Journal of Scientific Enquiry
Vol: 1, Pages: 161-165

Research Article

Re-examining the relation of Core self-evaluations and Academic performance: Investigating the mediating role of Cognitive test-anxiety

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Received: 01.11.2021; accepted: 07.12.2021; published online: 30.12.2021

The present study attempted to investigate the mediating effect of Cognitive Test-anxiety (CTA) between the relation of Core Self-evaluation (CSE) and academic performance. Sample consisted of 599 class 12 students from different schools in Kolkata belonging to both English and Bengali medium schools and from both science and humanities streams. Subjects were selected according to the inclusion criteria to maintain homogeneity of sample. To carry out mediation analysis PROCESS macro for SPSS by Preacher & Hayes, 2004 was used. Data was analyzed using SPSS 22 version. Results showed CSE positively predicted academic performance which was significantly mediated by CTA. It can be said that CSE being a dispositional variable its relation with academic performance can be strengthened or weakened by underlying cognitive factors, one important among them being CTA which predisposes an individual to experience anxiety in evaluative situations thereby lowering performance.

Key words: Core Self-evaluation, Cognitive test-anxiety, Academic performance, Mediation analysis.

1. Introduction

The study primarily revolved to explore the relationship between three variables that have gained importance in the area of learning; they are core self-evaluation (CSE), cognitive test-anxiety (CTA) and academic performance. In late nineties, Judge, Locke, and Durham (1997)[1] put forward their construct termed as core self-evaluation (CSE) or can be referred as self-concept. This construct can be defined as a wide dispositional trait that generally encompasses four traits—self-esteem, locus of control, generalized self-efficacy, and emotional stability. Although initially was used as a plausible interpretative variable behind job satisfaction, but later Judge and colleagues explained that the variable was also related to work motivation and job performance[2]. More recently this dispositional trait has also been studied and implicated in academic performance. In a quite interesting study by Judge and Hurst (2007) the underlying dynamics was elaborated, such as individuals with high CSE generally tend to perceive situations more positively, see oneself in more advantageous positions than what is given out in those situations and will put in more effort to draw out benefits[3]. In light of these observations the positive relationship with CSE and job performance that have been documented earlier can be seen[4] but now researchers think there exists some conditions which influences this relation by either strengthening it or weakening it, implicating the role of some underlying cognitive variables that may work thus producing a lower performance among individuals. So it is also reasonable to assume that there can an underlying play of cognitive factors between the relationship between core self-evaluation and academic performance. It may also be hypothesized that core self-evaluations make individuals more prone to perceive their external environment in a particular way, needless to mention that it would also play a role in evaluative situations. Contemporary research has successfully established positive relationship between CSE and performance, but the underlying factors which influence this association are relatively unexplored. One such related variable of interest is Test anxiety (TA)[5], which can be described as how an individual appraises a threatening situation[6].

Test-anxiety usually is an anticipatory anxiety that generally students face before an examination encompassing the physiological or bodily manifestations and intrusive thoughts of worry mainly revolving around fear of failure, dread and calamitous experiences before or during examinations. Primarily this anxiety stems from a sense of threat in the evaluative situation, this anxiety

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further interferes with normal cognitive functioning of an individual especially attention and memory functioning[7]. Sarason's works in the early 1970s have stated that TA is a bi-dimensional construct which includes worry and emotionality dimensions[8]. In this study only the cognitive aspect of TA referred as CTA is considered as it is thought that it may be a possible mediator between CSE and academic performance. The following areas were explored in this study and hypotheses were formulated.

1.1 CSE and Academic Performance

Past research presents some inconsistencies regarding the relationship between CSE and Academic performance. Studies done by Khaola & Mahao (2019)[9] and Rosopa & Schroeder (2009)[10] documented no significant relationship between CSE and academic performance while studies by Debicki et al. (2016)[11] show a positive relationship indicating individuals with high CSE will show superior performance.

Hypothesis 1: CSE will positively predict academic performance.

1.2 CSE and TA

The exploration of relationship between CSE and TA has been very scanty. Study done by Putawain and Daniels 2010 found that there exists weak negative correlation between thoughts (a construct of multidimensional TA scale) and general school self-concept[12]. Moreover weak negative correlations were found between all the three types of self-concept (general, mathematical and verbal) and off-task behaviors (another construct of multidimensional TA scale). Elaborating the above findings, the study documented that student who scored high on self-concept measures reported to experience fewer intrusive thoughts.

Hypothesis 2: CSE will negatively predict CTA.

1.3 TA and Academic performance

There have been widely documented reports citing the relationship between TA and academic performance. Test anxiety is related to lower achievement scores (and GPA), as elaborated that students with high TA find it difficult to adequately represent their competency level in evaluative situations[13,14]. Substantial evidences also confirm negative relationship with TA and academic achievement[15]. In general, TA seems to produce a variance of about 4% in the performance studied under various evaluative settings, which included diverse performance indicators such as sports, math performance, social settings and occupational settings[16].

Hypothesis 3: CTA will negatively predict Academic performance.

1.4 CSE, TA and Academic performance

As previous studies have implicated that TA exhibits a negative significant relationship between academic performance[14,16] and it also has a negative relationship with CSE[12]. CSE being a dispositional construct predisposes an individual to perceive in a certain way, so it could be possibly assumed that TA could play a role as a mediator in the relationship between CSE and Academic performance.

Hypothesis 4: TA will mediate the relationship between CSE and Academic Performance.

2. Materials and Methods

2.1 Participants

The sample consisted of 599 class 12 students aged 16-18 from different schools in Kolkata. Students from both English and Bengali medium schools and from science and humanities stream were included in the study. The education system in India is designed in such a way that at the end of class 12 students are exposed to a variety of high-stake examinations. This automatically creates a state of anxiety in students. So in this study class 12 students were chosen as the sample group. Students who were living with their family in Kolkata with none of the parents deceased, divorced or remarried, students who had changed school or failed in any examination recently or having any chronic physical, mental or neurological problems were not selected in this study. These factors were taken into consideration to maintain the homogeneity of the sample.

2.2 Measures

A brief socio-demographic proforma was given which included some relevant details as age, gender, stream of education, medium of school.

1. To assess self-evaluation the study employed core self-evaluation scale (CSE) by Judge, Erez, Bono, & Thoreson[17], which measures individual's basic assessments about their own abilities and their control. The scale consisted of 12 items providing a composite score for core self-evaluation. Respondents have to rate each item from 1 (strongly disagree) to 5 (strongly agree). The test consists of direct and reverse scoring items. Judge et al. (2003)[17] found a reliability score of .83

in four studies. The coefficient alpha for undergraduate sample was .80 and for classified staff sample was 0.84, with a Cronbach's alpha of 0.63[18].

2. To measure the cognitive aspect of TA, Cognitive test-anxiety scale[19] was employed. The scale consisted of 27 items specifically focused on the cognitive dimension of test-anxiety generally referred as worry. This dimension incorporates task-irrelevant thinking during test taking and preparation, tendency to compare with others during test taking and preparations, having interfering thoughts while studying or examinations, or having related cues that divert attention of learner during examination.
3. Academic achievement was obtained by taking into consideration the percentage of marks in class 11 annual examinations.

2.3 Procedure

Students were selected from seven schools in Kolkata. School authorities were contacted for obtaining necessary permission and accordingly date for data collection was fixed. Informed consent was taken from every student and they were explained the purpose of the study.

2.4 Plan of analysis

Before data underwent mediation analysis the scores were transformed into standard z scores and range of -3 to $+3$ was fixed according to previous literature[20]. All the data in the present study were within the specified range, so there was no data omission. To assess normality skewness and kurtosis were considered and according to the relevant literature the range for skewness and kurtosis are -1.5 to $+1.5$[21], and the data was found to be within normal limits.

2.5 Analysis of data

In this study mediation analysis was employed (Mediation Model 4; Preacher & Hayes, 2008)[22]. For bootstrapping the reliability interval was fixed as N = 5000. SPSS 22.0 was used and for mediation analysis the PROCESS macro was uploaded.

3. Results

3.1 Preliminary Analysis

The descriptive statistics of all the variables are presented Table 1. Correlation analysis demonstrated statistically significant positive relationship between CSE and Academic performance ($r = .152$; $p < 0.01$) and negative relationship between CSE and CTA ($r = -.103$; $p = 0.01$). Whereas there exists significant negative correlation between CTA and Academic performance ($r = -.346$; $p < 0.01$).

Table 1: Results of Descriptive Statistics and Bivariate Correlation among the Variables (CSE, CTA and Academic performance)

Variables	Mean	S.D.	Skewness	Kurtosis	1	2	3
CSE	38.03	5.58	.227	−.020	*	−103**	.152*
CTA	49.19	7.41	1.21	1.32		*	−.346**
Academic Achievement	61.62	12.09	−.286	−.531			*

*$p < .01$, **$p < .001$

Table 2: Mediation Results of TA on the Relationship between CSE and Academic Performance

	Test-anxiety (TA)										
IV	Total Effects		Direct Effects		IV ⟶ M1		M1 ⟶ DV		Indirect		95% CI
CSE	c		c		A		b		$a \times b$		
	b	SE	b	SE	b	SE	b	SE	b	SE	
	.328#	.0875	.254**	.0829	−.136*	.054	−.544#	.062	.074	.029	[.020,.135]

Note: #$p < 0.001$; **$p < 0.01$; *$p < 0.05$

3.2 Mediation analysis of CTA, CSE and academic performance

Results demonstrating the coefficient of the direct effects showed positive relationship between CSE and Academic achievement and negative relationship between CSE and TA. The indirect effect of CSE on academic achievement along-with the mediator variable was also significant. Results show-

ing the explained variance together with CSE revealed that the model accounted for 13% of the variability in academic achievement. The 95% C.I. of the upper and lower values indicated that TA proved to be a significant mediator between CSE and Academic performance.

4. Discussion

The aim of the present study was to examine the mediating effect of TA on the relationship between CSE and academic achievement. The results are explained in separate sections.

4.1 Impact of CSE on academic performance

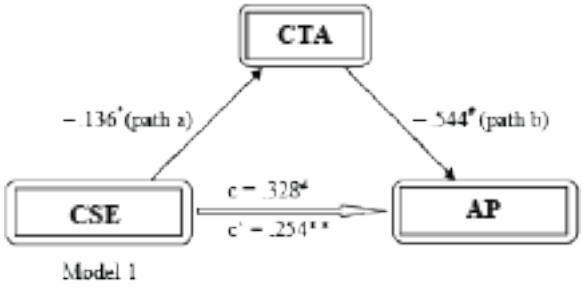
CSE have been described as a cohesive way of thinking about many issues that will have a tendency to influence performance be it job performance or academic performance. The theoretical foundations of CSE explain underlying structures that provide plausible explanation to the relation between personality dispositions and behavioral variables enabling constructive predictions[23]. Study results show CSE positively predicted academic performance, these results are in line with Debicki et. al (2016)[11] states there is a positive relationship between CSE with Academic Performance. Although there were many studies preciously done which provided some inconsistent results but this study findings strongly implicated the impact of CSE on Academic performance, so hypothesis 1 is accepted.

4.2 Impact of CSE and CTA

Study finding has revealed that CSE negatively predicted CTA. Earlier studies by Putawain & Daniels 2010[12] showed weak negative correlation between intrusive thoughts and general school self-concept but this study finding successfully confirmed the relation between CSE and CTA, so hypothesis 2 is also accepted.

4.3 Impact of CTA and academic performance

Findings show that CTA negatively predicts academic performance. The findings of the current study are in line with the earlier research findings which show that evaluative anxiety significantly lowers performance done on diverse student populations and difference performance indicators[14,15,16]. So the study done on higher secondary students in Kolkata also supports previous literature and therefore hypothesis 3 is accepted.



Note: AP = Academic performance $\#p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Fig. 1. Mediation of TA in the relationship between CSE and Academic Performance with non-standardized beta values.

4.4 Mediating role of cognitive test-anxiety

Table showed that CTA successfully mediated the relationship between CSE and Academic performance among higher secondary students in Kolkata. The direct effect of IV (CSE) was significantly reduced when the mediator variable was added in the equation. CSE is generally referred to as a construct which included self-esteem, self-efficacy, emotional stability and beliefs in personal control[1] and these factors itself orients an individual's cognitive processes in a fashion so as to strive for improved performance. As they find themselves more in control of their abilities and in better shape to handle situations with high CSE so the cognitive dimensions also work in that manner. CTA being a cognitive variable was hypothesized as being a potential mediator between CSE and academic performance. It can be said as previously stated that there may be underlying cognitive variables present in the relationship between CSE and academic performance; here CTA has been proved to acting as a mediator. Individuals low on CSE generally exhibit high levels of intrusive thoughts during examination situation which leads to poor academic performance, and we can say that hypothesis 4 is also accepted.

5. Conclusion and Implications

The study attempted to bring out the complex relationship between CSE, CTA and academic performance, which reveals that there exists interplay of cognitive factors strengthening or weakening the CSE and academic performance relations. Findings show dispositional variables shape our current perceptions to produce lowered performance levels. Moreover it can be said that as in this study the mediating role of CTA was stud-

ied, it provided insight that students with low CSE tend to report more intrusive thoughts of worry that interfere during examinations. CSE and CTA both being a cognitive variable showed that positive evaluations about self tend to protect individuals from distressful intrusive thoughts or individuals with more positive self-evaluations are adept at handling thoughts of worry during examinations. Current research findings opens up avenues for appropriate counseling aimed at rectifying core issues, which in turn can reorient current perceptions that is seen to influences performance.

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