

A Moderated Mediation Model of Negative Life Events, Dysfunctional Attitudes, the Cognitive Triad and Depressive Symptoms

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Abstract

This study examined the theoretical model derived from Beck's cognitive theory of depression in two samples of Taiwanese undergraduates. This model hypothesized dysfunctional attitudes as a diathesis-stress component and the cognitive triad as a causal mediation component in the development of depressive symptoms. Moderated mediation analysis was employed to test the theoretical model with two independent samples from Taiwan. One was 248 undergraduates from lower prestige higher education institutes (HEIs); the other was 247 undergraduates from high prestige HEIs. Participants completed the List of Threatening Experiences, the 24-item Dysfunctional Attitude Scale, the Cognitive Triad Inventory and the Beck Depression Inventory. All of the measures are Chinese versions. Statistical analyses indicated that the effect of interaction between negative life events and dysfunctional attitudes on depressive symptoms was not significant in the two samples. However, in the undergraduates of lower prestige HEIs, the interaction of negative life events and dysfunctional attitudes was related to depressive symptoms through the cognitive triad. The result supported that the cognitive triad is the proximal causal mediation component of depressive symptoms, while dysfunctional attitudes are the distal diathesis-stress component in the undergraduates of lower prestige HEIs. The practical implication for cognitive therapy in this population is discussed.

Keywords: Depressive symptoms; Dysfunctional attitudes; Moderated mediation model; Negative life events; The cognitive triad

Introduction

In the exploration of depression antecedents, stress has been considered as an important factor in the development of depression. However, research has reported that negative life events alone only account for a relatively modest percentage of the variance in depression [1,2]. This indicates that other variables may contribute to the relationship between negative life events and depression. Meanwhile, an idea has long been held that cognitive variables are important factors in the development of depression [3-7]. Stress and cognitions are seen to combine to explain depression, forming the cognitive vulnerability-stress model. This model posits that stress activates cognitive vulnerability factors (the diathesis), transforming the potential of predisposition into the presence of depression [8-11].

One of the most prominent cognitive vulnerability-stress models of depression is Beck's cognitive theory of depression [4-7]. The central concept of Beck's cognitive theory is depressogenic schemas. Beck's theory hypothesizes that depressogenic schemas contain dysfunctional attitudes (i.e., a set of overrigid and inappropriate beliefs or attitudes about the self and the world that one builds based on earlier negative experiences). Depressogenic schemas are typically latent. They are activated when one encounters situations similar to those of earlier negative experiences. Activated depressogenic schemas subsequently affect how a person screens, encodes, and evaluates information regarding the situations, and then eventually lead to the development of depressive symptoms. Based on the aforementioned assumptions, depressogenic schemas can be regarded as a cognitive vulnerability factor or diathesis-stress component of depression. In the past 30 years, empirical studies have used self-reported dysfunctional attitudes as a method for assessing depressogenic schemas [12-22]. Our study adopted the method used by the past studies and employed dysfunctional attitude as the operationalization of depressogenic schemas. According to Beck's theory, when encountering negative life events, individuals with dysfunctional attitudes are more likely to have negatively biased thoughts and thus generate depressive symptoms than individuals

without dysfunctional attitudes. In other words, dysfunctional attitudes would interact with negative life events to generate depression.

Beck's theory also includes a causal mediation component – the cognitive triad, which is defined by Beck as a negative view of the self, the world and the future [4,7,23]. Beck and his colleagues observed in clinical work that, when experiencing negative life events, depressive patients demonstrated the cognitive triad, and subsequently developed depressive symptoms. Beck and his colleagues hypothesized that depressogenic schemas provide the basis for forming the cognitive triad. Specific stressors impinging on depressogenic schemas might set off the cognitive triad. Its appearance ensures the development of depressive symptoms. Based on the assumptions above, cognitive theorists have suggested that the etiological chain of Beck's theory can be understood as the interaction of dysfunctional attitudes and negative life events contributing to depressive symptoms through the operation of the cognitive triad [12,16,20]. In this etiological chain, the cognitive triad is viewed as the proximal causal mediation component of depressive symptoms, while dysfunctional attitudes are the distal diathesis-stress component [8,9].

Validation studies of Beck's diathesis-stress component in a student population have indicated that the interaction of dysfunctional attitudes and negative life events was related to subsequent depressive symptoms [12-16,19,24]. However, other researchers have failed to observe the interaction [17,25-28]. For the validation of the causal mediation component in Beck's theory, previous studies have focused

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on examining the different broad classes of negative cognition, such as negative automatic thoughts [22], depressive cognitions [16], and negative cognitive styles about the self and consequences [12], instead of examining the cognitive triad described in Beck's theory. Because the etiological chain of Beck's theory has not obtained strong support yet, this study aims to re-examine the relationship between the dysfunctional attitudes by negative life events interaction and depressive symptoms, and the mediational role of the cognitive triad in this relationship.

Researchers have suggested that it is better to use vulnerable populations that have experienced more negative life events to examine the etiological chain of Beck's theory. The advantage is that they are more likely to develop depression under pressure, which makes it more likely to observe findings that support Beck's theory [22]. This study employs students of low prestige higher education institutes (HEIs) in Taiwan to test the etiological chain of Beck's theory. The HEIs in Taiwan can be ranked according to whether or not they obtain the top and teaching-excellence subsidies from the Ministry of Education. Those HEIs which do not, have lower prestige. The great majority of them are private technical and vocational colleges, which are postsecondary educational institutions designed to provide job-specific training for students who intend to obtain employment. On the other hand, most of the high prestige HEIs are public or private academic universities, which focus on providing academic training for students pursuing careers in a professional discipline.

Taiwanese studies have reported that, compared with students of top universities, most of the students of private technical and vocational colleges come from more disadvantaged socioeconomic backgrounds. They have lower parental educational level, lower family income, and lower academic achievement in high schools [29-32]. Thus, we assume that students of lower prestige HEIs are more vulnerable to depression than those of high prestige HEIs, and thus more suitable to be used to examine the etiological chain of Beck's theory.

The first goal of this study is to use Taiwan students of lower prestige HEIs to examine if dysfunctional attitudes moderate the relationship between negative life events and depressive symptoms, and if the interaction of dysfunctional attitudes and negative life events is related to depressive symptoms via the cognitive triad. The theoretical model of this study is illustrated in (Figure 1) It is hypothesized that the relationship between negative life events and depressive symptoms would be moderated by dysfunctional attitudes. Besides, this relationship would be mediated by the cognitive triad. In other words, negative life events would be related to students' depressive symptoms via the cognitive triad such that the relationship would be stronger as the students had higher dysfunctional attitudes. The second goal of this study is to use another student sample, who are from high prestige HEIs, to examine the hypotheses of this study by comparing the results of this sample with those of the students of lower prestige HEIs. This study may provide important data to help understand the

cross-cultural generalizability of cognitive theory of depression, which originates from western-cultural societies (Figure 1).

Methods

Participants

This study used two sample groups. Sample 1 is 248 undergraduates recruited from lower prestige HEIs, which consist of two private technical and vocational colleges, with 123 of them (49.6%) being male. Their age ranges from 20 to 40, with a mean of 25.54 yrs (SD=4.00). Sample 2 is 247 undergraduates from high prestige HEIs, which consists of one public and one private academic universities, with 114 (46.2%) of them being male. Their age ranges from 19 to 42, with a mean of 22.21 yrs (SD=2.66). All of these schools are located in northern Taiwan. Written informed consent was obtained from all the participants.

Measures

List of Threatening Experiences (LTE): The LTE [33] is a 12-item instrument for measuring life events that tend to be threatening. Participants are to examine if they have experienced these negative events in the past six months. A total score is computed by using the scaling method of simply counting the number of events. That is, each item of the LTE is scored 1 if it is checked and 0 if not. The total score is the sum of all item scores. The authors reported that the 6-month test-retest reliability for each item in this scale was satisfactory. This study employed the Chinese version of the LTE, C-LTE. The analysis of 4-week test-retest reliability of the C-LTE on the data of Taiwanese undergraduates yielded a coefficient of 0.78 for the total scale score [34].

The 24-Item Dysfunctional Attitude Scale (24-item DAS): The 24-item DAS [35] is a 24-item self-report scale, used to measure the dysfunctional attitudes proposed by Beck's theory. This scale consists of three subscales: Achievement, Dependency, and Self-Control, each of which has 8 items. Being a 7-point Likert-type scale, it ranges from 1=totally agree to 7=totally disagree. Three out of the 24 items are to be scored in a reverse direction. The total score is the sum of all item scores. A higher score indicates stronger dysfunctional attitudes. The original author reported that this scale has good internal consistency, test-retest reliability, and construct validity. This study utilized the Chinese version of the DAS (C-DAS). The analyses of the C-DAS on the data of Taiwanese undergraduates yielded an overall internal consistency coefficient of 0.82, and an 8-week test-retest reliability of 0.81 for the total scale score [34].

Cognitive Triad Inventory (CTI): The CTI [36], which was designed to measure the cognitive triad hypothesized in Beck's theory, includes 36 items, with 30 of them being scored and 6 of them serving as fillers. This scale consists of three subscales: View of self, view of the world and view of the future. Each subscale has 10 items, with 5 of them being negatively phrased items and the other 5 positively phrased items. This scale is a 7-point Likert-type scale, ranging from 1=totally agree to 7=totally disagree. In this study, the negatively phrased items are to be reversing scored. The total score is the sum of all item scores, with higher scores representing great negative views. The original authors reported that the CTI has excellent internal consistency and high concurrent validity correlating with the BDI. This study used the Chinese version of the CTI (C-CTI). The analyses of the C-CTI on the data of Taiwanese undergraduates yielded an overall internal consistency coefficient of 0.93 and an 8-week test-retest reliability of 0.85 [34]. In the data analysis of this study, the 6 fillers were deleted. Moreover, Item 5 (I am a failure), Item 21 (I hate myself), and Item 29 (I am guilty of a great many things) were also deleted, as these three items are also included in Beck Depression Inventory.

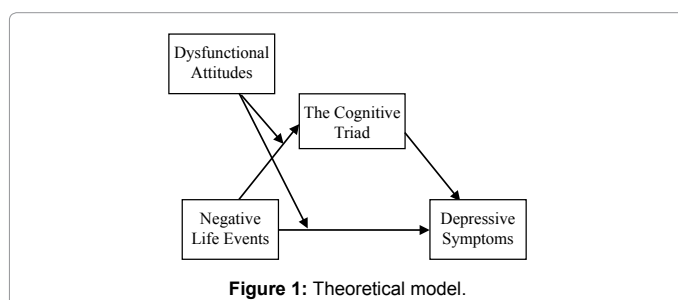
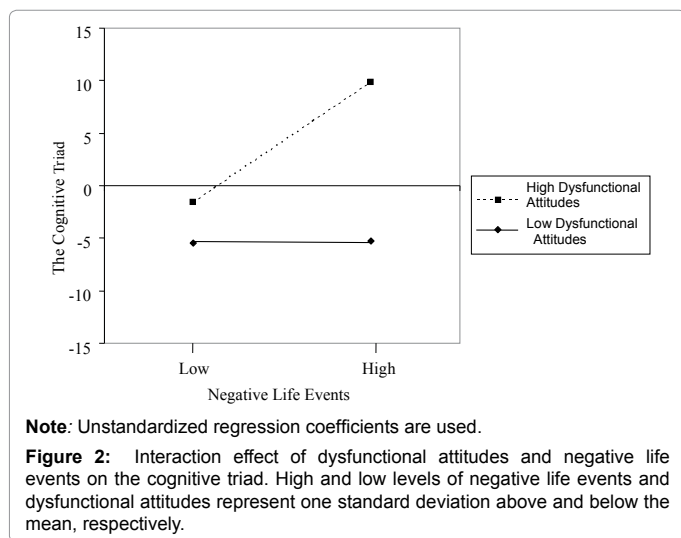


Figure 1: Theoretical model.

Measures	Sample of lower prestige HEIs				Sample of high prestige HEIs			
	Mean (SD)	Correlation			Mean (SD)	Correlation		
		LTE	DAS	CTI		LTE	DAS	CTI
LTE	1.71 (.92)	--	--	--	1.79 (1.02)	--	--	--
DAS	100.32 (13.93)	0.21**	--	--	101.33 (16.63)	0.05	--	--
CTI	76.81 (19.57)	0.23***	0.25***	--	81.37 (22.07)	0.17**	0.47***	--
BDI	9.88 (8.36)	0.31***	0.41***	0.57***	11.40 (7.84)	0.26***	0.46***	0.57***

Note: LTE = List of Threatening Experiences; DAS = Dysfunctional Attitude Scale; CTI = Cognitive Triad Inventory; BDI = Beck Depression Inventory; HEIs = Higher Education Institutes; SD = Standard Deviation.
 **p<0.01.
 ***p<0.001.

Table 1: Descriptive statistics and correlations.



Beck Depression Inventory (BDI): The BDI [37] is a 4-point Likert-type self-report scale. Each item is composed of 4 statements. They are scored from 0 to 3 to reflect the increase of depression level, with 0 being the lowest. Participants are required to rate the intensity on one of the four statements in each item that best describes their feeling during the past two weeks. The ratings are summed to yield a total score ranging from 0 to 63. A higher score indicates a higher level of depression symptom severity for the participant. Many studies have reported that the BDI has excellent reliability and validity [37]. This study used the Chinese version of the BDI (C-BDI) [38]. The analyses of the C-BDI on the data of Taiwanese undergraduates yielded an overall internal consistency coefficient of 0.90 and an 8-week test-retest reliability of 0.81 [34].

Procedures

The undergraduates were recruited from general education courses in each HEI. After obtaining the consent of the teachers in charge of the courses, the researcher presented himself at the classes and introduced the nature, purposes, and methods of the research to students first. Students who volunteered to participate then completed the questionnaires. In addition, all the students were informed that participation of this study was not mandatory, that they were free to withdraw at any time if they did not feel like continuing, that they were not required to sign on the questionnaire. Participation took approximately about 20 to 30 minutes. There were 538 student participants who completed the questionnaires. Of the 538 students, 23 had incomplete data; 20 had z-scores on the C-LTE, the C-DAS, the C-CTI or the C-BDI which were greater than 3 or less than -3 and were considered to be outliers [39,40]. Finally, 495 sets of data for students

were collected. Among them, 248 were by the students of lower prestige HEIs and 247 were by the students of high prestige HEIs. The response-rate of the students who participated in this study was 92%.

Data Analyses

The theoretical model of this study is a moderated mediation model, which was examined by SPSS macro (MODMED) designed by Preacher et al. [41]. The advantage of MODMED is that it uses both the normal theory approach and the bootstrap approach to provide the estimation of the significance of conditional indirect effects.

Results

Descriptive statistics

There was no significant difference on gender between the two participant groups, $\chi^2 [1]=2.97, p=0.09$. The means, standard deviations, and inter-correlations among the measures of the two samples are presented in (Table 1). Some of the findings should be addressed. The undergraduates of high prestige HEIs reported higher scores on the cognitive triad, $t (493)=2.43, p<0.05$, and depressive symptoms, $t(493)=2.09, p<0.05$, than those of lower prestige HEIs. All variables were mean centered prior to analyses to reduce multicollinearity between main effects and interaction [42] (Table 1).

The test of the moderated mediation model

Sample of lower prestige HEIs: The MODMED procedure includes several steps. In the first step, the mediator variable model (top of Table 2), examines the impact of the independent variable (negative life events), the moderator variable (dysfunctional attitudes), and their interaction on the mediator variable (the cognitive triad). The results revealed a significant main effect of negative life events on the cognitive triad, $B=3.17, t=2.32, p<0.05$. In addition, the results also revealed a significant effect of the interaction between negative life events and dysfunctional attitudes on the cognitive triad, $B=0.24, t=1.98, p<0.05$. Figure 2 shows the simple slopes of the relationship between negative life events and the cognitive triad when the score of dysfunctional attitudes was one standard deviation above and below the mean. As all variables were mean centered, the mean of the cognitive triad, shown on the y-axis was zero. As predicted, the slope of the relationship between negative life events and the cognitive triad was greater in participants exhibiting high levels of dysfunctional attitudes (slope=6.37, $t=3.52, p<0.001$) than in participants exhibiting low levels (slope= -0.03, $t=-0.01, p=0.99$) (Table 2 and Figure 2).

In the second step of the MODMED procedure, the dependent variable model (bottom of Table 2) examines the impact of the mediator variable (the cognitive triad) on the dependent variable (depressive symptoms), while controlling the independent variable (negative life events), the moderator variable (dysfunctional attitudes), and their

Predictors	B	SE	t	p
Mediator variable model: The cognitive triad				
Constant	-0.63	1.22	-0.52	0.605
Negative life events	3.17	1.36	2.32	0.021
Dysfunctional attitudes	0.34	0.09	3.86	<0.001
Negative life events × Dysfunctional attitudes	0.24	0.12	1.98	0.048
Dependent variable model: Depressive symptoms				
Constant	-0.14	0.42	-0.33	0.740
Negative life events	1.19	0.48	2.50	0.013
Dysfunctional attitudes	0.17	0.03	5.26	<0.001
The cognitive triad	0.20	0.02	8.99	<0.001
Negative life events × Dysfunctional attitudes	0.05	0.04	1.26	0.210

Note: Unstandardized regression coefficients are reported. HEIs = Higher Education Institutes; B = Unstandardized Coefficient; SE = Standard Error.

Table 2: Regression results for estimated co-efficients of the theoretical model for the students of lower prestige HEIs.

Value of dysfunctional attitudes	Conditional indirect effect	SE	z	p	Bootstrap 95% CI	
					Lower	Upper
Conditional indirect effect at specified values of dysfunctional attitudes						
-1 SD (-13.93)	-0.06	0.54	-0.11	0.912	-1.11	1.04
M (.00)	0.62	0.31	2.02	0.044	0.04	1.35
+1 SD (13.93)	1.30	0.39	3.38	<0.001	0.56	2.13
Conditional indirect effect at range of values of dysfunctional attitudes						
-39.40	-1.31	1.14	-1.15		0.252	
-35.50	-1.12	1.05	-1.07		0.289	
-31.60	-.93	0.95	-0.97		0.330	
-27.70	-0.74	0.86	-0.88		0.391	
-23.80	-0.54	0.77	-0.71		0.477	
-19.90	-0.35	0.67	-0.52		0.600	
-16.00	-0.16	0.59	-0.28		0.782	
-12.10	0.03	0.50	0.06		0.954	
-8.20	0.22	0.43	0.52		0.605	
-4.30	0.41	0.36	1.14		0.253	
-.40	0.60	0.31	1.93		0.053	
3.50	0.79	0.29	2.72		0.007	
7.40	0.98	0.30	3.24		<0.001	
11.30	1.18	0.35	3.40		<0.001	
15.20	1.37	0.41	3.35		<0.001	
19.10	1.56	0.48	3.22		<0.001	
23.00	1.75	0.57	3.09		<0.001	
26.90	1.94	0.65	2.97		<0.001	
30.80	2.13	0.74	2.87		0.004	
34.70	2.32	0.84	2.78		0.005	

Note: Bootstrap sample size = 1000; SE = Standard Error; CI = Confidence Interval.

Table 3: Bootstrapping results for test of conditional indirect effects.

interaction. Results in Table 2 show that the effect of the cognitive triad on depressive symptoms was significant, B=0.2, t=8.99, p<0.001. This result, along with that obtained in MODMED procedure step 1, indicated that the existence of moderated mediation was established. The examination of the significance of moderated mediation effects was via the test of conditional indirect effects described by Preacher et al. [41] in the next step. In addition, results from the dependent variable model in Table 2 also show a non-significant effect of the interaction between negative life events and dysfunctional attitudes on depressive symptoms, B=0.05, t=1.26, p=0.21.

The third step of the MODMED procedure examines the significance of conditional indirect effects. MODMED provides two

methods for assessing the significance of conditional indirect effects. First, MODMED generates the values of the indirect effects of the independent variable on the dependent variable through the mediator at moderator values of mean and one standard deviation above and below the mean. The significance of these indirect effects is subsequently assessed using normal theory tests. Second, the MODMED generates the confidence intervals of the values of the indirect effects with bootstrapping techniques. The significance of these indirect effects is assessed afterwards via these confidence intervals.

The result is shown in Table 3. The normal theory tests indicated that the conditional indirect effects were significant when the mean-centered scores of dysfunctional attitudes were at the mean and one standard deviation above the mean. Bootstrap confidence intervals supported these results not including zero in the values. The conditional indirect effect was not significant when the mean-centered score of dysfunctional attitudes was one standard deviation below the mean. Bootstrap confidence intervals showed the result including zero in the values, as shown in the top of Table 3. Furthermore, the bottom of Table 3 presents the conditional indirect effect at the range of dysfunctional attitude values. As can be seen, the conditional indirect effect became significant when the mean-centered scores of dysfunctional attitude values were higher than -0.4. Based on these results, it can be concluded that the indirect effects of negative life events on depressive symptoms through the cognitive triad strengthened as the scores on dysfunctional attitudes increased (Table 3).

The test of the moderated mediation model

Sample of high prestige HEIs: Next, MODMED was utilized to examine the theoretical model of this study on the data of high prestige HEIs students. The results at the top of (Table 4) revealed a significant main effect of negative life events on the cognitive triad, B=3.31, t=2.75, p<0.01. However, the effect of interaction between negative life events and dysfunctional attitudes on the cognitive triad was not significant, B= -0.03, t= -0.41, p=0.68. This result indicated that the condition of moderated mediation was not established. In addition, the results at the bottom of Table 4 also revealed a nonsignificant effect (B=0.04, t=1.73, p=0.08) of the interaction between negative life events and dysfunctional attitudes on depressive symptoms (Table 4).

Discussion

The objective of this study was to use moderated mediation analysis to examine the diathesis-stress component and causal mediation component in Beck's cognitive theory of depression [4,7]. First, as

Predictors	B	SE	t	p
Mediator variable model: The cognitive triad				
Constant	0.03	1.23	0.02	0.982
Negative life events	3.31	1.20	2.75	0.006
Dysfunctional attitudes	0.62	0.07	8.35	<0.001
Negative life events × Dysfunctional attitudes	-0.03	0.07	-0.41	0.68
Dependent variable model: Depressive symptoms				
Constant	11.37	0.39	29.52	<0.001
Negative life events	1.36	0.38	3.56	<0.001
Dysfunctional attitudes	0.11	0.03	4.17	<0.001
The cognitive triad	0.15	0.02	7.56	<0.001
Negative life events × Dysfunctional attitudes	0.04	0.02	1.73	0.08

Note: Unstandardized regression coefficients are reported. HEIs = Higher Education Institutes; B = Unstandardized Coefficient; SE = Standard Error.

Table 4: Regression results for estimated coefficients of the theoretical model for the students of high prestige HEIs.

indicated by the analyses of descriptive statistics, undergraduates from high prestige HEIs had higher mean scores on the cognitive triad and depressive symptoms compared with undergraduates from lower prestige HEIs. The cause might be that the former experienced higher levels of academic pressure.

Secondly, the moderated mediation analysis showed that the moderation effect of dysfunctional attitudes was not significant in the relationship between negative life events and depressive symptoms in either sample of undergraduates. However, the results also revealed that, in the undergraduates of lower prestige HEIs, the positive indirect effects of negative life events on depressive symptoms through the cognitive triad strengthened as the levels of dysfunctional attitudes increased. In other words, these students' negative life events would increase depressive symptoms via the cognitive triad when they had high dysfunctional attitudes. However, such a result was not observed in the undergraduates of high prestige HEIs. These findings indicated that, in the undergraduates of lower prestige HEIs in Taiwan, the cognitive triad played a role as a mediator in the relationship between the negative life event by dysfunctional attitudes interaction and depressive symptoms, while dysfunctional attitudes acted as a moderator in the relationship between negative life event and the cognitive triad. The results supported the hypotheses of Abramson et al. [8] and Alloy et al. [9], which suggest that the cognitive triad is the proximal causal mediation component of depressive symptoms, while dysfunctional attitudes are the distal diathesis-stress component. The results also provided support for the cross-cultural applicability of Beck's cognitive model of depression, which originates from the western world, to the undergraduates of lower prestige HEIs in Taiwan.

A possible cause for the discrepancy of findings between the two student samples is sample differences. Many studies in Taiwan have reported that, in comparison with students of top universities, students of private technical and vocational colleges had more disadvantaged socioeconomic backgrounds [29-32,43,44]. These factors may cause the students of private technical and vocational colleges to be more vulnerable to depression. Oei and Kwon also reported a similar finding, which indicated that negative life events interacted with dysfunctional attitudes to increase depressive symptoms through a mediator (autonomic thoughts) in minorities, that is, immigrants that often encounter adjustment stress issues [22].

Here one thing must be explained in particular. Our previous result indicates that high prestige HEIs undergraduates had more cognitive triad and depressive symptoms than lower prestige HEIs undergraduates. This result is not in conflict with the finding of the significant conditional indirect effect observed in the undergraduates of lower prestige HEIs. The focus of the conditional indirect effect stresses that lower prestige HEIs undergraduates would exhibit depressive symptoms through the cognitive triad only if they were also currently experiencing a number of negative life events that impinged on their dysfunctional attitudes. This implies that these students were more vulnerable to depression. However, such a result was not observed in high prestige HEIs undergraduates.

This study yielded two important contributions. First, the current study find that the interaction of negative life events and dysfunctional attitudes was related to depressive symptoms through the cognitive triad in the undergraduates of lower prestige HEIs. However, this result was not found for undergraduates of high prestige HEIs universities. Obviously, the nature of samples is an important parameter to explain the reason for the findings of this study.

In addition, the result of this study support the ideas that the influence on depression by depressogenic schemas and the cognitive triad is cross-cultural, at least in the undergraduates of lower prestige HEIs in Taiwan. The implication of this result is that the cognitive psychotherapy developed on the basis of Beck's theory might be applied to part of Taiwanese undergraduates. This study suggests that modifying dysfunctional attitudes and the cognitive triad would improve the depressive symptoms of this population.

This study has some limitations. First, its design is cross-sectional, which posed limitations on the validation of causal relationships among variables. Future studies on relevant topics might further utilize a longitudinal design to examine the possibility of causal effects among variables. Moreover, all of the data of this study were obtained from nonclinical university student samples, whose levels of depressive symptoms did not reach the cutoff score of clinical depression. The BDI mean was 9.88 among undergraduates of lower prestige HEIs and 11.4 among undergraduates of high prestige HEIs. Therefore, the findings of this study were limited to the development of relatively mild depression, and might not be generalized to the psychopathology of clinical depression.

Conclusion

In summary, this study examined the application of Beck's cognitive theory of depression in two samples of Taiwanese university students. Future studies should employ a clinically depressed patient sample to replicate this result, so that the generalizability of this result from nonclinical students to clinical patients can be examined. Such studies would facilitate more extensive understanding on the cross-cultural generalizability of cognitive theory of depression, which originates from the western world, in non-western populations.

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References

1. Kraaij V, Arensman E, Spinhoven P (2002) Negative life events and depression in elderly persons: A meta-analysis. *J Gerontol B Psychol Sci Soc Sci* 57: 87-94.
2. Mann MJ, Kristjansson AL, Sigfusdottir ID, Smith ML (2014) The impact of negative life events on young adolescents: Comparing the relative vulnerability of middle level, high school, and college-age students. *RMLE Online* 38: 1-13.
3. Abramson LY, Seligman MEP, Teasdale J (1978) Learned helplessness in humans: Critique and reformulation. *J Abnorm Psychol* 87: 49-74.
4. Beck AT (1967) *Depression: Clinical, experimental, and theoretical aspects*. Harper & Row. New York.
5. Beck AT (1976) *Cognitive therapy and the emotional disorder*. International Universities Press, New York.
6. Beck AT (1987) Cognitive models of depression. *J Cogn Psychother* 1: 5-37.
7. Beck AT, Rush AJ, Shaw BF, Emery G (1979) *Cognitive therapy of depression*. Guilford, New York.
8. Abramson LY, Alloy LB, Metalsky GI (1988) The cognitive diathesis-stress theories of depression: Towards an adequate evaluation of the theories' validities. In: Alloy LB (Ed) *Cognitive Processes in Depression*. Guilford Press, New York, pp. 3-30.
9. Alloy LB, Hartlage S, Abramson LY (1988) Testing the cognitive diathesis-stress theories of depression: Issues of research design, conceptualization, and assessment. In Alloy, LB (Edn) *Cognitive Processes in Depression*. Guilford Press, New York, pp. 31-73.
10. Bebbington P (1987) Misery and beyond: The pursuit of disease theories of depression. *Int J Soc Psychiatry* 33: 13-20.

11. Monroe SM, Simons AD (1991) Diathesis-stress theories in the context of life stress research: Implications for the depressive disorder. *Psychol Bull* 110: 406-425.
12. Abela JRZ, D'Alessandro DU (2002) Beck's cognitive theory of depression: A test of integration of the diathesis-stress and causal mediation components. *Br J Clin Psychol* 41: 111-128.
13. Abela JR, Stolow D, Mineka S, Yao S, Zhu XZ, et al. (2011) Cognitive vulnerability to depressive symptoms in adolescents in urban and rural Hunan, China: A multiwave longitudinal study. *J Abnorm Psychol* 120: 765-778.
14. Barnett PA, Gotlib IH (1988) Dysfunctional attitudes and psychosocial stress: The differential prediction of future psychological symptomatology. *Motiv Emot* 12: 251-270.
15. Hankin B, Wetter E, Cheely C, Oppenheimer CW (2008) Beck's cognitive theory of depression in adolescence: Specific prediction of depressive symptoms and transactional influences in a multi-wave prospective study. *Int J Cogn Ther* 1: 313-332.
16. Joiner TE Jr, Metalsky GI, Lew A, Klocek J (1999) Testing the causal mediation component of Beck's theory of depression: Evidence for specific mediation. *Cognit Ther Res* 23: 401-412.
17. Klocek JW, Oliver JM, Ross MJ (1997) The role of dysfunctional attitudes, negative life events, and social support in the prediction of depressive dysphoria: A prospective longitudinal study. *Soc Behav Pers* 25: 123-136.
18. Ku YL, Chang YY, Tang TC, Lung FW, Chen NC, et al. (2010) Test of the relationships among different cognitive factors in Beck's cognitive model of depression. *Chinese J Psychol* 52: 47-56.
19. Kwon SM, Oei TPS (1992) Differential causal roles of dysfunctional attitudes and automatic thoughts in depression. *Cognit Ther Res* 16: 309-328.
20. Kwon SM, Oei TPS (1994) The roles of two levels of cognitions in the development, maintenance and treatment of depression. *Clin Psychol Rev* 14: 331-358.
21. Oei TPS, Hibberd E, O'Brien AJ (2005) Study of the integrated cognitive model of depression among Latin-Americans. *Aust N Z J Psychiatry* 39: 932-939.
22. Oei TPS, Kwon SM (2007) Evaluation of the integrated cognitive model of depression and its specificity in a migrant population. *Depress Anxiety* 24: 112-123.
23. Beck, AT (1970) The core problem in depression: The cognitive triad. In Masserman, J.H. (eds.), *Depression: Theories and Therapies*. Grune & Stratton Press, New York, pp. 47-55.
24. Hankin BL (2010) Personality and depressive symptoms: Stress generation and cognitive vulnerabilities to depression in a prospective daily diary study. *J Soc Clin Psychol* 29: 369-401.
25. Barnett PA, Gotlib IH (1990) Cognitive vulnerability to depressive symptoms among men and women. *Cognit Ther Res* 14: 47-61.
26. Conway CC, Slavich GM, Hammen C (2015) Dysfunctional attitudes and affective responses to daily stressors: Separating cognitive, genetic, and clinical influences on stress reactivity. *Cognit Ther Res* 39: 366-377.
27. Reilly LC, Ciesla JA, Felton JW, Weitlauf AS, Anderson NL (2012) Cognitive vulnerability to depression: A comparison of the weakest link, keystone and additive models. *Cogn Emot* 26: 521-533.
28. Yeoh SY, Wilkinson P (2014) Acute psychosocial stress does not increase dysfunctional attitudes. *Psychiatr Danub* 26, Suppl 1: 240-245.
29. Cheng SY, Jacob WJ (2012) Expansion and stratification of higher education in Taiwan. *Chinese Society and Education* 44: 102-120.
30. Chou CP (2015) Who benefits from Taiwan's mass higher education? In: Shin, J.C., Postiglione, G.A., Huang, F. (eds.), *Mass Higher Education Development in East Asia Vol. 2 of the Series Knowledge Studies in Higher Education*, p: 231-243.
31. Ying C (2014) A study on the equity of higher education opportunity in Taiwan. Tamkang University Institutional Repository p: 247-284.
32. Ying C, Yang KS, Liu HH, Huang CK (2012) Examining the education equity reality after higher education expansion in Taiwan. *Journal of Higher Education* 7: 1-35.
33. Brugha TS, Cragg D (1990) The List of Threatening Experiences: The reliability and validity of a brief life events questionnaire. *Acta Psychiatr Scand* 82: 77-81.
34. Ku YL (2008) A test of competing models to predict suicidality in patients and students in Taiwan. Doctoral dissertation, The University of Adelaide, SA, Australia.
35. Power MJ, Katz R, McGuffin P, Duggan CF, Lam D, et al. (1994) The Dysfunctional Attitude Scale (DAS): A comparison of Forms A and B and proposals for a new subscaled version. *J Res Pers* 28: 263-276.
36. Beckham EE, Leber WR, Watkins JT, Boyer JL, Cook JB (1986) Development of an instrument to measure Beck's cognitive triad: The Cognitive Triad Inventory. *J Consult Clin Psychol* 54: 566-567.
37. Beck AT, Steer RA, Brown GK (1996) *Beck Depression Inventory – (2nd edn): Manual*. The Psychological Corporation, USA.
38. Chinese Behavioral Science Corporation (2000) *Beck Depression Inventory – (2nd edn) (Chinese Version): Manual*, Taiwan.
39. Kline RB (2011) *Principles and practice of structural equation modeling*. Guilford Press, New York.
40. Shiffler RE (1988) Maximum Z score and outliers. *Am Stat* 42: 79-80.
41. Preacher KJ, Rucker DD, Hayes AF (2007) Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behav Res* 42: 185-227.
42. Aiken LS, West SG (1992) *Multiple regression: Testing and interpreting interactions*. Choice Reviews Online 29: 29-3352.
43. Chen JJ (2009) Factors of influencing the hierarchy of gender in undergraduates' fields of study. *Bulletin of Educational Research* 55: 35-67.
44. Kuan PY (2015) *Taiwan Education Panel Survey and Beyond: Results publication*.

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