or from the environment outside of the self. Items that form the Controlled Regulation style are reasons motivated by external factors such as approval, rewards and punishment as well as following rules or meeting expectations. On the other hand, the Autonomous Regulation style comprised of reasons motivated by values that are personally important and the desire to have fun or enjoy the activity itself that promote success in academic settings. However, our analyses suggested that such clear delineation of the self and environment does not apply to our sample. The first factor that we recognized as possessing a sense of

responsibility contained items that reflected reasons that are personally significant in addition to an obligatory duty to meet expectations or fulfil some sort of duties externally set upon oneself usually by another.

Items that represented genuine interest and enjoyment formed the same factor, and this factor was the only that matched an original factor of the A-SRQ – Intrinsic Motivation. We propose that perhaps such internal impetus that drives behavior purely on the basis for pleasure and gratification is a universal characteristic of human beings. Maybe meeting obligations or fulfilling responsibilities could differ in various degrees according to cultural expectations, but having fun or the natural desire to want to enjoy things in life might just be an innate trait of what it means to be human.

The current study sought to investigate whether the A-SRQ was a valid tool to determine how students in an Asian context, specifically Malaysia, regulated their behavior in academic settings to achieve goals for success. Results from the current study suggested that students in the current sample regulated their behavior based on reasons or values that are deemed personally important to them and driven by a sense of duty or obligation to do well in school, which they perceived as what they were supposed to do as students or adolescents. This reason (the factor Responsibility) was a stronger predictor of academic achievement than a regulatory style driven primarily by external factors (controlled regulation). We humbly suggest that the factors extracted by EFA on the current sample are appropriate to describe students from an Asian background in their efforts to achieve academic success.

Though these factors may be more appropriate, some limitations of the current study should be clarified. The original factors were obtained from a simplex model instead of the factor analytic approach (Ryan & Connell, 1989). The comparison between original factors and the factors obtained from the current study therefore should be interpreted cautiously. In the current study, we refrained from suggesting accuracy or superiority of one set of factors over the other but we interpreted our results guided by the original factors as a source of reference.

We also suggest that the current EFA results be subjected to a series of confirmatory factor analyses to further determine the validity of the A-SRQ and current results. Furthermore, we acknowledge that the regression analyses conducted in the current sample could be improved with a larger sample size.

All in all, we administered the academic self-regulation questionnaire (Ryan & Connell, 1989) designed in a non-Asian setting in an Asian setting, and we proposed that students in this setting regulate their behavior in academic related goals based on a sense of responsibility, a desire to seek approval, intrinsic motivation and a tendency to avoid punishment or chastisement.

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