Emotional Intelligence and Academic Success among Low Income College Students

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Abstract

Emotional intelligence is the ability to understand and to manage the relationship between emotion, cognition and behavior. It was hypothesized that levels of emotional intelligence are associated with levels of income. Few studies have examined the relationship between emotional intelligence and academic success among low income college students. The purpose of this correlational and comparative research study was to test a hypothesized model about students' income level, emotional intelligence skills, and academic success. Relations between variables associated to academic success were explored using multivariate analysis techniques. The results showed significant direct and/or indirect effects of income level on emotional intelligence and academic success.

Key words: Emotional Intelligence, low-income, academic success and regression analysis

1. Introduction

Emotional intelligence combines emotions and reason (Yelkikalan et al, 2012). According to Salovey and Mayer (1993), emotional intelligence is being able to monitor one's feelings and/or the feelings and emotions of others, to discriminate among them, and to use the acquired skills to guide one's thinking and actions. Those who possess emotional intelligence are noted to be skilled in four areas: identifying, using, understanding, and regulating emotions (Mayer & Salovey, 1993). Additionally, as stated by Goleman (1995) those that possess emotional intelligence also have the tendency to contain other components which include: knowing one's emotions (self-awareness), managing them, motivating self, recognizing emotions in others (empathy), and handling relationships. According to Maraichelvi and Rajan (2013), when emotional intelligence skills are the focus of learning, students are building human development behaviors that are complexly related to the positive outcomes of achievement, goal achievement and personal well-being.

Various investigators (Preeti, 2013; Parker, et al., 2003; Jaeger, 2003; Nwabuebo, 2013; & Preeti, 2013) have engaged in research designed to examine emotional intelligence constructs within academic settings for the purpose of measuring academic success. A research study conducted by Fernandez, Salamonson and Griffiths (2012) found that acquiring emotional intelligence skills were key factors in the academic achievement and test performance of high school and college students. In a similar study, Roy, Sinha, and Suman, (2013) reported emotional intelligence as a significant predictors of academic success. Another study conducted by Fernandez, Salamonson and Griffiths (2012) discovered that various emotional and social competencies were strong predictors of academic success.

Similarly, a number of studies have explored the predictive effects of emotional intelligence an academic achievement (Hafiz, 2011). For example, Yelkikalan et al. (2012) studied the effects of emotional intelligence instruction on academic performance and found that a significant correlation exists between the emotional intelligence and academic performance. Similarly, Preeti (2013) in their investigation noted that advanced emotional intelligence was correlated with greater individual performance, often above and beyond that associated with one's level of general intelligence. Moreover, Maraichelvi and Rajan (2013), reported that a positive relationship existed between emotional intelligence and academic achievement. What is more, in a similar study, Tariq, Majoka and Hussain (2011), researched female and male university students regarding emotional intelligence and found that although there was a great difference between perceptions of female and male students, male students believe that they were more superior in factors of emotional intelligence, compared to their female counterparts.

While emotional intelligence is an important element of academic success when developed and well employed (Six Second Emotional Intelligence Network, 2013); it is not, in itself, sufficient to create optimal outcomes for every young student (Maraichelvi & Rajan, 2013). Yelkikalan et al. (2012) suggested that any investigation of the potential effects of emotional intelligence on academic performance must be pursued in a specific context. Although, a number of studies have sought to explore the relationship among emotional intelligence and academic success; few studies have sought to provide evidence of the relationship between emotional intelligence and academic success among students identified from low income backgrounds. "Low-income" is a term tied to the measure of poverty in the United States. The federal government defines an individual or family as low income if their income is twice (or 200 percent of) the federal poverty threshold. The poverty threshold for a family of four in 2009 was 22,050. In 2011, the low-income threshold for a family of four with two children was \$45,622 (U.S. Census Bureau, 2012).

The purpose of this quantitative study was to test the theory of emotional intelligence and its relationship to academic achievement in economically disadvantaged undergraduate students who are at risk for academic success. This was accomplished by testing the following research question; What is the relationship between emotional intelligence factors, and academic success among low income students in the areas of Intrapersonal Skills, Interpersonal Skills, Adaptability, Stress Management Skills And Income. The statistical hypotheses for the study were:

Hypothesis 1: There is a statistically significant relationship between intrapersonal skills and academic success

Hypothesis 2: There is a statistically significant relationship between Interpersonal skills and academic success

Hypothesis 3: There is a statistically significant relationship between adaptability skills and academic success

Hypothesis 4: There is a statistically significant relationship between stress management skills and academic success

Hypothesis 5: There is a statistically significant relationship between Income and academic success

2. Method

The study included 353 students enrolled in a bachelors program at Prairie View A&M University. The sample was randomly selected and data were collected in the spring of 2013. Data for this study contained no identifiable personal information from any of the respondents. The minimum ratio of valid cases to independent variables for multiple regression is 5 to 1. With 353 valid cases and 5 independent variables, the ratio for this analysis is 70.0 to 1, which exceeds the preferred ratio of 20 to 1 requirement (Cohen, 1969; Creswell, 2003; Olejnik, & Algina, 2000).

An adequate sample size with a confidence level of .05, decreases the possibility of committing a type I error (Rom~ao, Delgado & Costa, 2010). To reject the null hypothesis when it is true is to make what is known as a type I error (Rubin & Babbie, 2006). On the other hand, a larger sample with an alpha of .05 increases the power and decreases the chances of committing a type II error, which is failing to reject the null hypothesis when in fact there is a difference (Rubin & Babbie, 2006; Rosenthal, 2001). Prior to data collection a research proposal application was submitted to the Institutional Review Board (IRB) and approval was granted.

All participants completed a questionnaire on emotional intelligence and relevant student demographic information. Next, scores were gathered from each student and comparisons were made. The first comparison determined if the variable Income had a significant relationship with the latent variable, academic success defined by the indicator variable GPA.

The second comparison determined which of the independent variables in the model (Intrapersonal Skills, Interpersonal Skills, Adaptability Skills, Stress Management Skills and Income) were the strongest predictors of academic success.

3. Instrumentation

Study participants were given a questionnaire packet including the The Bar-On Emotional Quotient Inventory (EQ-i) survey and relevant demographic items. The EQ-i is a 133-item self-report instrument developed to measure complex emotional, personal, and interpersonal abilities as they interacted with one another to influence abilities and behaviors, separate from personality traits or cognitive capacity (Bar-On, 2000). The study used the following subscales from the *Quotient Inventory (EQ-i)*: Intrapersonal Skills, Interpersonal Skills, Adaptability Skills and Stress Management Skills. The instrument reported an internal consistency of .97, a 3-month testretest reliability of .79, and a 6-month test-retest reliability of .72 to .80 (Ciesko, 2009; Gravetter, & Wallnau, 2005).

Furthermore, the Quotient Inventory (EQ-i) instrument is the most widely used measure of emotional intelligence and it has a 36% overlap with other measures of emotional intelligence and a canonical R of .82 in prediction of EI effectiveness (Bar-On, 2004). The variables examined included five independent variables (Intrapersonal Skills, Interpersonal Skills, Adaptability Skills, Stress Management Skills, Income) and the dependent variable (GPA). A demographic survey containing 8 items was added to the *Emotional Quotient Inventory* (Bar-On, 2006).

4. Data analysis

Several statistical tests were performed to analyze the data using the Statistical Package for the Social Sciences (SPSS) data analysis software. The data collected, was sorted into two groups. Group 1 comprised of students identified as low income (low-income threshold for a family of four with two children was \$45,622) by the U.S. Department of Health & Human Services (2014). Group 2 comprised students who were not economically disadvantaged. Data analysis compared the two groups to determine if low income students had a higher correlation between low EI and academic success compared to their peers who did not have a low income.

The students reported Grade Point Average (GPA) was re-coded into an interval variable for the purpose of satisfying the level of measurement requirement of multiple regression analysis. Subsequently, academic success was used as a dependent variable assessed by the students' GPA scores. Multiple regression design requires that the dependent variable be metric and the independent variables be metric or dichotomous. In an effort to avoid Type I or Type II error, or over- or under-estimation of significance or effect sizes assumptions underlying the regression analysis were tested. The researchers followed the guidance of the most frequently cited assumptions in the statistical literature, which included, a) normal distribution of continuous variables, b) no multicollinearity, c) linearity between independent and dependent variables, d) homoscedasticity and reliability of all variables. Any statistical indices concerning the model that were not robust or violated regression assumptions were statistically transformed to meet statistical regression guidelines.

Subsequently, scores from the EO-i and the demographic survey were used to analyze all variables. The parametric test, stepwise multiple regression and ANOVA analyses were used to determine if any relationships or differences existed between variables of interest. Thus, stepwise multiple regression analysis was used to identify the subset of independent variables with the strongest relationship to the dependent variable and test the study research question (Bracey, 2003; Creswell, 2003; Gravetter & Wallnau, 2005; Kirkpatrick & Feeney, 2007).

The standard alpha of 0.05 was used to determine if there is a significant relationship between the independent variables and dependent variable. Additionally, the found R2 value with the associated standardized beta was used to determine the variance accounted for and the power of the multiple regression equation.

5. Results

To answer the research question, regarding the relationship between emotional intelligence factors, and academic success among low income students, separate ANOVA and Regression analysis were run for each set of variables hypothesized to test whether a significant relationship existed between EI (and it subscales) and Academic Success of students from low income.

In order to insure reliability of the results basic parametric assumptions analyses were undertaken by testing assumptions of normality, linearity, multicollinearity, and homoscedasticity.

Thus, a Shapiro-Wilk's test (p > .05) and a visual inspection of their histograms, Normal Q-Q plots and box plots indicated that the data are approximately normally distributed for the independent and dependent variables (Pedhazur, 1997). See *Figure 1*.

The dependent variable yielded a skewness of -0.017 (SE= 0.130) and a kurtosis of 0.584 (SE= 0.717). By dividing the skewness measure by its standard error, a skewnes z-value of .130 was generated, which is neither below -1.96 nor above +1.96. The same approach was used to calculate the kurtosis z-value, which divided the kurtosis measure of -322 by the Standard Error (SE) of .259 = -1.24. The kurtosis z-value was neither below -1.96 nor above +1.96. The skewness z-value of some of the independent variables failed marginally outside of the recommended span of -1.96 to 1.96 (Razali & Wah, 2011). Additionally, The Shapiro Wilk test p- values were above 0.05 as shown in Table 1.

Normal Q-Q plots and box plots visually indicated that the data were approximately normally distributed. It is noteworthy, the data does not have to be perfectly normally distributed, but it must be approximately normally distributed to meet the recommended regression assumptions. Statistical indices, histograms and Q-Q plots indicated the data is kurtotic, but it does not differ significantly from normality. Subsequently, it is safe to say that the data is approximately normally distributed, in terms of skewness and kurtosis. The null hypothesis for the test of normality is that the data is normally distributed. Since the p-values were above 0.05 the null hypothesis is accepted (Tabachnick, & Fidell, 2008).

Next, stepwise regression and ANOVA analyses were run to determine if any relationships or differences existed between variables of interest. The main goal, however, was to answer the study research question by producing a predictive model that is parsimonious and accurate while excluding variables that did not contribute to explain variances in the dependent variable. The measurement model was tested using stepwise to look into the correlation matrix, select variables with the largest Pearson correlation and enter them consecutively into the regression equation as strongest predictors of the dependent variable, academic success (GPA).

The following latent variables were entered into the model to test if they were statistically significant contributors to the multiple regression equation. The Pearson correlation and descriptive statistics of the variables in the model are shown in Table 2.

The initial model (Table 2) hypothesized that Intrapersonal Skill, Interpersonal Skill, Adaptability Skill, Stress Management Skill, and Income predicted Academic Success (GPA). However, this initial model, did not have acceptable model fit statistics. Although, regression correlations between all the independent and dependent variables were statistically significant (p < .05), only two independent variables (Income and Stress Management Skills) satisfied the statistical criteria for entry into the regression model. The independent variable, *Income* had the largest correlation (.49) in association with the dependent variable, GPA. Stress Management Skills had the second largest correlation (.26). Other variables in the initial model did not have sufficient statistical indices to be included in the multiple regression analysis (Carver & Nash, 2006). See Table 3.

The model summary statistics indicating the 'goodness of fit' of the model is projected in Table 4. This table showed the multiple correlation coefficients R, the R-squared (R2) and the Adjusted R-Squared (R2) version of this coefficient, which can range from 0 to 1 and indicate the 'goodness of fit' of the model. Results revealed that the model containing the two variables, Income and Stress Management Skills predicted 25 percent of the respondent's academic success. Applying Cohen's criteria for effect size, the relationship between GPA and the two independent variables was characterized as greater = strong (Multiple R = 0.05).

The multiple regression square value was 0.25 and its adjusted square was 0.25. The model showed that about 25% of the total variation in the academic success of the respondents (GPA) is accounted for by a linear combination of the two independent variables (Rosenthal, 2001). Additionally, the Durbin-Watson statistics suggest that values of test results should range from 1.5 to 2.5. Since results shown on Table 4 are 1.91 it is safe to conclude there is no issue of multicollinearity. The absence of multicollinearity suggests that another requirement for multiple regression analysis is satisfied, which increases validity of the multiple regression results.

Results of ANOVA displayed in table 5 indicate that the linear combination of the variables, Income and Stress Management Skills had a statistically significant relationship with academic success (F (1) = 112.00, p < 0.05) as hypothesized. The strength of F-values and the p-values been far from (p<0.05) indicated that the hypothesized model fits the data well.

The goal was "to find a model that not only fits the data well from a statistical point of view, but also has the property that every parameter of the model can be given a substantively meaningful interpretation" (Joreskog, 1993, p. 295).

Furthermore, results in table 5 indicate that the R2 of the present model is greater than zero the null hypothesis that "all of the partial slopes (b coefficients) = 0" is rejected, supporting the research hypothesis that Income and Stress Management Skills are the strongest predictors of academic success (F (1) = 112.00, p < 0.05). See Table 5. Table 6. include un-standardized regression weight (β), standard error of estimate (SEβ), the standardized coefficient, the t-ratio, tolerance values, VIF values and level at which the t-value is statistically significant. The estimated regression coefficients are measures of the predicted changes in the dependent variable by each of the independent variable.

For the independent variable Income, results indicated a structure coefficient of 1.14, a standard error of 0.11, and a T-value equal to 10.70 that was statistically significant at the p < .05 level of significance. The structure coefficient was positive and statistically significant. We reject the null hypothesis that the slope associated with the variable Income is equal to zero (b = 0) and conclude that there is a statistically significant relationship between the variable Income and academic success (GPA) as hypothesized. For the independent variable Stress Management skills, results indicated a rebut structure coefficient of .61, and T-value equal to 4.04 that was positive and statistically significant at P<.05. Thus, we reject the null hypothesis that the slope associated with the variables, Income and Stress Management Skills is equal to zero (b = 0) and conclude that there is a statistically significant relationship between Income and Stress Management Skills and academic success as hypothesized.

Table 6, shows that the variable Income had the largest structure coefficient, which indicates this variable made the highest contribution ($\beta = 1.14$, t= 10.70, P<0.05). In other words, respondents with higher income levels had higher GPA. Low income students experienced lower levels of academic success. Stress management skills had the second largest structure coefficient, which contributed ($(\beta = .61, t = 4.02, P < .05)$). Results predicted change in the dependent variable when the independent variable is increased by one unit. When the independent variable Income changes one unit, academic success (GPA) changes 114 % assuming that there is no change in the rest of variables. Similarly, one unit increase in the independent variable, Stress management skills generates a 61% variation in the dependent variable academic success (GPA).

All structure coefficients are statistically significant at P<0.05 level of significance. The tolerance values for all independent variables in the model are in acceptable range of greater than zero. VIF values are also in acceptable range, which is below 2. Independent variables with a higher t values are more influential as compared to variables with lower t – values. See Table 6.

6. Practical Implications

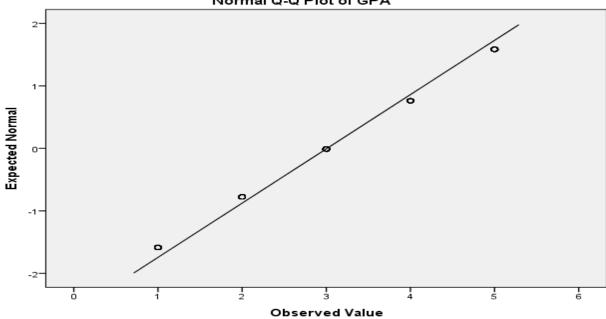
The study results support the current body of literature that addresses the impact of low income status on academic success of college students (Durlak & Weissberg, 2007; Finn & Petrelli, 2006; Goleman, 1995; Hobbs, 1990; Lloyd, et al., 2006; Low & Nelson, 2005; Matthews, 2006; Mayer, Salovey, & Caruso, 1999; Parker, et al., 2004; Tuma, 1989). Educators must be conscious of the threat imposed by low income status on the ability of students performing well and fulfilling their infinite human capacity. Consequently, educators must be able to develop data driven interventions to maximize academic success.

This study provides a basis to expand future research studies regarding the academic success of low income students in postsecondary education. In addition, the strategic use of this data can also inform the development of strategies focused on how emotional intelligence might help to mitigate the influence of low income status on the academic success of college students. The fact that Stress Management Skills and Income status are strong predictors of academic success intimate the development of emotional intelligence driven programs to foster Stress Management Skills targeting low income students. Since emotional intelligence can be learned, educators should infuse rudiments of emotional intelligence in their courses. Introducing programs that teach principles of emotional intelligence may appear to be radical choice for many education policy makers. Often, schools are driven by state guidelines where evaluations for learn outcomes are in place. Educational leaders, however, are expected to make a difference, which means change of mind set, curriculum and strategies. When students feel their needs are well addressed, when they feel respected, and have a safe place to display their emotions, it can lead to achievement in all domains. Goleman (1995) summarized with following statement: "teaching at-risk students social and emotional skills will result in fewer disciplinary issues in the classroom, and higher academic achievement" (p. 2).

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Figure 1. Normal Q-Q Plot of GPA



Q-Q Plot of dependent variable GPA.

Table 1.

		Kolmogorov-Smirnov ^a			Shapiro-Wilk			
	EI - Subscales	Statistic	df	Sig.	Statistic	df	Sig.	
GPA	Intrapersonal Skills	.250	4	.318	.915	4	.683	
	Interpersonal Skills	.349	5	.046	.771	5	.046	
	Adaptability Skills	.197	21	.032	.919	21	.084	
	Stress Management Skills	.174	14	$.200^{*}$.936	14	.368	

Test of Normality

Table 2.

	GD.	Intrapersonal	Interpersonal	Adaptability	Stress Management	_
Latent Variables	GPA	Skills	Skills	Skills	Skills	Income
GPA	1.00					
Intrapersonal Skills	.06	1.00				
Interpersonal Skills	.01	.25	1.00			
Adaptability Skills	.04	.40	.11	1.00		
Stress						
Management	.26	.34	.10	.51	1.00	
Skills						
Income	.49	.14	.02	.05	.04	1.00
Mean	3.00	49.37	81.44	62.52	40.63	1.48
Standard Deviation	1.15	8.05	8.96	7.81	7.23	.50

Inter-correlation and descriptive statistics

Note. N-353; * Correlation is significant at the $p \le 0.05$ level (2-tailed).

Table 3.

Model	Variables Entered	Variables Removed	Method
1.00	Income		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F- to-remove >= .100).
2.00	Stress Management Skills		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F- to-remove >= .100).

Variables Entered/Removed Note. Dependent Variable: GPA

Table 4.

				Std. Error of the	
Model	R	R Square	Adjusted R Square	Estimate	Durbin-Watson
1.00	0.49^{a}	0.24	0.24	1.00	•
2.00	$0.50^{\rm b}$	0.25	0.25	1.00	1.91

Model Summary

a. Predictors: (Constant), NCOME

b. Predictors: (Constant), INCOME, Stress Management Skills

c. Dependent Variable: GPA

Table 5.

Model		Sum of Squares	df	Mean Square	F	Sig.
1.00	Regression	112.97	1.00	112.97	112.00	.03 ^b
	Residual	352.03	349.00	1.01		
	Total	465.00	350.00			
2.00	Regression	117.06	2.00	58.53	58.54	.01°
	Residual	347.94	348.00	1.00		
	Total	464.997	350			

ANOVA results

a. Predictors: (constant), Income and Stress Management Skills

b. Dependent variable: GPA

Table 6.

						95.	0%					
	Unstandardized Standardiz		Standardized	Confidence						Collinearity		
	Coefficients		Coefficients	_		Interval for B		Correlations		Statistics		
	Std.		-	-		Lower	Upper	Zero-	=	•	=	•
	В	Error	Beta	t	Sig.	Bound	Bound	order	Partial	Part	Tolerance	VIF
(Constant)	1.32	.17		7.84	.00	.99	1.65					
Income	1.14	.11	.49	10.58	.02	.92	1.35	.49	.49	.49	1.00	1.00
(Constant)	1.91	.34		5.65	.00	1.25	2.58					
Income	1.14	.11	.50	10.70	.00	.93	1.35	.49	.50	.50	1.00	1.00
Stress												
management Skills	0.61	.03	.30	4.02	.04	.31	.72	.28	.30	.30	1.00	1.00

Coefficients

a. Dependent variable: GPA