Published in final edited form as:

Soc Indic Res. 2014 January 1; 115(1): 337–361. doi:10.1007/s11205-012-0222-6.

Developing the Psychological Strain Scales (PSS): Reliability, Validity, and Preliminary Hypothesis Tests¹

Jie Zhang, Ph.D.² [Professor],

Shandong University School of Public Health, China, and SUNY College at Buffalo, USA

Juncheng Lu, Ph.D. [Student],

Weifang Medical University and Shandong University School of Public Health, China

Sibo Zhao, Ph.D. [Student],

SUNY University at Buffalo, USA

Dorian A. Lamis, Ph.D.,

Emory University School of Medicine, Atlanta, GA, USA

Ning Li, Ph.D.,

Peking University, China

Yuanyuan Kong, Ph.D.,

Beijing Friendship Hospital, China

Cunxian Jia, Ph.D.,

Shandong University School of Public Health, China

Li Zhou, Ph.D. [Associate Professor], and

Dalian Medical University, China

Zhenyu Ma, Ph.D. [Assistant Professor]

Guangxi Medical University, China

Abstract

Since its inception, the Strain Theory of Suicide has been tested and supported in a number of empirical studies. This social psychological theory can be employed as a complementary conceptualization to account for suicidal behaviors as well as mental disorders. However, the lack of consistent measurements of the strains limits the application of the theory in scientific research. Our research team has developed such scales for future testing of the Strain Theory of Suicide in a more systematic approach. For the initial items to measure the four strains (value, aspiration, deprivation, and coping), we solicited approximately 40 items for each strain with high face validity by about 30 fellow researchers. A preliminary examination of about 160 items for

¹The research was supported by the United States National Institute of Mental Health (NIMH): R01 MH68560. We thank Dr. Yeates Conwell of University of Rochester for his special constructive comments and suggestions on the manuscript development. We also thank many of those collaborators who have contributed to the study by providing strain items and/or critical and constructive comments on the study but are not listed as co-authors on this published paper.

²Correspondence should be directed to Professor Jie Zhang, Ph.D., Department of Sociology, State University of New York College at Buffalo, 1300 Elmwood Avenue, Buffalo, New York 14222, USA. Phone: 716-878-6425; FAX: 716-878-4009; zhangj@buffalostate.edu.

Authors Contributions: Dr. Jie Zhang conceptualized the theoretical frame, designed the study, implemented Test 1, and wrote up the paper. Mr. Juncheng Lu implemented the survey for Test 2, did statistical analyses for the Tests 1 and 2 data and wrote part of the findings section. Ms. Sibao Zhao participated in the initial item solicitation, did the data analysis for Test 1, and facilitated the final submission of the manuscript. All other co-authors contributed to the initial lists of strain items and provided critical and constructive comments to the study as well as the manuscript.

consistency and validity, with a sample of about 300 college students, yielded 20 consistent items for each of the four strain scales. Then, a second study was conducted at a different university with approximately 500 students to further streamline each of the four strain scales and test the validity of each with corresponding established scales and variables. As a result, 15 items were selected for each of the four Psychological Strain Scales (PSS). In correlation and multiple regression analyses, we found support for the hypotheses regarding the positive associations between psychological strains measured by the PSS and psychopathology including suicidal ideation. Follow up research with the new scales needs to be carried out in order to test the effects of psychological strains on suicide and mental disorders for various populations.

Keywords

Psychological Strain; Reliability; Validity; Mental Disorder; Suicide

The Strain Theory of Suicide emerged as an additional theoretical conceptualization to explain the unique patterns of Chinese rural young female suicide (Zhang 2005). Since its inception, the Theory has been tested and supported in a number of empirical studies, such as with a Chinese rural young case control sample (Zhang et al. 2009; Zhang et al. 2011), an American suicide notes sample (Zhang and Lester 2008), and a content analysis of the suicides in a famous Chinese novel (Yan, Zhang and Zhao 2012), to name a few. This social psychological theory can be employed as a complementary conceptualization to explain suicidal behaviors as well as mental disorders. However, the lack of consistent measurements of the strains limits the application of the theory in scientific research to some extent. Our research team has developed such scales for future testing of the Strain Theory of Suicide in a more systematic approach.

The Strain Theory of Suicide

A strain is different from a simple stress. A strain consists of at least two stressors, either pulling or pushing an individual in different directions. A single directional stress is usually less devastating to an individual's psychological wellbeing than a strain. A person may have experienced numerous stresses but not many strains. A strain can result from any of the following conflicts: (1) two differential cultural values, (2) discrepancies between aspiration and reality, (3) perceived differences between one's own status and that of others, and (4) a crisis situation and lack of coping abilities. As the cognitive dissonance theory suggests, strain is a psychological frustration or even suffering that one struggles to find a solution to reduce or eliminate. But in truth, it is more serious, frustrating, and threatening than cognitive dissonance because major cultural value systems may be involved. The extreme solution for a strain may be crime (outward frustration-aggression route) or suicide (inward frustration-aggression route).

The strain theory of suicide is based on the theoretical frameworks established by previous sociologists on criminal behaviors, such as Durkheim (1951), Merton (1957), and Agnew (2006). For the strain theory of crime, the violence resulted from social structural and psychological strains is outward (Agnew 2006), and for the Strain Theory of Suicide, the social structural and psychological strains turn the violence inward, both aiming at releasing the psychological tensions (Freud 2002) that has been built up with the strains. Again, a psychological strain has to consist of two and at least two conflicting social facts, and if the two social facts are non-contradictory, there would be no strain. For the Strain Theory of Suicide and mental disorder, there are four types of strains, each of which can be derived from specific sources, and can precede suicidal behavior or mental disorder onset. The four

strains are (1) value strain, (2) aspiration strain, (3) relative deprivation strain, and (4) coping strain.

Cognitive Dissonance and Psychological Strain

Cognitive dissonance is caused by holding two or more inconsistent notions or ideas or by the discrepancy between one's own behaviors and values (Festinger 1957). It was discovered that dissonance is most powerful and most upsetting when people behave in ways that threaten their self-image. This is upsetting because it forces people to confront the discrepancy between who they think they are and how they have in fact behaved (Aronson 1998). Festinger and Aronson (1960) suggested three options to reduce this dissonance: (1) To change our behavior in order to bring it in line with the dissonant cognition, (2) To attempt to justify our behavior through changing one of the dissonant cognitions, or (3) To attempt to justify our behavior by adding new cognitions (Festinger and Aronson 1960). Strain, in its psychological impact, could be even more pathogenic, powerful, and devastating than the cognitive dissonance, and the reduction of strain may require something beyond the above three options for cognitive dissonance. Again, the built-up strains and their consequent tensions, if not timely reduced or released otherwise, could lead to crime (outward releasing) or mental disease (inward releasing) including suicide.

Strain and Moderator/Mediator

Strain may lead to negative emotions and/or mental disorders including substance abuse and alcohol abuse, and may precede other deviant behaviors such as property crimes and personal assaults (Merton 1957). In the relation between strain and suicide, negative emotions and mental disorders may be mediators, providing a mechanism in addition to the direct link between strain and suicide. On the other hand, the relations between strain and suicide may be moderated by social integration, social regulation, and psychological factors such as personality. An individual well integrated into a social institution such as family, religion, school, and employment, may be at lower risk of suicide, even when confronting a major strain (Durkheim 1951; Stack 2000; Stack and Wasserman 1995). The mediators and moderators in the model should play important roles in determining the probability of suicide resulting from strain. They could be the factors that to some extent help distinguish individuals who experience any type of strain and commit suicide from those who experience the same type of strain but do not commit suicide.

Strain Source 1: Differential Values

When two conflicting social values or beliefs are competing (e.g., personal beliefs internalized in the person's value system) in an individual's daily life, the person experiences value strain. A cult member may experience strain if the mainstream culture and the cult religion are both considered important in the cult member's daily life. Other examples include the second generation of immigrants in the United States who have to abide by the ethnic culture's rules enforced in the family while simultaneously adapting to the American culture with peers and school (Chung 2011). In China, rural young women appreciate gender egalitarianism advocated by the communist government, but at the same time, they are trapped in cultural sexual discrimination as traditionally cultivated by Confucianism (Kung, Hung and Chan 2004). Another example that might be found in developing countries is the differential values of traditional collectivism and modern individualism (Chang, Wong and Koh 2003). When the two conflicting values are taken as equally important in a person's daily life, the person experiences great strain (Kemmelmeyer et al. 2003). When one value is more important than the other, there is little or no strain.

Strain Source 2: Reality vs. Aspiration

If there is a discrepancy between an individual's expectation or a high goal and the reality the person has to live with, the person experiences aspiration strain. The two conflicting social facts are one's splendid ideal or goal and the reality that may prevent one from achieving it. Many individuals living in the United States expect to be very rich or at least moderately successful as other Americans do, but in reality the means to achieve the goal is not equally available to the person because of his/her social status or other reasons (Merton 1957). For example, someone's goal is to get accepted into a desired college or marrying the ideal spouse, but the reality indicates that it is impossible. Consequently, the person experiences an aspiration strain. Another example from rural China is that a young woman aspiring to equal opportunity and to be treated equally may have to live within the traditional and Confucian reality, exemplified by her family and village, which interferes with that goal (Zhang 2010). The larger the discrepancy between aspiration and reality, the greater the strain will be.

Strain Source 3: Relative Deprivation

In the situation where an economically poor individual realizes that other people of the same or similar background are leading a much better life, the person experiences deprivation strain. The two conflicting social facts are one's own miserable life and the perceived richness of comparative others. A person living in absolute poverty, where there is no comparison with others, does not necessarily feel bad, miserable, or deprived (Easterlin et al. 2010). On the other hand, if the same poor person understands that other people like him/her live a better life, he or she may feel deprived because of these circumstances. In an economically polarized society where the rich and poor live geographically close to each other, people are more likely to feel this discrepancy and strain, and as a consequence, crimes (outwardly reducing the strain) (Mazerolle, Piquero and Capowich 2003) and suicide (inwardly releasing the tension) (Zhang et al. 2011) are likely to be committed. In today's rural China, television, newspaper, magazines, and radio have brought home to rural youths how relatively affluent urban life is compared to their lives. Additionally, those young people who went to work in the cities (*dagong*) and returned to the village during holidays with luxury materials and exciting stories make the relative deprivation even more realistically perceived (Zhang et al. 2010). Increased perception of deprivation contributes to relatively greater strain for individuals.

Strain Source 4: Deficient Coping

Almost everyone has experienced life crisis, but some individuals are unable to cope with the problem, and, in turn, experience coping strain. The two conflicting social facts are life crisis and the appropriate coping capacity. All people who have experienced crises do not experience strain. A crisis may be a pressure or stress in daily life, and those individuals who are not able to cope with the crisis have strain. Such crises as loss of money, loss of status, loss of face, divorce, death of a loved one, etc. may lead to serious strain in the person who does not know how to cope with these negative life events (Heikkinen et al. 1995). A high school boy who is constantly bullied and ridiculed by peers may experience great strains if he does not know how to deal with the situation (Kim et al. 2009). Likewise, a Chinese rural young woman who is frequently wronged by her mother-in-law may encounter strain if she is not psychologically ready to cope with a different situation by seeking support from other family members and the village (Zhang 2010). The less capable the coping skills, the stronger the strain when a crisis occurs.

Conceptualization of the Psychological Strain Measures

Value Strain

When an individual experiences a psychological strain resulting from social values or beliefs, there must be two or more conflicting and internalized values. The individual regards the conflicting values or beliefs equally important and cannot afford giving up either. For example, the conflicting social values can be from any of these dichotomies: (1) traditionalism and modernity for status of women, (2) traditionalism and modernity for love and marriage affairs, (3) religion and atheism, (4) Chinese values and Western values, and (5) Altruistic education and market economy, etc.

Aspiration Strain

The larger the discrepancy between one's aspiration or expectation in daily life and the reality the person is in, the stronger the aspiration strain is. Voluntarily reducing the expectation and bringing it closer or equal to the reality can decrease the aspiration strain. A person who experiences the aspiration strain usually compares his reality with his own past and future, which is a self-comparison rather than an external comparison. An aspiration strain can be found in the following life situations: (1) marriage partner selection, (2) education attainment, (3) job choice, (4) social and political achievements, and (5) choice of belief, etc.

Deprivation Strain

This is a psychological strain caused by relative poverty or relative deprivation. The sheer poverty without any comparison is not detrimental to one's psychological wellbeing. This deprivation is not only economic in nature, but everything for people to achieve, including any type of opportunities. A person who experiences deprivation strain usually compares what he has with what others have, which is an external comparison rather than a self-comparison. An individual may feel deprived in any of the following sectors of social life: (1) low income compared to others, (2) lack of chances for finding a marriage partner, (3) lack of chances for education, (4) lack of chances for free belief; (5) lack of chances for being employed, (6) lack of chances for social life, etc.

Coping Strain

Coping strain is a psychological frustration for an individual facing some crisis but being unable to deal with it. It can be measured by lack of coping skills when one encounters a crisis life event. The deficient coping skills of people can be found in any of the following situations: (1) loss of the job, (2) loss of money (investment), (3) loss of property, (4) loss of loved ones, (5) loss of face (dignity), (6) physical accident, (7) marriage disruption, (8) failure at school, (9) trouble at work, and (10) interpersonal problems, etc.

Study One: Methods and Findings

Open Solicitation of Strain Items

We began soliciting items early in the summer of 2012. About 30 research collaborators and graduate assistants in both China and the US were approached to suggest items for the development of the Psychological Strain Scales (PSS). All the participants understood the conceptualization of the Strain Theory of Suicide and the construct for each of the strains as discussed above. Most of the participants are conversant with both Chinese and English. They were asked to provide as many scale items as possible in either English or Chinese or both following selected criteria below:

1. Face validity: Each of the four scales has its own construct distinguishable from others.
2. Brevity: Chinese and English versions should be easy to understand for less educated people and the two versions should match.
3. Culture-free: It has to be accomplished as much as we can. In case of necessity, N/A should be used for certain items.
4. Avoidance of double-barreled statement: In each item there should be only one target for the response.
5. Mutual exclusiveness: the four scales should be mutually exclusive, but some items from different scales maybe overlapping.
6. Similarity: The occurrence of similar items, especially with opposite direction, is allowed.

Among the large amount of items written by the invited participants, approximately 40 were selected for each of the four strains based on the face validity screening by the core group of the research teams and the principal investigator. The 160 or so items together with several demographic variables, such as gender, age, social economic status of the family, religion, political affiliation, parents' education, rural/urban residence, and whether only child, were composed in to a single questionnaire for survey.

Measurements

The 40 or so items in each proposed strain scale were translated and back translated between English and Chinese a number of times by bilingual experts on our research team, until every single item in Chinese was satisfactorily fit to its corresponding item in the English version. Response options included: 1=absolutely disagree, 2=disagree, 3=maybe but not sure, 4= agree, and 5=totally agree.

The demographic information from the questionnaire is limited to the life of college students in China. Marital status is assessed by three options: 1=single, 2= in love, and 3=married or cohabitating. As none of undergraduate students in the samples were married, we coded the marital status variable to 0=single and no relationship and 1=in a relationship but unmarried. Religious identity was assessed by the following choices: 1= atheist, 2= Daoist, 3=Islamic, 4=Protestant, 5=Catholic, 6=Buddhist, and 9=others. This variable on religion was then coded into 0=no religion (atheist) and 1=have a religion. Political affiliation was measured by 1=Communist Party member, 2=Communist League member, 3=Communist Party membership applicant, 4=other party member, and 5=no party affiliation. This variable was recoded into 0=Communist Party member and 1=Not Communist Party member. Health status was assessed by 1=very bad, 2=poor, 3=average, 4=good, and 5=excellent. It was recoded to 0=bad or average and 1=good or excellent. Education of parent was evaluated by seven choices: 1=no education or dropout of elementary school, 2=elementary school finished, 3=middle school, 4=high or vocational school, 5=college or university, 6=graduate school with a Master's degree, and 7=graduate school with a doctoral degree. The education for father and mother respectively was recoded to 0=no education or less than college and 1=college or above. Given that all participants were college undergraduate students, age was not a variable to be considered in the analysis. Table 1 illustrates the demographic variables and their new coding.

Administration of the First Survey to College Students

Approximately 300 college students were randomly selected from a university in Beijing China for the item screening study. Administrative approval was obtained from the

university leadership and its Institutional Review Board (IRB) before the sampling and administration of the questionnaire survey to ensure the protection of human subjects. The respondents were aged from 18 to 22 years and randomly selected from all the four years of grade standing. The anonymous questionnaire was administered in a paper and pencil format.

Data Analysis: Selection of the 20 Items for Each of the Four Scales

The analyses of the data from the sample with Study One include face validity screening, consistency tests, and factor analyses. Experts were invited to review the 40 or so items in each strain scale. The experts, who were psychologists, psychiatrists, sociologists, epidemiologists, and social science methodologists, were all familiar with the strain theory of suicide. They reviewed each of the 160 or so items in consultation with each other. Some items that did not have good face validity were either replaced or revised.

Item-total statistics was performed on each of the 40 or so items. Certain items were considered for deletion by the correlation coefficient values. As a result, an item was deleted if its correlation coefficient with the whole scale of about 40 items was smaller than 0.30.

A factor analysis was conducted with the remaining items. Initially, we tested the application condition of factor analysis by KMO and Bartlett's Test. In the factor analysis we used Varimax orthogonal rotation to make the factor meaning more obvious, and ensured the cumulative contribution rate was more than 60%. We deleted those items which had a factor loading smaller than 0.45, or if the items did not clearly indicate the meaning assigned to the scale. Then, we selected 20 items for each scale. Please see the Appendix for the 20 items selected for each of the four scales. The factor analysis results demonstrated strong construct validity of each scale. The factor loading information can be seen in Table 2 through Table 5.

Cronbach's Alpha coefficient was used to evaluate the internal consistency reliability of each strain scale and the sum of the four scales. Table 6 shows the consistency alpha values for the scales and the total scale. The total scale alpha was 0.971 for the 20 items scales and 0.944 for the 15 item scales. Both are excellent indications for high reliability of the scales. Further, for each of the four scales either with 15 or 20 items each, the Cronbach's alpha was not smaller than 0.800. Please note that the selection of the 15 items for each scale out of the 20 is realized in Study Two as following described.

Study Two: Methods and Findings

Questionnaire Development

The questionnaire for Study Two was developed based on the findings from Study One. First, we included all of the 20 items selected in Study One for each of the four scales. We added four criterion measures into the questionnaire for validity tests for each of the four strains respectively. To take advantage of the survey among college students from the Chinese population, we also added measures as the dependent variables to test the hypothesis set off by the Strain Theory of Suicide and Mental Disorders.

Measurements

The demographic variables were identical to those in Study One. We added the criterion variables to test validity of the psychological strain scales. The Chinese cultural value strain scale has been used in previous studies as a measure of the psychological strain on differential values and has been well validated in Chinese youth (Zhang et al. 2011). It has 13 items with response choices from 1=strongly disagree to 5=strong agree. An example of

the items was: “How much do you agree or disagree on the issue that women have to stay at home without working outside?” Aspiration is simply measured by only one variable: “.... Have you had your wish realized? 0=No and 1=Yes.” Relative deprivation is assessed by the question “In comparison with people around you in the same community or village, your family economic status is 1=very good, 2=good, 3=OK, 4=poor, and 5=very poor. Moos’s Coping Response Inventory (CRI) (Moos et al. 1990) was employed as the coping skill criterion. We used its 24 items to assess coping skills and the choices range from 1=not at all to 4=fairly often. The Chinese version of the CRI scale has been validated for use in Chinese populations (Li and Zhang 2012). The scales of Chinese culture value strain and the CRI are both continuous variables, and the aspiration and relative deprivation variables are categorical.

We also assessed for the presence of psychopathology in Study Two in order to test the strain theory hypothesis. The Spielberger Trait-Anxiety Scale was used to measure the subjects’ anxiety level. The Trait Anxiety Scale which includes 20 items is half of Spielberger’s State-Trait Anxiety Inventory Form (STAI) (Spielberger 1983). The State Anxiety Scale, the second half of the inventory, also has 20 items. The STAI clearly differentiates between the temporary condition of “state anxiety” and the more general and long-standing quality of “trait anxiety.” In responding to the Trait-Anxiety Scale, subjects rate the frequency of the feelings on these four-point scales: 1=never, 2=sometimes, 3=often, and 4=always. The Chinese version of the scale has been validated in a Chinese sample and proved to be an excellent measure of trait anxiety in Chinese culture (Zhang and Gao 2012).

To assess the respondents’ depression level, we used the Center for Epidemiologic Studies – Depression Scale (CES-D) (Radloff 1977). The CES-D is a self-report scale, and it covers affective, cognitive, behavioral, and somatic symptoms associated with depression. The CES-D was originally developed for assessing depression symptoms and was specifically designed for research use in the general and non-clinical populations. It has 20 items, and for each of them respondents rate their own feeling for the number of days in the past one week: 1=less than one day, 2=1 to 2 days, 3=3 to 4 days, and 4=5 to 7 days. The Chinese version of CES-D has been validated with a number of Chinese samples and proved to be an excellent measure of depression in general Chinese populations (Zhang and Norvilitis 2002; Zhang et al. 2012).

Suicidal ideation was measured by the scale developed in Kessler’s National Comorbidity Survey (NCS) (Kessler et al. 2005). The scale has seven items, measuring a subject’s degree of suicidality from thoughts, plans, gestures, and attempts. For example, Item 1 asks if the subject has seriously thought about death, and the Item 2 asks if the subject has thought about it in the past 12 months. The scale was recoded to 0 if all responses to the seven items were no and 1 if any of the seven items is yes. The Chinese version of the Kessler NCS Suicidal Ideation Scale has been validated with some Chinese sample and proved to be an excellent measure of suicidality among general populations in China (Zhang and Zhou 2011).

Administration of the Second Survey to College Students

Study Two was conducted at a medical university in Shandong Province, China. The random cluster sampling method was used in the collection of the data. First, 10 classes were randomly selected from all of the undergraduate classes on campus. Then, the questionnaires were administered to the students in the selected classes, after informed consent was obtained. To ensure the quality of the data, a small group of graduate assistants were trained to administer the group survey. They went to the classrooms, obtained informed consent, distributed and collected the completed questionnaires while answering

any relevant questions, and making sure each survey was completed to the best of the respondent's ability.

The second round of the validation study was conducted to finalize the four scales by streamlining each to 15 items and testing the criterion validity for each of the four scales. Each of the four scales was tested for validity by correlating them with the established criterion. To further validate the scales, this Study Two also tested preliminarily hypotheses driven by the strain theory of suicide with anxiety, depression, and suicidal ideation as the dependent variables. Each of the four scales should be adjusted and refined accordingly based on the reliability and validity tests, and the final number of items in each scale is 15.

Selection of the Items for the Final Scales

A new round of consistency and factor analysis were performed on the Study Two data to streamline each of the four scales to 15 items out of 20 for each. Again, we used the Item-Total Statistics method and the Factor Analysis to simplify each strain scale. We used the Cronbach's Alpha to test the reliability of the simplified strain scale. Again, certain items were considered for deletion by the correlation coefficients. For example, an item was deleted if its correlation coefficient with the whole scale of 20 items was smaller than 0.30. As a result, five items were taken out of each scale. The items deleted from the list of 20 in each scale are

Value 4, 11, 13, 15, and 18

Aspiration 1, 2, 5, 6, and 14

Deprivation 6, 7, 10, 11, and 18

Coping 1, 2, 12, 13, and 14

Please refer to the Appendix to this paper for the items which are excluded from the list of 20 in each scale.

Factor analysis on each of the scales further supported the selection. The number of factors was reduced in the 15 item factor analyses, the conceptualization of the factors in each scale was more focused than it was in the earlier factor analyses, and the cumulative contribution of each scale was about 60%–70%. The factor analysis results for the 15 items scales are showed in Tables 7–10. Results indicated that the construct validity of each simplified scale was good. The Cronbach's Alpha coefficient of the total four scales changed from 0.971 in the previous 20 items scales to 0.944 in the current 15 item scales, as can be seen in Table 6. The overall reduction of the Alpha coefficient could be due to the decreased number of items in each scale.

A factor analysis with the 60 selected items (15 from each of the four scales) was then conducted to test the mutual exclusiveness of the four scales with the sample. It was found that 15 factors were extracted with the first four most salient. They were (1) deprivation, (2) aspiration, (3) coping, and (4) value, with the corresponding items exactly in each of them. The first four extracted factors included the majority of the items, and the rest of the items could be respectively assigned to them.

Criterion Validity Tests of Scales

As planned, the criterion items and scales included in the survey instrument were used for further validity tests. As illustrated in Table 11, we used the culture value scale from our previous studies as the criterion scale for the value strain scale, the item of wish in the questionnaire as the criterion for the aspiration strain scale, the family social economic status as the criterion for the deprivation strain scale, and the Moo's Coping Response

Inventory (CRI) as the criterion for our coping strain scale. The total score of each of the tested scales was found to be highly and significantly correlated with its corresponding criterion. All the strain scales have been proved to be highly valid for what they intend to measure.

Effects of Psychological Strains on Psychopathology: A Preliminary Investigation

A number of demographic information variables were included in the survey for Study Two, which allows for a possible test of the effects of the psychological strains on psychopathology among the college students under study. Some of the demographic variables were culture specific aimed at the Chinese college student populations. Many of the demographic variables were discussed earlier in the measurement section of this paper. Table 1 demonstrates the sample distribution on each of the demographic variables for Study One and Study Two respectively, and Table 12 shows the univariate analyses of psychopathology on each of the strains and the major demographic variables. Each of the psychological strains is significantly associated with each of the three psychopathologies: anxiety, depression, and suicidal ideation. We selected a number of demographic independent variables from the univariate analyses in Table 12 and included them in the next multiple regression analyses. Only those variables that had a two-tailed P value smaller than 0.15 in the bivariate analyses were selected for the next step of study.

The General linear and unconditional logistic regression models were tested to investigate to what extent the psychological strains predict mental disorders, such as anxiety, depression, and the suicide ideation in this sample. The odds ratio (OR) and the 95% confidence intervals (95%CI) were used to evaluate the effect size. A two-tailed p -value < 0.05 was considered statistically significant. In this regression analysis, the total scores of the four strains were converted into one total score. Table 13 presents the three regression models respectively for anxiety, depression, and suicidal ideation. As shown in Table 13, psychological strains successfully predicted anxiety, depression, and suicidal ideation separately with a P value < 0.001 in each of the three models.

A look at the demographic variables in the regression models shows that females are not more likely than their male counterparts to be anxious and depressed. The college students score higher on anxiety and significantly more suicidal if they are involved in a love relationship than those who are not. Religious people are more likely than non-religious people to be depressed. A Communist Party member is more likely than a non-Communist Party member to be depressed. As predicted, physically healthy students are less likely to be anxious, depressed, or suicidal. Students whose father was better educated tend to be less anxious. Students from urban areas tend to be less anxious or suicidal than their rural counterparts. Finally, if the student is the only child in the family, he or she is more likely to be mentally healthy. On the other hand, a student who has siblings tends to score high on the suicidal ideation scale.

Conclusions

The Strain Theory of Suicide and mental disorders is a relatively new theoretical concept accounting for the motivation of suicide and preconditions of mental disorders. It can be complementary to existing theories explaining suicidal behaviors, such as the sociological theorem using social integration and regulation (Durkheim 1951), the psychiatric model focusing on mental disorders (WHO 2002), and the interpersonal theory of suicide assessing the conditions of an individual before the suicidal act (Joiner 2005). However, unlike those existing theoretical frameworks, the Strain Theory of Suicide and mental disorders explains how the social structure and the individual response to the social structure lead to the suicidal mentality. On the other hand, the previous and existing models theorize the

conditions, after the suicidal mentality is formed, in which an individual eventually kills him/herself. For example, with a strong suicidal intent, an individual kills him/herself under the situation of (1) too little or too much social integration (Durkheim 1951), (2) being mentally disordered (WHO 2002), and (3) thwarted belongingness, perceived burdensomeness, and acquired capability for self-harm (Joiner 2005). The strain theory of suicide and mental disorder aims to identify the risk factors of suicide and mental disorder in the upstream or the first degree layer of prevention and contributes to the suicide etiology with its different perspective in the social structure and personality.

The Psychological Strain Scales (PSS) were developed and validated in two studies. First, we solicited a large amount of items from research collaborators and graduate students. Second, we further checked each of the items for its face validity with the theoretical conceptualization. Third, we tested the selected items with college student samples. Fourth, we streamlined and refined each scale based on the findings from the empirical tests. Then, we examined correlations for the finalized scales with their criterion variables to determine each scale's validity structure. Finally, we conducted some preliminary analyses to test the hypothesis generated from the Strain Theory of Suicide.

In Study One, we administered a questionnaire survey with the selected items (about 40 for each of the four scales: value strain, aspiration strain, deprivation strain, and coping strain) to a group of college students for the items' consistency tests. The item-total consistency and factor analysis on the items yielded 20 well fit items for each of the four scales. In Study Two, we administered the 20 selected items of each scale to another group of college students and then through consistency tests and factor analysis streamlined each scale to 15 final items. In Study Two, we also examined the criterion validity for each scale with the selected criterion variables or established scales. To verify the external validity of the psychological strain scales (PSS), three psychopathologies (anxiety, depression, and suicidal ideation) were tested as the dependent variables in general linear models with several demographic covariates and highly significant correlations were found between the strains measured by the PSS and the psychopathologies.

The findings exemplified in Table 13 strongly support the strain theory: psychological strains significantly predict college students' anxiety, depression, as well as suicidal ideation, even when controlling for several covariates. Further, as expected, females tend to be more anxious and depressed than males. On the other hand, not to the surprise of those who are familiar with the Chinese youth studies, marriage and religion, which are protective factors of suicide and mental disorders in the West, do not play the same role in the Chinese culture (Zhang 2010). Our data show that the college students who have been in a love relationship are more anxious than those who are intact with marital or love relationship. Also, the former tend to be more suicidal than the latter, although the association is not significant at the conventional 0.05 probability level. Those students who have claimed to have a religion are more anxious and depressed than those who do not have a religion. Also, contrary to the only child syndrome theory (Falbo and Polit 1986), the college students who were not the only child in their families tended to be more anxious than the only child in our sample. In sum, the major finding in the multi-variable regression models is that psychological strains are positively associated with college students' anxiety, depression, and suicidal ideation.

Limitations of the current studies and implications for future work on the validation of the Psychological Strain Scales (PSS) are notable. The scales were developed (conceptualized and written) in English but the Chinese versions were first tested in Chinese samples. Throughout the development and validation of the scales, our goal is to make all the items

culture free. After this successful validation, the finalized scales will need to be tested in English speaking populations.

It should be noted that the participants in both Study One and Study Two were college students, who are highly educated cohorts in Chinese societies. The selected 15 items in each of the four scales should be valid and reliable measures of psychological strains among Chinese college students. Another generalizability concern of the samples is that they are over represented by females, which is also the student gender structure in many Chinese universities especially the medical schools. The demographic differences in the samples between Study One and Study Two are representative of the two different campuses. Because of this, we were able to study and validate the scales in different college student cohorts.

Further validation tests should be performed in populations beyond college students, such as rural youths in China, to improve the external validity for each of the four 15-item scales. The English version of the scales also needs to be tested and validated in English speaking societies in the near future. Nonetheless, this project has provided a solid foundation for the systematic, quantitative, and standardized study of the strain theory of suicide and mental disorders.

References

- Agnew, Robert. General Strain Theory: Current Status and Directions for Further Research. In: Cullen, Francis T.; Wright, John P.; Blevins, Kristie, editors. *Taking Stock: The Status of Criminological Theory-Advances in Criminological Theory*. New Brunswick, NJ: Transaction; 2006. p. 101-123.
- Aronson, Elliot. Cognitive dissonance theory: Revival with revisions and controversies. In: Harmon-Jones, E.; Mills, JS., editors. *Dissonance, hypocrisy, and the self-concept*. Washington, DC: American Psychological Association; 1998. p. 21-36.
- Chang, Weining C.; Wong, Wing Keung; Koh, Jessie Bee Kim. Chinese values in Singapore: Traditional and modern. *Asian Journal of Social Psychology*. 2003; 6(1):5-29.
- Chung, Irene. Sociocultural study of immigrant suicide attempters: An ecological perspective. *Journal of Social Work*. 2011; 12(6):614-629.
- Durkheim, Emile. *Suicide: A Study in Sociology*. New York: Free Press; 1951. (Original work published in 1897).
- Easterlin, Richard A.; McVey, Laura Angelescu; Switek, Malgorzata; Sawangfa, Onnicha; Zweig, Jacqueline Smith. The happiness-income paradox revisited. *Proceedings of the National Academy of Sciences*. 2010; 107(52):22463-22468.
- Falbo, Toni; Polit, Denise F. Quantitative review of the only child literature: Research evidence and theory development. *Psychological Bulletin*. 1986; 100(2):176-189.
- Festinger, Leon. *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press; 1957.
- Festinger, Leon; Aronson, Elliot. The arousal and reduction of dissonance in social contexts. In: Cartwright, D.; Zander, A., editors. *Group Dynamics*. Evanston: IL: Row & Peterson; 1960. p. 214-231.
- Freud, Sigmund. *Civilization and Its Discontents*. London: Penguin; 2002. (Original work published in German in 1930).
- Heikkinen, Martti E.; Isometsä, Erkki T.; Aro, Hillevi M.; Sarna, Seppo J., et al. Age-related variation in recent life events preceding suicide. *Journal of Nervous and Mental Disease*. 1995; 183(5):325-331. [PubMed: 7745388]
- Joiner, Thomas. *Why people die by suicide*. Cambridge, MA: Harvard University Press; 2005.
- Kimmelmeier, Markus; Burnstein, Eugene; Krumov, Krum; Genkova, Petia; Kanagawa, Chie; Hirshberg, Matthew S.; Erb, Hans-Peter; Wiczorkowska, Grazyna; Noels, Kimberly A. Individualism, Collectivism, and Authoritarianism in Seven Societies. *Journal of Cross-Cultural Psychology*. 2003; 34(3):304-322.

- Kessler RC, Berglund P, Borges G, Nock M, Wang PS. Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. *Journal of the American Medical Association*. 2005; 293(20):2487–2495. [PubMed: 15914749]
- Kim, Young Shin; Leventhal, Bennett L.; Koh, Yun-Joo; Boyce, W Thomas. Bullying Increased Suicide Risk: Prospective Study of Korean Adolescents. *Archives of Suicide Research*. 2009; 13(1):15–30. [PubMed: 19123106]
- Kung, Winnie W.; Hung, Suet-Lin; Chan, Cecilia LW. How the Socio-cultural Context Shapes Women's Divorce Experience in Hong Kong. *Journal of Comparative Family Studies*. 2004; 35(1): 33–50.
- Li, Ziyao; Zhang, Jie. Coping Skills, Mental Disorders, and Suicide Among Rural Youths in China. *The Journal of Nervous and Mental Disease*. 2012; 200(10):885–890. [PubMed: 22986278]
- Mazerolle, Paul; Piquero, Alex R.; Capowich, George E. Examining the Links between Strain, Situational and Dispositional Anger, and Crime: Further Specifying and Testing General Strain Theory. *Youth & Society*. 2003; 35(2):131–157.
- Merton, Robert K. *Social Theory and Social Structure*. New York: Free Press; 1957.
- Moos RH, Brennan PL, Fondacaro MR, Moos BS. Approach and avoidance coping responses among older problem and nonproblem drinkers. *Psychology and Aging*. 1990; 5(1):31–40. [PubMed: 2180432]
- Radloff, Lenore Sawyer. The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1(3):385–401.
- Spielberger, CD. *Manual for the State-Trait Anxiety Inventory (Form Y)*. Palo Alto, CA: Consulting Psychologists Press, Inc.; 1983.
- Stack, Steven. Suicide: A 15-Year Review of the Sociological Literature, Part II: Modernization and Social Integration. *Suicide and Life-Threatening Behavior*. 2000; 30(2):163–176. [PubMed: 10888056]
- Stack, Steven; Wasserman, Ira. The Effect of Marriage, Family, and Religious Ties on African American Suicide Ideology. *Journal of Marriage and the Family*. 1995; 57(1):215–222.
- WHO, (World Health Organization). Geneva: World Health Organization; 2002. Multisite Intervention Study on Suicidal Behaviours SUPRE-MISS: Protocol of SUPRE-MISS.
- Yan, Shengming; Zhang, Jie; Zhao, Lin. Suicides in A Dream of Red Mansions: A Perspective of the Strain Theory of Suicide. *Journal of Shandong University (Philosophy and Social Sciences)*. 2012; 2012(1):139–147.
- Zhang, Jie. Conceptualizing a Strain Theory of Suicide (Review). *Chinese Mental Health Journal*. 2005; 19(11):778–782.
- Zhang, Jie. Marriage and Suicide among Chinese Rural Young Women. *Social Forces*. 2010; 89(1): 311–326.
- Zhang, Jie; Dong, Nini; Delprino, Robert; Zhou, Li. Psychological Strains Found From In-Depth Interviews With 105 Chinese Rural Youth Suicides. *Archives of Suicide Research*. 2009; 13(2): 185–194. [PubMed: 19363755]
- Zhang, Jie; Gao, Qi. Validation of the Trait Anxiety Scale for State-Trait Anxiety Inventory in Suicide Victims and Living Controls of Chinese Rural Youths. *Archives of Suicide Research*. 2012; 16(1): 85–94. [PubMed: 22289030]
- Zhang, Jie; Lester, David. Psychological Tensions Found in Suicide Notes: A Test for the Strain Theory of Suicide. *Archives of Suicide Research*. 2008; 12(1):67–73. [PubMed: 18240036]
- Zhang, Jie; Norvilitis, Jill M. Measuring Chinese Psychological Well-Being with Western Developed Instruments. *Journal of Personality Assessment*. 2002; 79(3):492–511. [PubMed: 12511017]
- Zhang, Jie; Sun, Weiwei; Kong, Yuanyuan; Wang, Cuntong. Reliability and validity of the Center for Epidemiological Studies Depression Scale in 2 special adult samples from rural China. *Comprehensive Psychiatry*. 2012; 53(8):1243–1251. [PubMed: 22520090]
- Zhang, Jie; Wiecek, William F.; Conwell, Yeates; Tu, Xin Ming. Psychological strains and youth suicide in rural China. *Social Science & Medicine*. 2011; 72(12):2003–2010. [PubMed: 21640457]
- Zhang, Jie; Wiecek, William F.; Conwell, Yeates; Tu, Xin Ming; Wu, Bill Yow Wu; Xiao, Shuiyuan; Jia, Cun Xian. Characteristics of young rural Chinese suicides: a psychological autopsy study. *Psychological Medicine*. 2010; 40(4):581–589. [PubMed: 19656428]

Zhang, Jie; Zhou, Li. Suicidal Ideation, Plans, and Attempts Among Rural Young Chinese: The Effect of Suicide Death by a Family Member or Friend. *Community Mental Health Journal*. 2011; 47(5): 506–512. [PubMed: 20623190]

Appendix

Items Selected by Study One (20) and Study Two (15) in both English and Chinese

Value Strain

Item No.	Content
Value 1	I am often confused about what life means to me. 生活的意义到底是什么，我经常对这一问题感到困惑。
Value 2	I am unsure about what is right and wrong regarding some things in my daily life. 生活中的许多事情我真不知道是对的还是错的。
Value 3	I don't know why my thoughts are often different from others. 不知道为什么我的想法经常和别人不一样。
Value 4	My parents and my best friends (peers) sometimes have different views on certain things, and I always find it difficult to deal with them. 有时我真不知道应该听父母的话还是听好朋友或者同伴的意见。
Value 5	Between socialism and capitalism economies, I don't know which is better for a society. 社会主义和资本主义之间，我真的不知道哪一个更好。
Value 6	I don't know if God really exists. 我对世上到底有没有神灵感到困惑。我真的不知道上帝到底存在不存在。
Value 7	Between democracy and totalitarianism, I don't know which is good for every society. 在民主和专制这两种社会制度之间，我不知道哪一种更适合于大多数社会。
Value 8	I don't know if women should have the same rights that men do. 我不知道妇女是否应该与男性享有同样的权力。
Value 9	Between traditional and modern values, I don't know what I should follow. 在传统价值观和现代价值观之间，我不知道我会倾向于哪个。
Value 10	Between chastity and sexual liberty, I don't know what I should do. 在节欲和纵欲之间，我不知道我应该遵循什么。
Value 11	It will be a difficult decision to make about whether I should take care of my parents when they are too old to take care of themselves. 当父母年老生活不能自理时，我不知道是否有责任把他们照顾起来。
Value 12	I admire those who are leading a very simple life and not thinking too much about life. 我真羡慕那些生活简单而无烦恼也不想太多的人。
Value 13	I don't understand why some church members are not liked by the government. 我不能理解为什么信教的人大多不被政府部门喜欢。
Value 14	I am always troubled by some conflicting ideas. 我经常被一些矛盾的思想所折磨。

Item No.	Content
Value 15	I am not living in the way I want, and I feel bad about it. 我并不是按照自己的想法在生活，这让我很痛苦。
Value 16	It is often difficult for me to make a decision between two choices. 经常很难在两个或多个选择中做决定。
Value 17	Between career and family, I don't know which is more important to me. 我不知道事业和家庭哪个更重要。
Value 18	It is difficult to decide if I should get more education. 究竟要不要接受更多的教育，我很难选择。
Value 19	In dating and marriage, I don't know if I should decide my own or listen to my parents. 关于恋爱结婚，我不知道应该听长辈的还是应该自己作主。
Value 20	The traditional values are always opposite to what I have learned from school, I cannot make a choice what to believe 中国传统文化中有很多与学校所学的知识是互相矛盾的，我难以从中做出选择。

Note: Items Value 4, 11, 13, 15, and 18 are deleted from the final 15 item value scale.

Aspiration Strain

Item No.	Content
Aspiration 1	There are certain things in my life I can never have, although I really want them. 生活中的很多东西，尽管我很想得到，但却是不可能的。
Aspiration 2	Society is not fair to me. 我认为社会对我不公平。
Aspiration 3	I wish I had a better job now, but I cannot realize it according to some reasons. 我希望我的工作比现在的要好。但是由于种种原因，我这个愿望实现不了。
Aspiration 4	I wish I were living in a better family, but I cannot realize it according to some reasons. 我希望我的家庭比现在的要好，但是由于种种原因，我这个愿望实现不了。
Aspiration 5	I wish I had a chance to get more education, but I cannot realize it according to some reasons. 我希望我有机会上更多的学，接受更多的教育，但是由于种种原因，我这个愿望实现不了。
Aspiration 6	I wish I had more power in my life, but I cannot realize it according to some reasons. 我希望我很有权势。但由于种种原因，我现在什么都左右不了。
Aspiration 7	Many people have got in the way of my success. 很多人在我成功的道路上设置障碍。
Aspiration 8	My life quality is not as good as it was before. 我现在的生活质量远不如从前。
Aspiration 9	I wish I could change my current living condition, but I cannot. 我很渴望改变目前的生活状态，但却无能为力。

Item No.	Content
Aspiration 10	I wish I could achieve the highest goal in my life, but I cannot. 我渴望实现自我，但却无能为力。
Aspiration 11	I wish I could be successful, but there are too many obstacles in my life. 我渴望成功，但生活中却存在太多的障碍。
Aspiration 12	There are many things I want to do but no time and energy to do. 我想做的事情总是没有条件没有时间去做。
Aspiration 13	I want to make more money, but there is not an opportunity. 我想挣更多的钱，但没有机会。
Aspiration 14	I used to be successful, but now I am a failure. 我曾经很成功，现在很失败。
Aspiration 15	I wish my living environment was clean, but we have now very serious pollution problems. 我希望能有更清新整洁的环境，但污染却很严重。
Aspiration 16	I wish I had fewer burdens in my life, but I have to deal with so many responsibilities every day. 我希望自己的生活各方面能更轻松一点，但却很沉重紧张。
Aspiration 17	I wish I lived in a place with sense of security, but my environment is not safe at all. 我希望生活的环境有良好的治安，但是现在却生活在不安全的环境中。
Aspiration 18	As of now I have not obtained many things really I wanted. 回首往事，有许多想得到的东西没得到。
Aspiration 19	In comparison with others, I am totally a loser. 与其他人比，我感觉自己太失败了。
Aspiration 20	I wish I could be respected by others, but people around me always look down upon me. 我希望得到别人的尊重，但总是被别人看不起。

Note: Items Aspiration 1, 2, 5, 6, and 14 are deleted from the final 15 item aspiration scale.

Deprivation Strain

Item No.	Content
Deprivation 1	Compared to others in my neighborhood (village), I am a poor person. 跟同村或同社区的其他人相比，我是一个穷人。
Deprivation 2	Compared to other families in my community, my family is poor. 跟同村或同社区的其他家庭相比，我家很穷。
Deprivation 3	My life is worse than others. 我比别人生活得差。
Deprivation 4	I am very angry about the society that allows so many people to get rich so easily. 一想到那么多人轻而易举的成了暴发户，轻而易举的获得了大量财富，我就很来气。
Deprivation 5	I hate those rich people.

Item No.	Content
	我恨那些富人。
Deprivation 6	I believe I am good enough, but I am not satisfied with the treatment from others. 我应该是够好的了，但我还是不满意别人对待我的方式。
Deprivation 7	My family does not have the money to support me to go to school. 我家人没有钱供我上学。
Deprivation 8	I am not able to date (marry) the person I love, because my parents don't like him/her. 我不能与我自己喜欢的那位结婚或恋爱，因为我的家人不喜欢。
Deprivation 9	I cannot run for a political office because of the lack of resources. 由于资源不够，我不能竞选我期望的职位。
Deprivation 10	I cannot go to church as much as people around me can, because I am poor. 因为我很穷，所以我不能像其他人那样去教会活动。
Deprivation 11	The world is not as fair to me as it is to others. 这个世界对我不像对其他人那样公平。
Deprivation 12	I have the same qualities as some of my colleagues, but they are paid much more than I am. 我跟别人能力差不多，但是他们的工资要比我的高好多。
Deprivation 13	I always compare myself with those who are better than I am. 我常常跟那些比我过的好的的人相比。
Deprivation 14	I admire others' lives, because they are leading better lives than I am. 我很羡慕别人的生活，觉得别人都比我过的好。
Deprivation 15	People around me are living in better apartments or houses. 周围的大多数人都比我住得好。
Deprivation 16	Most people around me have better and more comfortable working environment. 周围大多数人都比我工作舒适。
Deprivation 17	I work hard and my performance is excellent, but I am not appreciated and promoted as are others who did not do their jobs so good. 我工作很努力很出色，却始终得不到提升；一些无所事事的人却得到重用。
Deprivation 18	My parents, spouse, or children are not as good as others. 我的父母或配偶或子女没有别人家的好。
Deprivation 19	Compared to others, it is more difficult for me to make money. 与别人相比，我认为我挣钱更辛苦。
Deprivation 20	I have worked too much and gained too little. 我认为自己付出了太多，但收获太少。

Note: Items Deprivation 6, 7, 10, 11, and 18 are deleted from the final 15 item deprivation scale.

Coping Strain

Item No.	Content
Coping-1	When I confront a crisis in life, I usually plan steps to successfully solve the problem. 有危机或突发事件时，我总会一步一步地解决事情。
Coping-2	When I encounter a problem at work, I usually consult with my family or friends. 在单位或学校遇到难处时，我常常咨询我的家人或朋友。
Coping-3	Face is so important to me that I will do everything to protect my public image, even suicide. 面子对我来讲太重要了，为了保护面子我能豁出一切，甚至生命。
Coping-4	I cannot handle too many things at the same time. 我没有同时处理很多事情的本事。
Coping-5	To me, death is the solution to all problems that cannot be solved. 我认为死是解决所有无法解决的问题的最好方式。
Coping-6	When confronted with some crisis, my head usually turns blank. 遇到危机时，我的头脑会一片空白，然后会不知所措。
Coping-7	I always do things as I like, without thinking of the consequence. 常常只按自己想的做，且不考虑后果。
Coping-8	Confronting others, I always have to take the upper hand. 如果与人发生争吵，我一定要占上风。
Coping-9	I don't like to ask for the help of others when I have difficulties. 遇到困难的时候，不愿意去寻求他人的帮助。
Coping-10	Everything is determined by fate, and I cannot make any changes. 一切都是上天注定，我无法改变现状。
Coping-11	I cannot forget unpleasant experiences, and the more I think, the worse my feelings are. 我无法忘记不愉快的事，而且会越想越难过。
Coping-12	I believe everything is double sided and I always try to see the positive side of things. 相信事物有两面性，凡事有弊有利，尽量看到事情好的一面，保持乐观的态度。
Coping-13	In difficulty, I often do something else to distract my attention, such as watching TV, reading, listening to music, etc. 面对困境，我会找一些事情做，如看电视、看书、听音乐，即使很无聊的事，至少让自己有事做。
Coping-14	I resort to religion to get help. 面对困难我经常在心里祈祷，希望上天能够帮助我。
Coping-15	Even with small problems, I sometimes feel low and cannot get going. 即使面对一些小问题，也会情绪低落，做什么都打不起精神。
Coping-16	When I have problems, I feel difficult to fall asleep and lose my appetite. 一遇到困难，就会出失眠、胃口不好等情况。

Item No.	Content
Coping 17	In difficulty, I often smoke, drink, take medication, and eat to let myself feel better. 我通过吸烟、喝酒、吃药、吃东西来解除烦恼。
Coping 18	When I have difficulties in what I am doing, I usually give up the task. 遇到困难就会自暴自弃，感觉没有希望。
Coping 19	When I have a problem, I always stay alone and away from others. 遇到困难就会把自己孤立起来，远离众人。
Coping 20	In dealing with things, I often feel out of control and not able to catch up. 我常常会觉得措手不及、手忙脚乱。

Note: Items Coping 1, 2, 12, 13 and 14 are reversely coded and deleted from the final 15 item coping scale.

Table 1

Demographic Characteristics of Study One and Study Two and a Comparison between the Two Samples.

Demographic Variable	Freq. (%)		χ^2	<i>P</i>
	Study One (N=286)	Study Two (N=506)		
Gender				
Male (0)	95 (33.2)	125 (24.7)	6.178	0.013
Female (1)	191 (66.8)	376 (74.3)		
Marital Status				
Single and no relationship (0)	177 (61.9)	363 (71.7)	7.534	0.006
In a relationship but unmarried (1)	102 (35.7)	135 (26.7)		
Religion				
No religion (0)	239 (83.6)	435 (86.0)	3.023	0.082
Have a religion (1)	42 (14.7)	52 (10.3)		
Political Affiliation				
Communist Party member (0)	39 (13.6)	6 (1.2)	52.254	<0.001
Not Communist Party member (1)	247 (86.4)	495 (97.8)		
Health Status				
Bad or average (0)	100 (35.0)	240 (47.4)	11.918	0.001
Good or excellent (1)	186 (65.0)	264 (52.2)		
Education of Father				
No education or less than college (0)	134 (46.9)	443 (87.5)	156.085	<0.001
College or above (1)	152 (53.1)	61 (12.1)		
Education of Mother				
No education or less than college (0)	166 (58.0)	474 (93.7)	160.289	<0.001
College or above (1)	120 (42.0)	27 (5.3)		
Residence				
Rural (0)	66 (23.1)	361 (71.3)	173.168	<0.001
Urban (1)	220 (76.9)	143 (28.3)		
Only Child				
Yes (0)	177 (61.9)	145 (28.7)	83.259	<0.001
No (1)	109 (38.1)	360 (71.1)		

Table 2Factor Loadings of the 20 Items in the **Value** Scale: Rotated Component Matrix

Item No.	Component					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Value 17	.785	.148	.087	-.048	.044	-.063
Value 19	.760	.119	.068	.044	.192	.234
Value 18	.690	.141	.015	.208	.169	.105
Value 7	.090	.802	.016	.043	.125	.102
Value 5	.012	.779	.023	.059	.096	-.024
Value 9	.317	.651	.081	.214	.031	.166
Value 6	.175	.420	.206	.214	.334	-.054
Value 2	.006	.037	.816	.146	.117	.039
Value 1	.222	.029	.784	.181	-.031	-.035
Value 3	-.051	.085	.673	.047	.082	.303
Value 15	.297	-.054	.169	.672	.014	.207
Value 14	.066	.162	.248	.649	-.264	.068
Value 13	-.217	.174	.070	.630	.222	.094
Value 10	.141	.371	.064	.540	.295	-.012
Value 20	.371	-.043	.076	.410	.366	.211
Value 11	.262	.251	.097	.196	.698	-.046
Value 8	.254	.320	.075	-.082	.596	.244
Value 4	.028	.054	.025	.083	.302	.787
Value 12	.203	.054	.222	.223	-.202	.604
Value 16	.249	.241	.334	.201	-.348	.410

Table 3
Factor Loadings of the 20 Items in the **Aspiration** Scale: Rotated Component Matrix

Items No.	Component				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Aspiration 12	.795	.073	-.129	.088	.213
Aspiration 5	.598	.253	.446	.178	-.104
Aspiration 10	.576	.268	.345	.196	.265
Aspiration 3	.570	.238	.228	.115	.112
Aspiration 6	.561	.161	.302	.113	.101
Aspiration 9	.470	.449	.278	.288	.283
Aspiration 13	.339	.762	.145	.154	-.006
Aspiration 14	.275	.751	.087	.016	.130
Aspiration 8	-.042	.640	.354	.261	.273
Aspiration 4	.136	.176	.704	.129	.197
Aspiration 2	.316	.235	.612	.324	.056
Aspiration 11	.515	.097	.579	.186	.294
Aspiration 7	.164	.514	.528	-.109	.056
Aspiration 17	-.003	.076	.209	.809	.200
Aspiration 15	.230	.064	.025	.793	.023
Aspiration 16	.258	.122	.104	.608	.315
Aspiration 1	.214	-.191	.257	.075	.730
Aspiration 19	.056	.262	.192	.162	.670
Aspiration 18	.112	.311	-.287	.145	.632
Aspiration 20	.281	.110	.284	.234	.479

Table 4Factor Loadings of the 20 Items in the **Deprivation** Scale: Rotated Component Matrix

Items No.	Component			
	Factor 1	Factor 2	Factor 3	Factor 4
Deprivation 14	.896	.042	-.212	-.021
Deprivation 20	.851	-.232	.171	.021
Deprivation 4	.823	-.058	.100	.024
Deprivation 17	.789	-.061	-.024	.079
Deprivation 5	.764	.198	-.041	-.211
Deprivation 9	.745	-.275	.285	.128
Deprivation 19	.742	.088	.033	-.146
Deprivation 3	.665	.059	.366	-.122
Deprivation 11	.504	.393	.001	.074
Deprivation 12	.407	.252	-.217	.365
Deprivation 2	-.161	1.022	.145	-.216
Deprivation 1	-.230	.922	.167	.021
Deprivation 16	.196	.681	-.051	.085
Deprivation 18	.326	.596	.104	-.131
Deprivation 15	.327	.558	-.165	.214
Deprivation 10	.133	.477	.203	.216
Deprivation 8	.174	.104	.738	.012
Deprivation 7	-.092	.319	.721	.131
Deprivation 6	-.227	-.064	.220	.918
Deprivation 13	.111	-.082	-.063	.726

Table 5Factor Loadings of the 20 Items in the **Coping** Scale: Rotated Component Matrix

Item No.	Component					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Coping 8	.700	.065	-.116	.133	.117	.099
Coping 10	.678	.142	.213	.084	.037	.051
Coping 7	.520	.223	-.105	.058	.203	.388
Coping 14	-.504	-.012	.005	-.375	-.193	.482
Coping 17	.488	.367	.240	-.063	-.114	-.043
Coping 20	.143	.711	.052	.241	.036	.157
Coping 4	.080	.705	.066	-.106	.019	-.131
Coping 6	.026	.647	.127	.221	.168	.037
Coping 18	.403	.538	.321	.226	.043	.210
Coping 19	.297	.535	.256	.291	-.012	.407
Coping 13	-.015	.176	.741	-.008	.286	.115
Coping 5	.356	.102	.705	.021	-.044	.176
Coping 12	-.190	.218	.599	.281	.330	.023
Coping 15	.103	.204	-.027	.742	-.081	.076
Coping 11	.032	.064	.029	.671	.147	.099
Coping 16	.190	.238	.360	.501	-.162	-.221
Coping 3	.442	-.037	.312	.476	-.088	.049
Coping 1	.141	.122	.100	.011	.859	-.088
Coping 2	.064	.008	.240	-.028	.683	.399
Coping 9	.235	.046	.275	.203	.147	.668

Table 6

Consistency of Items in Each of the Four Scales Respectively of 20 and 15 Items

Strain Scale	Cronbach's α	N of Items	Cronbach's α	N of items
Value	0.844	20	0.800	15
Aspiration	0.907	20	0.885	15
Deprivation	0.947	20	0.901	15
Coping	0.817	20	0.865	15
Total	0.971	80	0.944	60

Table 7

Factor Loadings of the 15 Items in the **Value** Scale: Rotated Component Matrix

Items No.	Component				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor5
Value 9	.728	.150	.098	.194	.116
Value 10	.723	.060	.252	.179	.051
Value 8	.690	-.055	.234	.150	-.006
Value 3	-.049	.757	.215	.046	.008
Value 2	.019	.726	-.013	.144	.270
Value 1	.340	.638	-.023	.044	.240
Value 5	.106	.247	.717	.093	-.068
Value 6	.162	-.047	.688	-.011	.190
Value 7	.289	.041	.684	.181	.050
Value 19	.162	.130	.057	.776	.106
Value 20	.090	.093	.315	.697	.132
Value 17	.327	.021	-.054	.646	.076
Value 12	.167	.040	.013	-.021	.771
Value 16	.028	.201	.080	.262	.720
Value 14	-.074	.387	.134	.150	.605

Table 8Factor Loadings of the 15 Items in the **Aspiration** Scale: Rotated Component Matrix

Items No.	Component			
	Factor 1	Factor 2	Factor 3	Factor 4
Aspiration 10	.730	.162	.196	.239
Aspiration 3	.704	.094	-.122	.386
Aspiration 4	.645	.125	.056	.346
Aspiration 9	.607	.179	.373	.218
Aspiration 13	.592	.220	.258	.031
Aspiration 12	.587	.287	.405	-.193
Aspiration 11	.538	.350	.372	.034
Aspiration 15	.221	.779	-.042	.004
Aspiration 17	.044	.745	.157	.242
Aspiration 16	.199	.705	.218	.026
Aspiration 18	.317	.555	.061	.350
Aspiration 7	.116	.198	.714	.212
Aspiration 8	.231	.001	.687	.216
Aspiration 20	.159	.112	.359	.740
Aspiration 19	.330	.213	.194	.701

Table 9Factor Loadings of the 15 Items in the **Deprivation** Scale: Rotated Component Matrix

Items No.	Component			
	Factor 1	Factor 2	Factor 3	Factor 4
Deprivation 14	.740	.146	.324	-.033
Deprivation 16	.734	.259	.224	.155
Deprivation 15	.723	.339	.142	.046
Deprivation 17	.722	.090	.020	.269
Deprivation 20	.684	.174	.038	.239
Deprivation 13	.657	-.024	.250	.034
Deprivation 19	.635	.229	.129	.292
Deprivation 12	.629	.139	.179	.317
Deprivation 2	.189	.896	.055	.062
Deprivation 1	.135	.887	.092	.056
Deprivation 3	.266	.691	.249	.220
Deprivation 5	.226	.125	.849	.149
Deprivation 4	.261	.176	.800	.170
Deprivation 8	.119	.092	.221	.824
Deprivation 9	.377	.132	.066	.689

Table 10Factor Loadings of the 15 Items in the **Coping** Scale: Rotated Component Matrix

Items No.	Component			
	Factor 1	Factor 2	Factor 3	Factor 4
Coping 18	.805	.242	.219	.111
Coping 17	.740	.181	.162	-.010
Coping 5	.720	.039	.156	.237
Coping 19	.489	.362	.406	.007
Coping 15	.094	.809	.083	.146
Coping 16	.184	.806	.073	.082
Coping 11	.099	.590	.381	.090
Coping 20	.361	.528	.185	.389
Coping 9	.108	.167	.734	.016
Coping 8	.117	.165	.733	.126
Coping 3	.285	.086	.570	.059
Coping 10	.437	.113	.474	.281
Coping 7	.329	-.028	.429	.360
Coping 4	.066	.107	.070	.787
Coping 6	.120	.202	.104	.787

Table 11

Correlations of Each Strain Scale (Total Score of 15 Items) with Its Corresponding Criterion Scale/Variable

Strain Name	Corresponding Criterion Scale/Variable	Spearman's Correlation Coefficients	<i>P</i>
Value Strain	Culture Value Scale	0.3125	<0.001
Aspiration Strain	Wish Realized or Not	0.174	<0.001
Deprivation Strain	Family Social Economic Status	0.227	<0.001
Coping Strain	CRI Coping Scale	−0.278	<0.001

Table 12
Univariate Analyses of the Psychopathology by Each of the Strains and Relevant Demographic Variables (N=506)

Variable	Variable coded	Spielberger-Trait Anxiety		CES-D Depression		Kessler NCS Suicidal Ideation	
		r / t	p	r / t	p	t / χ^2	p
Value Strain	Total score of scale	0.382	<0.001	0.354	<0.001	-3.547	<0.001
Aspiration Strain	Total score of scale	0.479	<0.001	0.397	<0.001	-3.684	<0.001
Deprivation Strain	Total score of scale	0.435	<0.001	0.408	<0.001	-4.260	<0.001
Coping Strain	Total score of scale	0.460	<0.001	0.498	<0.001	-4.747	<0.001
Gender	Male = 0 Female = 1	2.030	0.043	4.831	<0.001	0.505	0.477
Marital Status	Single and no relationship = 0 In a relationship but unmarried = 1	-1.791	0.074	-0.975	0.330	7.046	0.030
Religion	No religion = 0 Have a religion = 1	-1.416	0.158	-1.840	0.066	0.992	0.609
Political Affiliation	Communist Party member = 0 Not Communist Party member = 1	0.451	0.652	1.713	0.087	2.973	0.226
Health Status	Bad or average = 0 Good or excellent = 1	2.869	0.004	3.131	0.002	2.421	0.120
Father Education level	No education or less than college = 0 College or above = 1	1.692	0.091	0.089	0.929	1.111	0.292
Mother Education level	No education or less than college = 0 College or above = 1	0.907	0.365	0.656	0.512	0.032	0.857
Residence	Rural = 0 Urban = 1	2.087	0.037	0.476	0.634	4.835	0.028
Only Child	Yes = 0 No = 1	-1.258	0.209	-0.255	0.799	6.659	0.010

Table 13
Predicting Psychopathology by the Psychological Strains with Social Demographic Factors as Covariates (N=506)

Variable	Spielberger-State Anxiety			CES-D Depression			Kessler NCS Suicidal Ideation		
	β	t	p	β	t	p	β	OR	p
Psychological Strains	0.503	12.816	<0.001	0.457	11.637	<0.001	0.022	1.023	<0.001
Gender (Being female)	-0.068	-1.758	0.079	-0.189	-4.891	<0.001			
Marital Status (In a relationship but unmarried)	0.056	1.441	0.150				0.511	1.668	0.045
Religion (Yes)				0.063	1.622	0.106			
Political affiliation (Not a Party member)				-0.007	-0.177	0.860			
Health Status (Good or excellent)	-0.028	-0.705	0.481	-0.045	-1.156	0.248	-0.245	0.783	0.438
Education Father (College or above)	-0.025	-0.584	0.559						
Residence (Urban)	-0.052	-1.212	0.226				-0.744	0.475	0.109
Only Child (No)							0.630	1.877	0.169
R ²	0.280			0.273			0.069		

Note: The β in the three models is all standardized β