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Self-Efficacy Triggers Psychological Appraisal Mechanism for Mindset Shift

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ABSTRACT

This paper talks about how to insist staying in changed mindset based on the assigned cognitive reframing principles, and finally the changed mindset become a forever psychological status by PSI model proposed by this study. P is the cognitive reframing principle of positive psychology, happiness in this case; S is self-efficacy, which plays the important role in maintaining the stress taker to psychologically stay in the changed mindset in the long run. I represent of insisting power, the mental toughness to against the adverse negative emotions. Improving university students' stress coping skills through the psychological dynamics formed by cognitive reframing principles of positive psychology, self-efficacy, and mental toughness will help them effectively deal with stressful events. This study aims to reduce university students' stress level by increasing their ability to cope with stress, and improving their life satisfaction by understanding the mechanism for mindset-shift of university students and proposal of the new PSI reframing model for creating a new path to let students view stressors as challenge, not hindrance. Theories adopted in this study include cognitive reframing principles, appraisal theory, hindrance-challenge theory, cognitive reframing the schema. In the introduction section, the authors will clearly depict the logics for utilization of these theories in supporting the proposed PSI model. This research was divided into two studies. Study 1 postulated that cognitive reframing principles of positive psychology, self-efficacy, and mental toughness have a positive mediating effect in the causal relationship between university students' stress level and life satisfaction. Findings revealed that stressful life events negatively predict the level of LS. Also, PP, SE, and MT exert a positive and significant impact on the relationship between stressful life events and LS. PP strengthens individuals' perception of stressful life events as challenges instead of hindrances. This study showed that individuals need to think positively and develop self-efficacy in order to generate mental toughness when confronted with challenges from stressful life events, and needs to have self-efficacy and confidence towards cognitive reframing principles of positive psychology in their mind, and finally form a mental toughness competence to protect the newly changed mindset in the long run.

KEYWORDS

Life satisfaction; mental toughness; cognitive reframing principles; positive psychology; self-efficacy; stress



1 Introduction

Stress is a natural phenomenon that occurs as a response to change; this is especially common among adolescents, and demands consumption of emotional and cognitive [1]. Due to economic and technological changes, work-related stress has increased [2] affecting individuals' cognitive and mental state. Previous studies have sought ways to help and support university students in combatting emotional and mental stress [3]; since they are most often exposed to high levels of stress and are at risk for developing mental illness due to academic and non-academic factors such as family issues and peer pressure. These lead to psychological distress [4] and decreased life satisfaction. Holmes et al. [5] observed that stressful life events are significantly associated with incidence of illness, such as asthma [6], requiring urgent and continuous care; they also noted that stress could be used to predict the onset of a disease.

Based on the results of [7] meta-analysis and systematic review of existing evidence, the efficacy of stress reappraisal interventions on stress responsivity does exist. Although the collected evidence is variable. However, the authors, at the beginning, proposed the effectiveness of efficacy of cognitive reframing stress-related information through brief reappraisal interventions for reducing stress. At its conclusion, Liu et al. [7] indicated heterogeneous effects suggesting large variability in findings; therefore, the authors suggest an avenue for the effective management of self-reported stress and optimization of stress responses as the future studies. This paper help serves as a supportive self-reported evidence in indicating self-efficacy's performance in stress intervention in terms of cognitive reframing. In this case, a person would to change, because he has already found cognitive reframing principles such as PERMA for changing mind. However, it is not easy to stay in the new framed schema or the mood and intention for change continuously, because an individual's mood and attention for changing could be varied every day, owing to the daily changing environment, events, tasks and relationship around us.

Different from traditional mind change theory, this paper talks about how to insist staying in changed mindset based on the assigned cognitive reframing principles. How we create a psychological status that help us insist in changing our mind, and finally the changed mindset become a forever psychological status? This is the research purpose of this paper.

2 Literature Review

2.1 Appraisal Theory

The research on appraisal theory was initiated by Magda Arnold in the 1940s, and conducted by Richard Lazarus in the 1970s. The concepts of appraisal theory is that: when things take place, people will appraise and assess the events against different criteria, and then have emotional arousal based on the appraisal results [8,9]. If one changes the appraisal, one can change how he/she feels. Taking this study as the case, while in the stress, cognitive reframing is to help individuals changing appraisal and assessing contents and results. Through stress reappraisal interventions on stress responsivity, people will appraise stressors as challenges instead of hindrance.

2.2 Cognitive Reframing

A frame is an unquestioned schema, beliefs, concepts, unspoken assumptions and values that people to infer meanings in a concrete manner. To cognitively reframe is like to a new frame of mind by challenging the existing beliefs, assumptions and values, look at things in different new ways [10–13]. cognitive reframing principle is the new perspectives, persuasions, values, and beliefs used to change the individual's existing frame.

2.3 Schema

Schemas, sometimes being understood as mental models, concepts, mental representations and knowledge structures, containing various elements such as a hierarchy, is like a conceptual filter, that affects our beliefs and values in making decisions and classifying things. People make observations,

evaluate and predicts things, especially in the process of cause-effect inferences by using their favourite schemas/perspectives [14–17].

Based on the literature review results, this study proposes a PSI model (Fig. 1). In Fig. 1, we can see three concepts respective in a logical layout. P represents of cognitive reframing principles—Cognitive Reframing of the schema; S represents of self-efficacy for maintaining and following cognitive reframing principles—Confidence and self-efficacy in accepting the new frames (required by cognitive reframing in terms of accepting other people’s frames); I represent of insisting Competence and power: Mental toughness to insist. Following has the details. And by new appraisal system (cognitive reframing references of positive psychology in this case), stress takers will change their mind, easier to view hindrance stressor as challenge stressor, and the change can stay long (see Fig. 2).

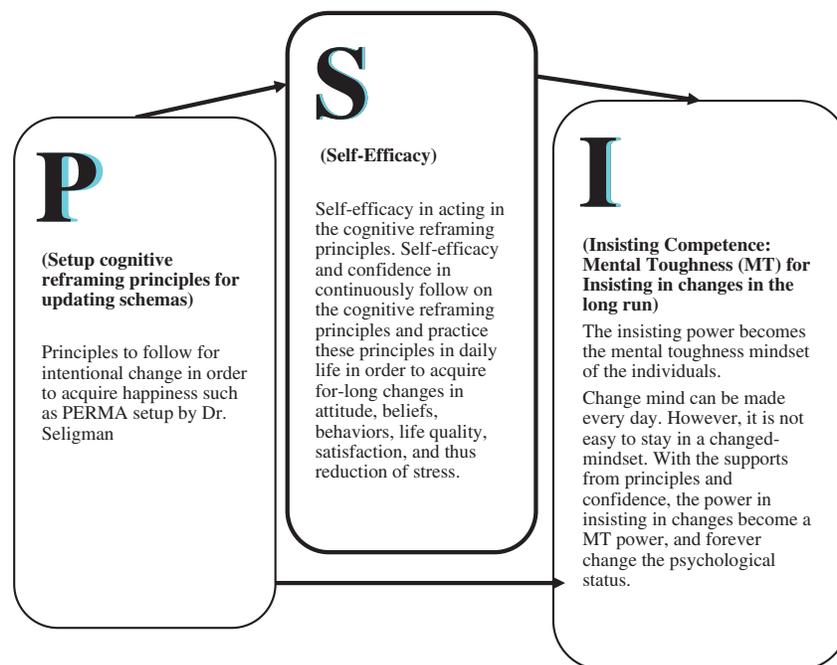


Figure 1: PSI Model for consistently change of mind

2.4 P: Cognitive Reframing Principles—Cognitive Reframing of the Schema

Cognitive reframing principles: A new sets of principles that lead into new frame that works as guidance of new behavioral pattern for persons who have stress. Cognitive behavioral therapy offers one way to re-interpret things and event, that cognitive reframing, that helps transform negative events into more positive ones. In this case, PERMA serves as cognitive reframing principles; to live on those cognitive reframing principles, people need to be confidence about what they believe; so that we set up self-efficacy to be the mediator to measure its level and cognitive reframing principles (Seligman’s PERMA principles to approach happiness) level together and both variables’ influence on the mental toughness. The results indicate to be significant. Therefore, we assume that people have cognitive reframing principles and they are confident about their cognitive reframing principles so they have competence in handling stressor [18], which is the generation of mental toughness power in this case, in handling negative stressors and emotions in a continuum pattern, which we name it PSI, in which the whole mindset is operated like a stable and concrete psychological status in the long run that help individuals to continuously and insist to keep going and changing their mind.

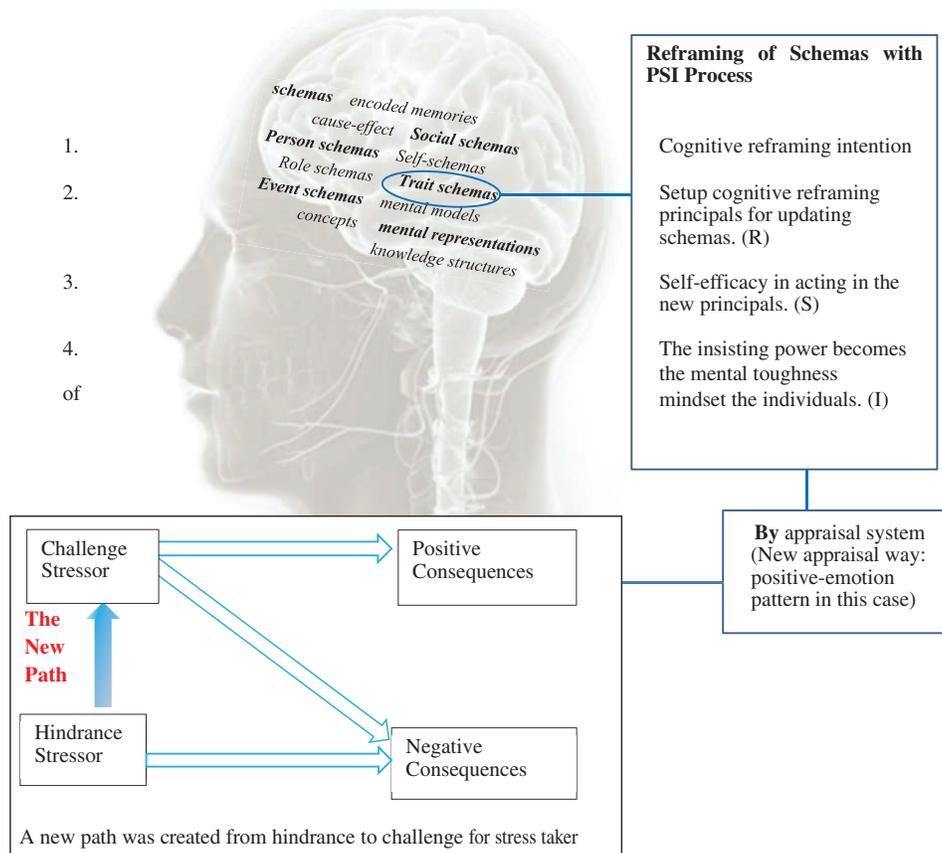


Figure 2: Theoretical concepts of this study

2.5 S: Self-Efficacy for Maintaining and Following Cognitive Reframing Principles: Confidence and Self-Efficacy in Accepting the New Frames (Required by Cognitive Reframing in Terms of Accepting Other People's Frames)

Self-efficacy in acting in the cognitive reframing principles. Self-efficacy and confidence in continuously follow on the cognitive reframing principles and practice these principles in daily life in order to acquire for-long changes in attitude, beliefs, behaviors, life quality, satisfaction, and thus reduction of stress. Self-efficacy functions in cognitive reframing: Many theories only provide a guiding principle, including the way to change mind and how to change, but what this study would like to provide is something different, that is, a long-run psychological state that people can insist in order to change their schema. The psychological state must be changed for some patients. At what point those patients can persist in making changes? Self-efficacy plays a key role. When the stress-taker has confident, he believes that what he is doing is right, power will be generated, and it will be easier for stress takers to persist in making changes.

2.6 I: Insisting Competence and Power: Mental Toughness to Insist

How people can insist in changing and no returning back to the old psychological status according to the body memory and intuition which represent of the old thinking path and patterns in the brain which is easier to come back as people were in the childhood or in the young age, or say, people were educated in that old thinking path and patterns and they have experienced and used to adopt that old thinking path and patterns in

the brain; but changing mind is like creating a new thinking path in their brain, which is more uncomfortable and challenging to people. Thus, insistence is hard but very important, that needs a competence called mental toughness to help and work on it. Insisting competence, which is the mental toughness to help individuals self-demanding in staying in the psychological status built up by the new principles. The insisting power becomes the mental toughness mindset of the individuals. Change-mind can be made every day. However, it is not easy to stay in a changed-mindset. With the supports from principles and confidence, the power in insisting in changes become a MT power, and forever change the psychological status.

2.7 Life Satisfaction (LS) and Stress

Life satisfaction is an overall assessment of feelings and attitudes about one's life at a particular point in time ranging from negative to positive (Buetell, 2006) [19]. Zheng et al. [20] indicated that stress is negatively related to adolescent life satisfaction. Using boundary integration theory, Yasir et al. [21] found that boundary integration, such as family relationship, can promote life satisfaction among female nursing staff. Moreover, Schalembier [22] revealed that life satisfaction is affected by income inequality, suggesting that individuals' level of satisfaction is sometimes based on comparison with others. Athay et al. [23] measured university students' life satisfaction in six dimensions, including: (1) Family life, (2) Social life, (3) University experience, (4) Oneself, (5) Place of residence, and (6) Overall life. Consequently, Aufegger et al. [24] found that auditioning leads to a wide range of physical and mental stress responses for musicians. These studies confirmed that psychological and physical responses to stress are common among individuals; thus, this study believes that stressful life events could lead to reduced life satisfaction, especially of university students, and proposes the following:

H1: Stressful events have a negative impact on university students' life satisfaction (LS).

2.8 Cognitive Reframing Principles of Positive Psychology (PP)

Cognitive reframing principles of Positive Psychology, which is happiness in this case, was first introduced by Seligman et al. [25,26]. As opposed to negative psychology, it is defined as the study of the strengths and virtues that enable people to thrive [27], with the belief that people should live a meaningful and fulfilling life to develop their full potential and have enhanced experiences of love, work, and play [28]. Positive psychology focuses on positive emotions, positive experiences, positive environments, and human strengths and virtues [29]. Keyes et al. [30] suggested that positive psychology should aim at rising to life's challenges, engaging with other people, finding fulfillment, looking beyond oneself, and helping others find lasting meaning to life, satisfaction, and wisdom; which are summed up in the PERMA concept (positive emotion, engagement, positive relationships, meaning of life, and feeling of accomplishment). Since cognitive reframing principles of Positive Psychology helps individuals generate a powerful mindset against stress and could potentially increase life satisfaction, this study proposes the following:

H2: Cognitive reframing principles of Positive Psychology (PP) positively moderates the relationship between stressful life events and life satisfaction (LS) of university students.

2.9 Self-Efficacy (SE)

Albert Bandura has defined self-efficacy as one's belief in one's ability to succeed in specific situations or accomplish a task. One's sense of self-efficacy can play a major role in how one approaches goals, tasks, and challenges [31]. This belief strongly affects how the person approaches his goal [32–35] and equips one with coping capabilities. That is to say, if an individual believes that he is capable of learning to play the piano then, he or she will be willing to learn to play the piano despite it being a difficult task. Bandura [36] suggested that individual behaviour is influenced by efficacy expectation and outcome expectation of one's cognition. Further, Bandura's self-efficacy theory described four different influential procedures,

including the dimensions of performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal. Based on this, the following is proposed:

H3: Self-efficacy (SE) positively moderates the relationship between stressful life events and life satisfaction (LS) of university students.

2.10 Mental Toughness (MT)

Crust [37] has defined mental toughness as “a mentally tough individual would exhibit different patterns of reactivity to standardized stressors, than would a less tough individual” [37]. Cowden et al. [38] suggested that mental toughness is a perceptual and psychological characteristic. According to Gerber et al. [39], a high stress level is positively related to burnout, which can be prevented with the help of mental toughness as a moderator. In their study, Mental Toughness Questionnaire was used, and the results showed that students with higher level of perceived stress and lower level of mental toughness score reported higher burnout level. Haghghi et al. [40], also used MTQ to test the moderating effect of mental toughness on mental health outcomes such as depression, anxiety, burnout, and insomnia. The results indicated that people with higher level of mental toughness was associated with less mental health complaints; thus, it was suggested that mental toughness can be helpful as a health intervention among university students. Moreover, Clough et al. [41] clearly indicated that mental toughness, a personality trait, could improve one’s confidence in dealing with stress and challenges, allowing one to view adversity as an opportunity and not as a threat, and to take a positive approach when facing challenges. Accordingly, this study proposes the following:

H4: Mental toughness (MT) positively moderates the relationship between stressful life events and life satisfaction (LS).

2.11 Mindset-Shift through the Mediating Effect of Self-Efficacy (SE) on the Relationship between Reframing Principles of Positive Psychology (PP) and Mental Toughness (MT)

To understand the psychological appraisal mechanism in mindset-shift, this study investigated the relationships among cognitive reframing principles of Positive Psychology (PP), self-efficacy (SE), and mental toughness (MT) in Study 2. The succeeding paragraphs discuss the rationale in combining the three moderating variables into a continuum of mindset-shift.

2.11.1 PP Positively Appraises Confronted Stress

Lazarus [42] and Travers et al. [43] emphasized the importance of perception in the process of coping stress. Individuals undergo a mindset-shift procedure when they struggle with a stressful and straining life event that could result in decreased LS. The procedure begins with a struggle in overcoming an adversity, which is viewed as the challenge described in the CH (Challenge and Hindrance) Stressors Model. The CH framework assumes that the effects of stressors depend on individual appraisal results, with stressors being gains or constraints [44]. Flinchbaugh et al. [45] also indicated that hindrance stressors diminish appraisals of LS, and challenge stressors promote LS. People handle stress through the cognitive appraisal process; thus PP is treated as a moderator in the relationship between stressful events and LS. A positive mindset helps individuals view challenge stressors positively at the initial stages.

2.12 SE is an Important Mediator for Enhancing the Psychological Capital of an Individual’s Mindset Such as MT

This study considered individuals with a high level of PP to hold a positive attitude in dealing with stress, allowing them to appraise stressful events as challenges. A positive-evaluation mindset involves emotional arousal in engaging in PP, resulting in individuals living a meaningful life with enhanced

feeling of accomplishment (dimension of SE); this feeling of accomplishment and increased sense of meaning becomes an enriching experience, resulting in an even higher SE.

2.13 SE from MT Needs Impetus of PP

Mental toughness added with self-confidence in dealing with stress [46] proves the importance of SE as a mediator between PP and MT. Positive ideas and self-concept formed in PP, needs the impetus of SE to become part of MT; however, SE needs impetus of PP. The present study suggests that individuals tend to lower their stress level, as an intrinsic need to pursue autonomy, by confronting the challenges/hindrances to increase LS and obtain an autonomous life. In order to conquer difficulties, competences and self-confidence (SE) must be increased by taking difficulties as challenges, not hindrances. Viewing things in a positive manner triggers the appraisal process of treating hindrances as learning opportunities, which helps increase competences and SE in coping with stress. Self-efficacy, embodied in emotional stability and self-confidence, allows one to deal with stress; it is then transformed as part of one's mindset, thereby strengthening one's MT. This results in a more efficient way of coping stress and enhanced level of LS. Therefore, this study proposes four additional hypotheses (H5 to H8) to understand the process of mindset-shift in coping with stress. These four hypotheses were tested using Structural Equation Modeling (SEM).

H5: Cognitive reframing principles of positive psychology (PP) significantly impacts self-efficacy (SE).

H6: Self-efficacy (SE) significantly impacts mental toughness (MT).

H7: Cognitive reframing principles of positive psychology (PP) significantly impacts mental toughness (MT).

H8: Self-efficacy (SE) mediates the relationship between cognitive reframing principles of positive psychology (PP) and mental toughness (MT).

3 Method

3.1 Research Framework

Based on the literature review and hypotheses proposed, this study developed its conceptual research framework shown in [Fig. 3](#).

3.1.1 Study 1

The causal relationship between stressful life events and LS, and the impacts of moderators, including PP, SS, and MT on the relationship between stressful life events and LS were investigated and verified using SPSS regression analysis method.

3.1.2 Study 2

The dynamic relationship, which is the mediating effect of SE on the relationship between PP and MT, is explored and verified using SEM method.

3.2 Participants and Questionnaire Design and Measurement

3.2.1 Participants

Descriptive and comparative research designs were utilized in this study. A total of 175 university students from 3 mid-size technology universities located in mid Taiwan were recruited as participants and were asked to answer a survey questionnaire. Out of 175, 135 data samples were returned and considered valid. Participants were either in their second- or third year in the university, aged between 21 and 23 years old, mostly females (n = 98), and majority were taking English Literature and Marketing Management.

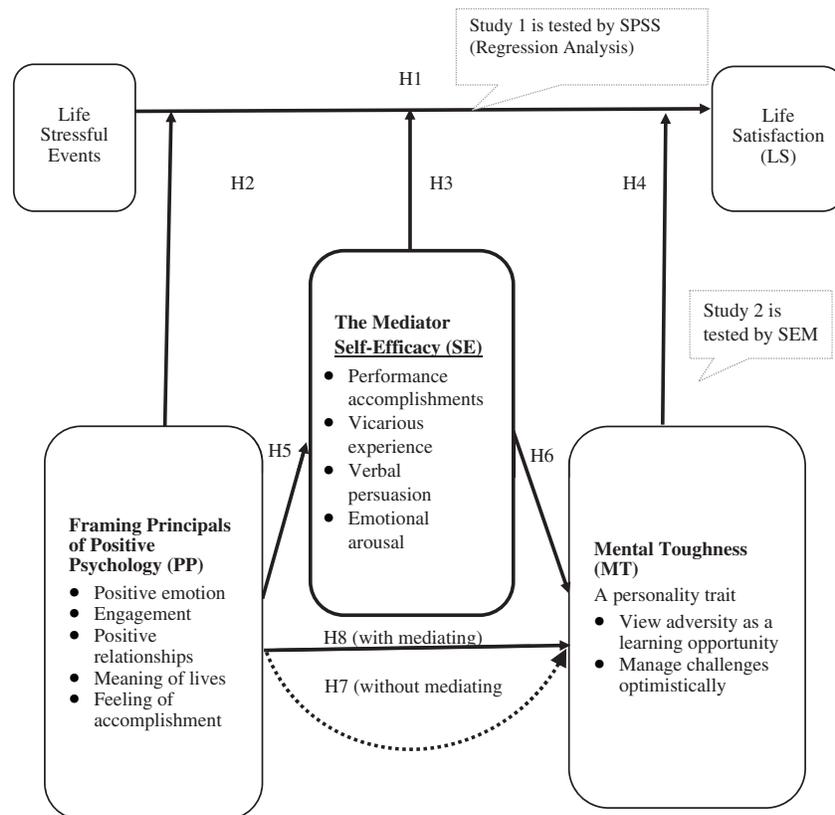


Figure 3: Exploration of psychological appraisal mechanism in self-transformation to adopt stress through the mediating of self-efficacy on the relationship between positive psychology and mental toughness

3.3 Questionnaire Design and Measurement

The research questionnaire has five main variables. These are explained in detail below. Social Readjustment Rating Scale (SRRS). Holmes et al. [47] developed the Social Readjustment Rating Scale (SRRS) to yield the number and types of stressful life events that lead to a cluster. SRRS offers quantitative basis for predicting a variety of quantitative values assigned to each stressful event [48–50]. It is one of the most widely cited instruments for measuring life stress in literature [51].

3.3.1 Life Satisfaction (LS)

Based on literature review, definitions of LS, previously developed LS scale [52,53], Multi-Dimensional Students' Life Satisfaction Scale (BMSLSS), and other factors that influence Asian university students' LS level, this study developed 9 items to measure participants' LS level, rated using a 5-point Likert scale (1 represents extremely disagree and 5 represents extremely agree).

3.3.2 Reframing Principles of Positive Psychology (PP)

The items for measuring PP were based on literature review, ideas of cognitive reframing principals of positive psychology extended from the central concepts of PERMA ideas, and definitions of PP. A total of 9 items were developed: (1) being committed to do things, (2) being energetic and active, (3) having confidence in oneself, (4) being optimistic about the future, (5) being joyful, (6) being grateful, (7) feeling appreciated, (8) showing interest in things confronted, and (9) having an acceptable attitude towards past events. The items were also rated using a 5-point Likert (1 represents extremely disagree and 5 represents extremely agree).

3.3.3 Self-efficacy (SE)

This study adopted the General Self-Efficacy Scale by Schwarzer et al. [54] to measure participants' level of SE.

3.3.4 Mental Toughness (MT)

The 18-item version of MTQ developed by Clough et al. [47] was adopted in this study to measure the participants' level of MT.

4 Results

4.1 Descriptive Analysis, Reliability and Correlation Analysis

The results of the descriptive analysis (N = 135) are shows the mean and standard deviation (SD) for each variable are as follows: LS (M = 33.81, SD = 6.90); stressful life events (M = 224.89, SD = 178.95); SE (M = 53.04, SD = 8.61); PP (M = 30.79, SD = 6.85); and MT (M = 48.99, SD = 7.73). Meanwhile, the reliability test results are: LS (0.750), stressful life events (0.831), SE (0.908), PP (0.928), and MT (0.906). All values obtained are within the acceptable range (>0.70). The Pearson's correlational analysis results showed that LS and stressful life events (LSE) ($r = -0.17^*$, $p < 0.05$), PP & LS ($r = 0.72^{***}$, $p < 0.001$), SE & LS ($r = 0.61^{***}$, $p < 0.001$), MT & LS ($r = 0.52$, $p < 0.001$), SE & PP ($r = 0.75^{***}$, $p < 0.001$), MT & PP ($r = 0.70^{***}$, $p < 0.001$), and MT & SE ($r = 0.79^{***}$, $p < 0.001$) are all significantly correlated.

4.2 Moderating Effects of PP, SE, and MT on the relationship between LS and Stressful Life Events

This This study used SPSS for Hierarchical Multiple Regression (HMR) to test the moderating effects of SE, PP, and MT on the relationship between LS and stressful life events. To prevent multivariate covariance, the Mean Centering was adopted to adjust the values of independent variables and moderators for further computation of interaction terms. The test results of Model 1 showed that stressful life events has a significant and negative impact ($\beta = -0.19$, $p < 0.05$) on LS ($F = 5.16$, $p < 0.05$) with a 3.7% explanation power in the negative direction ($\beta = -0.19$, $p < 0.05$). This means that when participants have a high level of stress, their LS level will decrease; therefore, H1 is supported.

When PP was added in Model 2 as a moderator, the resulting R2 reached a significant level ($\Delta F = 132.72$, $p < 0.001$) with a 48.3% explanation power in the positive direction ($\beta = 0.72$, $p < 0.001$). Moreover, when the interaction effect by stressful life events multiplied by PP was added in the third mode of HMR, R2 also reached a significant level ($\Delta F = 10.71$, $p < 0.01$). This means that PP exerts a moderating effect on the relationship between stressful life events and LS; therefore, H2 is supported.

When SE was added as a moderator in Model 2, R2 also reached a significant level ($\Delta F = 73.49$, $p < 0.001$) with a 34.4% explanation power in the positive direction ($\beta = 0.60$, $p < 0.001$). Further, when the interaction effect by stressful life events multiplied by SE was added into the third mode of HMR, R2 also reached a significant level ($\Delta F = 7.35$, $p < 0.01$). This means that SE exerts a moderating effect on the relationship between stressful life events and LS; therefore, H3 is also supported.

When MT was added as a moderator in Model 2, the value of R2 also reached a significant level ($\Delta F = 45.04$, $p < 0.001$) with a 24.5% explanation power in the positive direction ($\beta = 0.50$, $p < 0.001$). Consequently, when the interaction effect by stressful life events multiplied by MT was added into the third mode of HMR, R2 obtained also reached a significant level ($\Delta F = 6.95$, $p < 0.01$). This means that MT exerts a moderating effect on the relationship between stressful life events and LS; therefore, H4 is supported. The overall results are illustrated in [Tab. 1](#).

Table 1: The moderating effect analysis result of PP, SE, and MT on the relationship between LS and life stressful events

Variables	Dependent variable: LS						
	Model 1		Model 2			Model 3	
	X	M1	M2	M3	M1	M2	M3
	β	β	β	β	β	β	β
Independent variable (X: Life stressful events)	-0.19*	-0.02	-0.09	-0.13	-0.25**	-0.28**	-0.31**
Moderator (M1: Positive Psychology)		0.72***			0.71***		
Moderator (M2: Self-Efficacy)			0.60***			0.58***	
Moderator (M3: Mental Toughness)				0.50***			0.49***
Interaction Term (X \times M1)					0.30**		
Interaction Term (X \times M2)					–	-0.26**	
Interaction Term (X \times M3)							-0.26**
ΔR^2	0.037	0.483	0.344	0.245	0.036	0.033	0.036
ΔF	5.16*	132.72***	73.49***	45.04***	7.35**	10.71**	6.95**
Δp	0.025	0.000	<0.001	<0.001	0.008	0.001	0.009
R^2 (Final)	0.037	0.520	0.382	0.282	0.414	0.556	0.318
F (Final)	5.16*	71.49***	40.73***	25.96***	30.91***	54.74***	20.40***
p (Final)	0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Note: β is the standardized regression coefficient; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

4.3 The Mediating Effect of SE on the Relationship between PP and MT Verified Using SEM

In this study's model (N = 135), SE was assumed as the mediator, PP as the latent independent variable, and MT as the latent dependent variable. The SEM was utilized to explore the causal relationship among the three moderators: PP, SE, and MT (H5, H6, H7, and H8), and AMOS 22.0 with Maximum likelihood (ML) was used for estimation. The results of the model fit after adjustment, which is represented with a variety of indicators, are shown in Tab. 2. The obtained values for SRMR (0.071), RMSEA (0.077), CFI (0.870), PGFI (0.624), and χ^2/df (1.793) are all within acceptable range, thereby supporting the measurement model proposed by this study.

Tab. 3 shows the results of construct reliability and convergent validity. All factor loadings and convergent validity are within the acceptable range [55]. The construct reliability obtained is between 0.90 to 0.94, which is above the acceptable standard of 0.60 [56,57]. Also, the average variation extracted of the latent variables SE, PP, and MT are 0.63, 0.46 and 0.40 respectively; this means that the observational variable highly contributes to the influence of the latent variable. Although PP and MT have a lower influence level than SE, the results are still within the acceptable range.

In addition to the classic theoretical verification procedure proposed by Baron et al. [58], this study utilized the significance test of indirect effect, the Bootstrapping method proposed by Shrout et al. [59] to further compute the sampling variability of the indirect effect for obtaining a new confidence interval during the process of re-sampling.

Table 2: Analysis result of the overall model fit of the measurement models

Goodness-of-Fit indicators	Good fit	Observed model	Appraisal
Absolute fit index			
Likelihood-Ratio χ^2	$p > 0.05$	1100.852($p < 0.001$)	Poor
df	–	614	–
GFI	≥ 0.90	0.714	Poor
SRMR	≥ 0.08	0.071	Good
RMSEA	≤ 0.08	0.077	Good
Incremental fit index			
NFI	≥ 0.90	0.750	Poor
NNFI	≥ 0.90	0.859	Fair
IFI	≥ 0.90	0.871	Fair
CFI	≥ 0.90	0.870	Fair
Parsimony fit index			
PGFI	≥ 0.50	0.624	Good
PNFI	≥ 0.50	0.691	Good
PCFI	≥ 0.50	0.802	Good
Likelihood-Ratio χ^2/df	≤ 3 or ≤ 5 (marginal)	1.793	Good

Note: The indices of model fit refers to Huang (2007); Modification index (MI), releasing of PE3 ↔ PE7, PE4 ↔ SE2, MQ1 ↔ MQ22, MQ3 ↔ SE7, MQ41 ↔ MQ42, MQ42 ↔ MQ51, MQ81 ↔ MQ82, SE1 ↔ SE12, SE8 ↔ SE9, SE11 ↔ SE12, SE35 ↔ SE36, SE36 ↔ SE37, the 12 parameters of residual covariance.

Table 3: The analysis results of construct reliability and convergent validity

Latent variable	Observational variable	Std. factor loading	<i>t value</i>	R^2	CR	AVE(%)
Self-efficacy	SE1	0.66	–	0.43	0.90	0.40
	SE2	0.61	6.55***	0.38		
	SE3	0.71	7.43***	0.51		
	SE4	0.81	8.23***	0.65		
	SE5	0.80	8.16***	0.64		
	SE6	0.75	7.74***	0.56		
	SE7	0.79	8.16***	0.63		
	SE8	0.70	7.26***	0.48		
	SE9	0.71	7.40***	0.51		
	SE10	0.83	8.45***	0.70		
	SE11	0.27	2.96***	0.07		
	SE12	0.19	2.00***	0.03		
	SE13	0.39	4.26***	0.15		
	SE14	0.35	3.80***	0.12		
	SE15	0.36	3.94***	0.13		

(Continued)

Table 3 (continued).

Latent variable	Observational variable	Std. factor loading	<i>t value</i>	R^2	CR	AVE(%)
Positive Psychology	PP1	0.76	–	0.57	0.94	0.63
	PP2	0.88	10.98***	0.77		
	PP3	0.85	10.59***	0.73		
	PP4	0.82	10.18***	0.67		
	PP5	0.78	9.62***	0.61		
	PP6	0.77	9.36***	0.59		
	PP7	0.79	9.69***	0.63		
	PP8	0.85	10.58***	0.72		
	PP9	0.62	7.32***	0.38		
Mental Toughness	ME1	0.63	–	0.39	0.92	0.46
	ME21	0.49	5.17***	0.24		
	ME22	0.41	5.13***	0.17		
	ME3	0.78	7.51***	0.60		
	ME41	0.56	5.76***	0.31		
	ME42	0.78	7.48***	0.60		
	ME51	0.83	7.84***	0.69		
	ME52	0.75	7.31***	0.57		
	ME61	0.80	7.65***	0.64		
	ME62	0.64	6.46***	0.41		
	ME7	0.53	5.46***	0.28		
	ME81	0.76	7.39***	0.58		
	ME82	0.74	7.22***	0.55		

Note: CR is Construct reliability; AVE is Average variance extracted; *** $p < 0.001$.

The path coefficient *a* shows that PP directly and significantly predicts SE in the positive direction ($\beta_s = 0.81$, $t = 6.95$, $p < 0.001$); therefore, H5 is supported. Consequently, the path coefficient *b* shows that after controlling PP, SE directly and significantly predicts MT in the positive direction ($\beta_s = 0.64$, $t = 4.50$, $p < 0.001$); thus, H6 is also supported. Further, the path coefficient *c* shows that PP directly and significantly predicts MT in the positive direction ($\beta_s = 0.77$, $t = 6.27$, $p < 0.001$); thus, H7 is supported.

The path coefficient $a \times b$ presents PP indirectly predicting MT through SE. This study adopted the Bootstrap method to validate the significance of this indirect predicting effect. Through 1,000 repetitive sampling, the confidence interval of bias-corrected (BC) was established. The test results showed that the unstandardized indirect effect $a \times b$ Bootstrap BC 95% confidence interval is 0.25–0.77, which does not pass through 0; also, *c* changed from 0.77 to 0.25 of c' , with c' being significant. The indirect effect and partial mediating effect are therefore significant since the three conditions of partial mediating effect indicated by Lazarus [8] were all satisfied. This supports the present study's H8, that SE exerts a partial mediating effect on the relationship between PP and MT (Tab. 4).

Table 4: Summary on the structural coefficient of mediating model

Path	Hypotheses	Ustd. coefficient β	T value/BC 95% CI	Std. coefficient β s	Normalized parameter estimates	Test results
Direct Effect						
c. Positive Psychology → Mental Toughness	H7	0.66	6.27***	0.77	0.77***	Sig.
c'. Positive psychology → Mental Toughness	H8	0.22	2.29*	0.25	0.52***	Sig.
a. Positive psychology → Self-efficacy	H5	0.71	6.95***	0.81	81***	Sig.
b. Self-efficacy → Mental Toughness	H6	0.63	4.50***	0.64	0.64***	Sig.
Indirect Effect§						
a × b		0.45	0.25~0.77	0.52		

Note: § uses 1,000 Bootstrap samples, biased corrected methods: 95% CI of unstandardized coefficient.

5 Conclusion

5.1 Theoretical Implications

To change existing schema by cognitive reframing activities. In this case, it is to find out suitable cognitive reframing principles, the principles for creating happiness, which were built up by Dr. Seligman. With self-efficacy keep, individuals will have confidence and self-efficacy in practicing that new cognitive reframing principles and finally becoming concrete behavior. Therefore, PSI model describe how to make sure the cognitive reframing results (new frame which helps update and expand the schema) can be concretely kept for long.

In this case, most of the university students who have experienced stresses may view stressors either challenges or hindrance. Through the PSI process proposed by this study, a new continuum will be formed, which help individuals create a new appraisal system. This new appraisal system also helps the individuals more likely to view hindrance stressor as challenge stressor. That is likely to lead individuals who often confronted stress in their daily life to enjoy higher level of positive consequences such as life satisfaction. Thus, the negative stress is no more such suffering construct to them. On the other hand, it is even some more challenging to them so that life could become more meaningful, which is part of the condition for positive emotion.

Also, the research results of this study showed that individuals need to think positively (strive for a meaningful life, uphold positive emotions, participate in engagements, experience feeling of accomplishment, and become involved in supportive relationships), and develop self-confidence (SE) to generate MT when confronted with challenges from stressful life events.

Previous studies have explored several mediating factors for independent and dependent variables; however, none have integrated and further investigated the relationships among the moderators. This study innovatively contributes in the research flow, including bionic technology, following the true flow of mindset by combining three moderators and examining their relationships through SEM. The significant partial mediating effect illustrates that individual's thinking pattern is generated from one idea to another; only one variable, PP, was found to be insufficient in helping individuals cope with stressful life events and in transforming hindrances into challenges. This study also found that SE plays an

important role in coping with stress. Individuals need to be confident in knowing that they have a correct and powerful mindset, which will result in MT continuously and positively appraising stressful events as challenges and not as hindrances, allowing them to handle challenges with confidence.

The present study also contributes to the theoretical development of stress management psychology with extensive connection to CH model, especially in the development of a comprehensive, positive appraisal mechanism. Cavanaugh et al. [60] proposed the CH model, which was used as a basis in this study. Based on the results, it was noted that PP could help people obtain a positive attitude and perceive struggles as challenges while appraising confronted stress. In addition to the mediating effect of SE, it was found that MT could support people's mindset-shift.

5.2 Practical Implications

With the rapid development and growth of the economy, internet technology, and environmental changes, individuals struggle to obtain good education and professional training from well-esteemed colleges and universities in order to increase competitiveness. This results in an overwhelming pressure from school, peers, and family, leading to stress. Adolescents aged between 18 and 24 studying in colleges and universities need to work hard in building new relationships, experience loneliness from being away from their families, and suffer from stress due to academic pressure. Beginning 1980s, it was found that university students' psychological problems are becoming more serious. Recent studies have shown that the mean age of university students suffering from bipolar disorder was lowered to 19 years old from 32 years old a century ago. Therefore, life adjustment methods need to be developed to help these students cope with stress and prevent mental health problems. The purpose of the present study was to determine the factors that influence the decrease in the stress level of university students to increase their life satisfaction despite the pressure they receive academically and non-academically. According to the results of this study, strengthening university students' stress coping skills through the psychological dynamics formed by PP, SE, and MT will help them effectively deal with stressful events, and will decrease the possibility of acquiring mental health problems; thus, reducing the possible expenditure in the national health insurance. Establishing an effective school support system is also another way of helping students cope with stress.

5.3 Research Limitations and Suggestions for Future Studies

Qualitative research study be done to have a comprehensive qualitative and quantitative assessment of the variables involved. Quantitative research method is good at measuring and confirming the path between dimensions statistically, but psychologists' practical understanding towards people's thinking pattern and dynamic mindset can be well illustrated using quantitative methods such as detailed interviews. Also, the sample size is students and the size are small, it is suggest that next study had better to use company sample with more than 200.

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