

## Relationships between Stages of Change and Self-Efficacy for Effective Stress Management in Chinese College Students

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### Abstract

The Transtheoretical Model of Behavior Change (TTM) has the potential to explain how Chinese college students can initiate and maintain effective stress management (any form of healthy activity, which is practiced to manage stress for at least 20 minutes per day). The TTM regards the process as progression through the following five stages of change: precontemplation (not ready), contemplation (getting ready), preparation (ready), action, and maintenance. Self-efficacy (confidence to manage stress effectively even under tempting situations) is assumed to increase with stage progression. Previous studies have found such relationships, but no study has examined these relationships with Chinese college students. The purpose of this study was to examine the relationship between stages of change and self-efficacy for effective stress management. The participants included 366 male and 505 female Chinese college students. The Chinese language version of Pro-Change's self-efficacy measure was developed based on item response theory. A single scale of 10 items was replicated. Self-efficacy was significantly higher in action and maintenance than in precontemplation and contemplation. Self-efficacy was also significantly higher in men than in women. These results provide initial evidence that the self-efficacy measure can be applied to stress management with Chinese college students.

**Keywords:** stages of change, self-efficacy, stress management, transtheoretical model

### 1. Introduction

Helping college students to manage stress represents an important social issue in China (Bao, Jia, & Zhao, 2009). With a primary prevention focus, it would be important to help students to engage in healthy stress management activities such as exercise, talking with others, or regular relaxation (Evers, Prochaska, Johnson, Mauriello, Padula, & Prochaska, 2006). In this study, effective stress management is defined as any form of healthy activity such as exercising, meditating, relaxing, and seeking social support, practiced to manage stress for at least 20 minutes (Pro-Change Behavior Systems, Inc., 2003). Unfortunately, around 40 percent of Chinese college students are not practicing effective stress management (Deng, Tsuda, Horiuchi, Kim, & Wu, 2012). To help them do so is a theory of behavior change that is needed (Deng, Tsuda, Horiuchi, & Matsuda, 2013a).

The Transtheoretical Model (TTM) (Prochaska & DiClemente, 1983) is one of the leading theories of behavior change. It describes the process as progression through the following five stages: precontemplation (not ready), contemplation (getting ready), preparation (ready), action, and maintenance. The model also indicates that increases in self-efficacy can cause stage transitions. Self-efficacy represents confidence in the ability to practice effective stress management under situations that tempt people not to practice it. To apply the model to stress management with Chinese college students, it is necessary to confirm predicted relationships between stages of

change and self-efficacy (Velicer, Prochaska, Fava, Norman, & Redding, 1998). Several previous studies have reported that greater confidence for practicing effective stress management is associated with later stages of change (Evangelia & Spiridon, 2011; Evers, Evans, Fava, & Prochaska, 2000; Horiuchi, Tsuda, Kim, Hong, & Prochaska, 2010; Padlina, Aubert, Gehring, Martin-Diener, & Somaini, 2001; Riley & Fava, 2003). An exception is the study of Nakamura (2009) which has reported no difference of self-efficacy across the stages. Those studies have supported the application of the construct, self-efficacy, to stress management. No study, however, has been reported from China. Due to the lack of such a study in China, it remains unclear whether those previous findings can be generalized to Chinese college students. Nishimura and Chikamoto (2005) pointed out the importance of examining external-validity of previous findings when the findings would be applied to other cultures.

The purpose of this study was to examine relationships between stages of changes and self-efficacy for effective stress management in Chinese college students. A Chinese language version of Pro-Change's self-efficacy measure for effective stress management (PSSM: Evers et al., 2000) was translated to achieve the purpose. PSSM is a single scale with 10 items. It was hypothesized that self-efficacy for effective stress management would be higher in later stages of change than in earlier stages. The results of this study will provide initial insight on whether self-efficacy can be applied to effective stress management with Chinese college students.

## 2. Method

### 2.1 Participants

In the survey conducted from December 2008 to February 2009, data on stages, processes of change, decisional balance, self-efficacy, and depressive symptoms were collected. Three coupling papers have been reported using this data set. Those studies examined relationships of stages to depressive symptoms (Deng et al., 2012), decisional balance (Deng et al., 2013a), and processes of change (Deng, Tsuda, Horiuchi, & Matsuda, 2013b). This study reports the results of the analyses with regard to self-efficacy and its relationships to stages of change.

Data of 366 male and 505 female Chinese college freshmen were subject to the analyses. All students had reported stress over the past month. The average age was 19.62, with a standard deviation of 4.83 years. The students were recruited during or after lectures and only those who agreed to participate in the survey completed questionnaires. The stage of change distribution was: precontemplation = 10.56%, contemplation = 15.38%, preparation = 16.30%, action = 38.12%, and maintenance = 19.63%.

### 2.2 Measures

#### 2.2.1 Self-Efficacy

PSSM (Evers et al., 2000) was translated into the Chinese language for this study, with permission from Pro-Change Behavior Systems, Inc. It lists 10 specific situations that may make it difficult to maintain effective stress management. For example, these situations included "When I am depressed" and "When I have problems in a relationship." The degree of confidence in those specific situations was rated using a 5-point Likert scale that ranged from 1 = not at all confident to 5 = very confident.

#### 2.2.2 Stages of Change

Stage of change of each participant was assessed using the Chinese language version of Pro-Change's staging algorithm (Deng et al., 2012). The algorithm asked respondents whether they had been stressed or not. If the respondents had been stressed, they were further asked whether they effectively manage stress in their daily life. They chose one of the five items representing the five stages: (1) "No. I have no intention to begin in the next six months." (precontemplation); (2) "No. But I intend to begin in the next six months." (contemplation); (3) "No. But I intend to begin in the next month." (preparation); (4) "Yes. I have been practicing for less than six months." (action); or (5) "Yes. I have been practicing for at least six months." (maintenance). Validity was confirmed by demonstrating that relations to decisional balance (Deng et al., 2013a) and processes of change (Deng et al., 2013b) were consistent with the predictions.

### 2.3 Statistical Analyses

The analyses were conducted with SPSS 11.5 for Windows. Significance was set as  $p < .01$ . To examine if the Chinese language version of PSSM consisted of one factor, as the original measure an exploratory factor analysis using the maximum-likelihood method was conducted. The number of factors was fixed at one, due to its confirmatory nature. All ten items were assumed to be highly loaded on the factor. Items were expected to represent a factor if their factor loadings would be at or above .40. Using the same approach, Horiuchi, Tsuda, Prochaska, Onitsuka, Kobayashi, and Umeno (2011) found that the portion of the variance was around .40.

Cronbach's alpha coefficient was calculated for internal consistency reliability. Evers et al. (2000) reported that the alpha coefficient of the original PSSM was .89. Then, we examined the differences in mean values for the decisional balance for effective stress management across the stages using a two-way analysis of variance (ANOVA). Self-efficacy should be put in an analysis as the independent variable. However, this study aimed to examine whether there would be significant relationships between self-efficacy and stages of change. In most previous cross-sectional studies based on the model, self-efficacy was put in the analyses as a dependent variable.

### 3. Results

#### 3.1 Measure Development

The factor analysis was conducted to examine whether ten items consisted of one factor. All items were highly loaded with factor loadings being above .40. The portion of variance explained was 35.45. The alpha coefficient was .84.

#### 3.2 Relationships between Stages and Self-Efficacy

The ANOVA was conducted with Tukey's post-hoc tests with stage as the independent variable. It revealed significant effects of stage ( $F(4, 861) = 9.69, p < .01$ ) and sex ( $F(1, 861) = 22.68, p < .01$ ). No significant interaction effect was found ( $F(4, 861) = 1.39, n.s.$ ). The results of post-hoc comparisons indicated that the scores of self-efficacy were significantly higher in action and maintenance than in precontemplation and contemplation (all,  $p < .01$ ). Men rated significantly higher on self-efficacy than women.

Table 1. Factor loadings of items of the Chinese language version of PSSM\*

Item	
If things are not going the way I want	-3.62
If I am in poor health	-3.55
If I am frustrated	-2.68
If I am anxious	-1.75
If I am depressed	-1.72
If I have deadlines to meet	-3.49
If I have financial problems	-4.46
If I have problems in relationships	-3.54
If a friend or family member is upset with me	-3.51
If I experience increased workload at work/school	-3.56

Note. PSSM= Pro-Change's self-efficacy measure for effective stress management

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Table 2. Means and standard deviations of self-efficacy scores across stages of change

Stages of change	Men	Women	Total
Precontemplation	30.26±6.32	27.37±5.86	28.72±6.22a
Contemplation	29.58±5.77	29.02±5.45	29.25±5.57a
Preparation	32.49±5.12	29.00±5.19	30.75±5.42
Action	32.28±6.44	30.90±6.19	31.43±6.31b
Maintenance	33.85±6.50	31.50±6.16	32.49±6.39b

Note. Different symbols represent significant differences between the symbols ( $p < .01$ ).

#### 4. Discussion

The purpose of this study was to examine relationships between stages of changes and self-efficacy for effective stress management with Chinese college students. The hypothesis, which stated that self-efficacy for effective stress management would be higher in later stages of change than in earlier stages, was largely supported. As hypothesized, patterns of increased self-efficacy with stages advancement were confirmed. The results of this study extend the literature by providing initial evidence supportive of the application of self-efficacy to stress management with Chinese college students. Studies reporting predicted relationships between stages of change and self-efficacy have been reported from other countries, but it had been unknown whether this would be true in China. Nishimura and Chikamoto (2005) suggested that it is important to examine external-validity of findings in some cultures when the findings are applied to other cultures. This study found predicted relationships between stages of change and self-efficacy for effective stress management in Chinese college students. Therefore, it was suggested that self-efficacy can be applied to effective stress management in this new population.

This study also resulted in the confirmation of the translated to Chinese self-efficacy measure. The Chinese language version of the PPSM was a single scale with 10 items. The measure was found to be highly reliable with the alpha coefficient being .84. This level of internal consistency was compatible to that of the original measure (Evers et al., 2000). The measure will provide an important tool for assessing self-efficacy with Chinese researcher and practitioners. With this relatively short measure, sophisticated analyses of the model can be conducted. In addition, it can be used as an indicator in TTM based interventions. Such interventions target self-efficacy as well as other variables such as processes of change and decisional balance. Until this study, no Chinese language measure of self-efficacy for effective stress management had been available. The development of the Chinese language version of PSSM successfully addressed this limitation and it is expected that the measure will be used in future studies, with permission from Pro-Change.

In conclusion, the results of this study provide evidence supportive of the applicability of the self-efficacy construct to effective stress management with Chinese college students. Helping college students to manage stress represents an important issue for China (Bao et al., 2009). The results helped us to see that the TTM may be useful for understanding the process of the initiation and maintenance of effective stress management. Despite such strengths, this study included some limitations. First, the participants were recruited at one college and it remains unclear how representative the participants were as a sample of Chinese college students. The extent to which the findings of this study can be generalized needs to be determined. Second, it is unclear whether the Chinese language version of PSSM would be appropriate for populations other than students. It is needed to examine populations other than students.

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