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Interpersonal Problems and Acculturative Stress Over Time Among Chinese International Students From Mainland China and Taiwan

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Chinese international students (CISs) are the biggest international student group in the United States. Among the challenges CISs face, the current study focused on examining the role of interpersonal problems on their acculturative stress. The Inventory of Interpersonal Problems–Short Circumplex (IIP-SC) was used to measure CISs' interpersonal problems. An evaluation of psychometric properties of IIP-SC among CISs was conducted. Comparison of IIP-SC scores before and during their studies indicated a decreased investment in the communion domain of interpersonal problems. This decrease could be due to less need to be nurturant and gaps in cultural norms between contexts in China and the United States. CISs' agency and general elevation of interpersonal problems at prearrival were found to be predictive of their acculturative stress after a semester of studying in United States, while controlling their gender, age, and general psychological distress. Lower prearrival agency and higher general interpersonal distress were associated with higher acculturative stress. The findings of the current study are important in identifying potential factors (i.e., low agency in interpersonal relationships) that contributed to CISs' acculturative stress. This can inform international student services, staff, faculty, and mental health professionals how to bridge this gap and facilitate CISs' acculturative processes.

What is the public significance of this article?
This study suggests that problematic interpersonal styles of Chinese international students are associated with their acculturative stress as they begin studying in the United States and acculturate to the U.S. culture. More specifically, less assertive students may experience greater stress. Although this is not a definite, causal relationship, the finding suggests a need of more proactive outreach to less assertive Chinese international students by providing appropriate sociopsychological services.

Keywords: Chinese international students, interpersonal problems, acculturative stress, Inventory of Interpersonal Problems–Short Circumplex

International students (ISs) in the United States are a unique group with diverse cultural backgrounds, yet similar struggles. They have also been a fast-growing population over the past decade, increasing by >80% from the school year of 2005/2006 to 2015/2016. In 2015/2016, more than a million ISs were enrolled in colleges and universities alone (Institute of International Education, 2016a). With large numbers enrolled in higher education, they have been described as a major contribution to the United States in various ways. For example, evidence suggests that ISs in graduate schools have a significant impact on U.S. innovation, as shown in the positive prediction of increased future patents and patent applications awarded to university and nonuniversity institutions by ISs (Chellaraj, Maskus, & Mattoo, 2008). It is also estimated that ISs directly contributed $35.8 billion to the U.S. economy in the year of 2014/2015 (Institute of International Education, 2016b).

However, despite their success, ISs frequently encounter challenges in a variety of areas, due to both tangible and intangible losses (Lee, Koeske, & Sales, 2004; Wei, Ku, Russell, Mallinckrodt, & Liao, 2008; Zhang & Goodson, 2011). Tangible losses include the loss of in-person access to a social support system such as family and friends as well as the loss of financial stability, whereas intangible losses include decreases in cultural self-efficacy, sense of belonging, and relevancy of knowledge (Wang, Wei, Zhao, Chuang, & Li, 2015). All of these challenges could lead to general acculturative stress, perceived prejudice, and specific psychological symptoms (Berry, 1997; Constantine, Kindaichi, Okazaki, Gainor, & Baden, 2005). Although most ISs encounter similar challenges due to cross-cultural transitions, they are not all the same. Increasing studies have emphasized the heterogeneity among ISs, with students from Asia, Africa, and South America experiencing greater distress and perceived discrimination compared with their European and North American counterparts (Fritz,

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Chin, & DeMarinis, 2008; Poyrazli, Kavanaugh, Baker, & Al-Timimi, 2004).

Chinese International Students

Among the diverse groups of ISs, those with a Chinese cultural heritage are the largest and tend to experience relatively more challenges. Chinese ISs accounted for 34.3% of the total IS population during the year of 2015/2016, amounting to >350,000 students when combining ISs from Mainland China, Taiwan, and Hong Kong (Institute of International Education, 2016a). Although there are historic and political differences between Mainland China and Taiwan, ISs from both places share much in common such as the same spoken language (Mandarin), the same cultural–philosophical roots in Confucianism, Daoism, and Buddhism, and similar social rituals and scripts. Researchers have frequently studied the two groups together because of their similarities (Liu, Munakata, & Onuoha, 2005). In the current study, the term Chinese international students (CISs) refers to those from both Mainland China and Taiwan.

CISs studying in the United States face greater cultural differences compared with students from European countries, and thus are prone to more stress and distress (Lin & Betz, 2009; Wei, Wang, Heppner, & Du, 2012). For example, Chinese-speaking students have a relatively lower mean TOEFL iBT scores (78 out of 120) compared with those from many European countries as well as Asian countries such as India, for which English is an official language (Educational Testing Service, 2016). This difference, although not definitive, illustrates the potentially greater language barriers that CISs encounter compared with other ISs. Numerous studies have suggested that better language (English in this case) proficiency is a significant predictor of less acculturative stress (Poyrazli et al., 2004), higher social self-efficacy (Lin & Betz, 2009), and fewer depressive feelings (Yeh & Inose, 2003). Given the challenges such as language barriers that CISs commonly face, it is important for mental health practitioners to further understand the psychological struggles of this population (Li et al., 2017).

Acculturative Stress

For CISs, and ISs in general, acculturative stress is a common experience as they transition and acculturate from their original culture to the host culture. Berry (1997) conceptualized acculturative stress, in comparison with the medical notion of stress as "reactions to conditions of living," as reactions to challenges or problems (stressors) that occur specifically during the acculturative process. He further developed a comprehensive model of the acculturative process with variables at both group and individual levels as well as moderating factors, such as coping strategies and the length of time in the United States. Some other common factors Berry (1997) identified include age, gender, and concurrent overall psychological distress.

For CISs, several variables may be particularly salient to their acculturative process compared with their European counterparts. For example, language barrier was noted earlier, given that higher English proficiency is predictive of less acculturative stress (Poyrazli et al., 2004). Moreover, CISs' cultural distance (i.e., a gap between two cultural groups) to the United States is larger than many other groups of ISs, such as European students or South American students (Wang & Mallinckrodt, 2006). Based on Hofstede, Hofstede, and Minkov's (2010) cultural dimensions theory, there are significant differences on several value dimensions between China and the United States, such as collectivism/individualism, power distance, and long-/short-term orientation. Cultural distance has been identified as a factor affecting ISs' cultural transition in the United States (Berry, 1997).

Another significant factor related to CISs' acculturative process is interpersonal relationship quality, part of an individual's personality tendencies that influences the acculturative process, as suggested by Berry (1997). However, few, if any, studies have been conducted to examine the association between CISs' interpersonal problems and acculturative stress.

Interpersonal Problems

The construct of interpersonal problems (Horowitz, 1996) is a set of personality characteristics addressing problematic tendencies of an individual's interpersonal relationship. In Mallinckrodt's (2000) social competencies in the interpersonal process model, he argued that interpersonal problems can be seen as deficits in one's social competencies, which in turn can directly impact one's available social support. Moreover, personality dispositions such as interpersonal problems can indirectly lead to psychological distress through their negative effects on relationship quality.

In particular, because of the complex relational network that Chinese societies and contexts often require (Gabrenya & Hwang, 1996), interpersonal relationships and problems may play an even more important role in CISs' acculturation. Transitioning from the collectivistic environment of China to the individualistic society of the United States can be challenging for CISs, due to the differences in social norms and interpersonal dynamics. For example, in a study on acculturation and interpersonal problems, Ryder, Alden, Paulhus, and Dere (2013) reported that Chinese Canadians encounter greater difficulties with interpersonal adjustment when interacting with European counterparts than with fellow Chinese Canadians. Similarly, Asian ISs' cross-cultural contact with Americans is positively related to their sociocultural adjustment (Li & Gasser, 2005). In fact, such cultural differences can also be manifested by the differed profiles of interpersonal problems across countries (Hopwood, Pincus, DeMoor, & Koonce, 2008; Salazar, Martí, Soriano, Beltran, & Adam, 2010; Vanheule, Desmet, & Rosseel, 2006; Wu, Roche, Dowgwillo, Wang, & Pincus, 2015). It is reasonable to believe that the specific types and tendencies of CISs' interpersonal problems, heavily impacted by their Chinese cultural traditions, may uniquely impact their acculturation process and stress therein.

Another factor that makes it important to study interpersonal problems among CISs comes from a sociopolitical perspective. Most mainland Chinese students in the past 2 decades have been raised in a single-child family due to China's one-child policy. In terms of the psychological outcomes of single children after almost 30 years of implementing this policy, results are mixed (Falbo, 2012). Some have reported that students from single-child families were found to have more psychological and interpersonal problems (Liu et al., 2005), whereas other studies have also indicated equal, if not better, academic achievements among the single children than their counterparts with siblings (Poston & Falbo,

1990). Although it is inconclusive whether the single-child status poses advantages or disadvantages to the younger generations of Chinese, it is still important to examine whether CISs, who are mostly without siblings, may experience unique interpersonal problems and acculturative stress.

With these factors combined, we seek to explore how interpersonal problems can impact CISs' acculturative process in the United States. Currently, few, if any, studies have examined the role of interpersonal problems in predicting acculturative stress. The unique single-child policy, cultural distance on the collectivism–individualism dimension between cultures in China and United States, and acculturative challenges that CISs experience are important reasons that a better understanding of the relationship between CISs' interpersonal problems and their acculturative stress is warranted.

To examine interpersonal problems, we used the Inventory of Interpersonal Problems–Short Circumplex (IIP-SC). The IIP-SC is the short form of the widely used Inventory of Interpersonal Problems developed by Horowitz, Rosenberg, Baer, Ureño, and Villaseñor (1988). IIP-SC was first validated with a mental health inpatient population (Soldz, Budman, Demby, & Merry, 1995), and later with college students (Hopwood et al., 2008). The scale has also been translated and validated in several different languages: Dutch (Vanheule et al., 2006), Spanish (Salazar et al., 2010), and Chinese (Wu et al., 2015). In terms of structure, IIP-SC can be understood as having a general Distress factor (Tracey, Rounds, & Gurtman, 1996), which is associated with two dimensional factors. The two dimensional factors, Agency (or Dominance) and Communion (or Love) are two axes accounting for the circumplex structure of eight subscales of the measure, namely, the Domineering, Vindictive, Cold, Avoidant, Nonassertive, Exploitable, Overly Nurturant, and Intrusive interpersonal problems. The constructs of Agency and Communion have been historically argued to be two superordinate dimensions of personality traits (Wiggins, 2003; Pincus & Gurtman, 2006). Agency generally refers to being a differentiated individual, and ranges from being too controlling (high in agency) to being too nonassertive (low in agency) in interpersonal problems. Communion refers to being part of a larger social or spiritual entity, and ranges from being overly other-oriented (high in communion) to lacking care of others (low in communion) in interpersonal problems. Other subscales represent blends of interpersonal problems in agency and communion (Slaney, Pincus, Uliaszek, & Wang, 2006).

The Current Study

The aims of this study are threefold: (a) to evaluate the psychometric properties of the IIP-SC among CISs, (b) to compare IIP-SC scores before and after cross-cultural transition, and (c) to examine the predictability of prearrival interpersonal problems on acculturative stress. Some questions may rise around the choice of IIP-SC as a measure to evaluate the interpersonal problems of CISs. Although Wu and colleagues (2015) has established the reliability and validity of the IIP-SC among a Chinese college population, further replication of the structural validity in cross-cultural settings would be important. Therefore, the first aim of this study is to evaluate the IIP-SC's structure.

During the cross-cultural transition process of CISs, the types of interpersonal problems that are encountered may change due to the shift of cultural contexts with different interpersonal norms. Based on our knowledge, no study has examined natural changes in interpersonal problems, but there is reason to suspect changes in CISs' interpersonal problems during cross-cultural transition. The cross-cultural transition and acculturation process are featured with both tangible and intangible losses (Wang et al., 2015), and may impact CISs' interpersonal styles and problems. Therefore, the second aim of this study is to compare IIP-SC scores to identify differences across two points in time: prearrival and during the second semester of studying in universities in the United States.

Moreover, it would be informative for counselors and researchers to understand how preexisting interpersonal problems can predict later acculturative stress for CISs. Through a qualitative study, CISs reportedly found it drastically different that Americans tend to be more interpersonally direct and straightforward (Li et al., 2017). The accustomed, indirect manner of Chinese culture made it difficult for CISs to seek and receive help in the United States. Types of interpersonal problems may interplay with different social norms between two cultures and, in turn, affect acculturation. Given that the U.S. culture emphasizes more on independence, individualism, and more direct communication styles compared with China, we logically suspect that types of preexisting interpersonal problems characterizing lower agency and higher communion investment may negatively influence CISs' acculturation process, associating with higher acculturative stress. Thus, the third aim of our study is to the examine whether CISs' acculturative stress in the United States can be predicted by the levels and types of prearrival interpersonal problems. Variables such as age, gender, and overall psychological distress should be controlled when examining these associations, given their contributions to acculturative stress.

In sum, this study attempts to bridge several gaps in the knowledge base of CISs' interpersonal problems and acculturative stress. In addition to the validity replication, the following hypotheses were made: (a) CISs' interpersonal agency would increase after studying in the United States because of the stronger emphasis on independence and proactivity in U.S. culture; meanwhile, their level of communion would decrease after the cross-cultural transition due to the increased losses and difficulty accessing social support; (b) given aforementioned evidence of convergent validity of the general IIP-SC interpersonal distress with psychological distress, we hypothesize that CISs' prearrival general interpersonal distress would be predictive of higher acculturative stress, when controlling for age, gender, and overall psychological distress; finally, (c) for CISs, lower agency and higher communion at prearrival would be predictive of higher acculturative stress, when controlling for age, gender, and overall psychological distress.

Method

Participants

The sample in this study was a subsample of participants who participated at pre- and postarrival timepoints of studying in the United States from a larger study (Wang et al., 2012). The current sample consists of 243 CISs with Time 1 data and 177 of them also with Time 2 data. Time 1 in this study occurred before the participants started their new program of study, whereas Time 2 occurred during their second semester of their new program of

study. There were 101 men and 142 women with a mean age of 24.3 years old ($SD = 3.30$) at Time 1. A total of 137 respondents were from Taiwan and 106 from Mainland China. Most of the participants were pursuing a Master's (53.5%) or doctorate (30.5%) degree, and were studying in various states of the United States, including Missouri (14.4%), California (11.9%), New York (11.9%), and Pennsylvania (9.9%), among others. The majority (79.8%) of them reported this being their first time studying in United States, and many (52.7%) of them had been in the United States before.

Measures

Acculturative Stress Scale for International Students. There are 36 items measuring the ISs' acculturative stress in the Acculturative Stress Scale for International Students, and they were grouped into seven subscales: Perceived Discrimination (eight items), Homesickness (four items), Perceived Hate (five items), Fear (four items), Stress Due to Change/Culture Shock (three items), Guilt (two items), and Nonspecific Concerns (10 items; Sandhu & Asrabadi, 1994). Items were rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The current study uses the composite score, with higher scores suggesting greater acculturative stress. The Chinese version of the Acculturative Stress Scale for International Students was translated by Wei and colleagues (2007) based on Brislin's (1980) three-step back-translation guidelines. The αs for the composite score has ranged from .92 to .94 among CISs (Wei et al., 2007; Wei, Liao, Heppner, Chao, & Ku, 2012). The construct validity has been supported by positive associations with depression and negative associations with adjustment among CISs (Wei et al., 2007; Wei, Liao, et al., 2012).

The Brief Symptom Inventory-18. The Brief Symptom Inventory-18 (BSI-18) is an 18-item measure of overall psychological distress (Derogatis, 2001), with the items on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*always*). There are three subscales in the BSI-18: Depression, Anxiety, and Somatization. The current study used the composite score, with higher scores suggesting more intense psychological distress. The Chinese version of the BSI was translated based on Brislin's (1980) three-step back-translation, with one item modified. Due to concerns about participant perceptions and institutional review board complications, the original item "Thoughts of ending your life" was modified to "Pessimistic thoughts of life." The α of the BSI-18 for a sample of CISs was .88, and the construct validity was demonstrated by strong positive associations with psychological distress measured by other tools and adjustment difficulties among CISs (Wang & Mallinckrodt, 2006).

The Inventory of Interpersonal Problems–Short Circumplex. The IIP-SC is a 32-item short form of the widely used Inventory of Interpersonal Problems Circumplex Scales (Alden, Wiggins, & Pincus, 1990; Hopwood et al., 2008; Soldz et al., 1995). The IIP-SC measures interpersonal difficulties characterized by clients entering psychotherapy, and exhibits the circumplex structure that corresponds to "the interpersonal aspects of personality disorders" (Soldz et al., 1995, p. 54). The IIP-SC has four items for each of its eight subscales: Domineering, Vindictive, Cold, Socially Avoidant, Nonassertive, Exploitable, Overly Nurturant, and Intrusive. Sample items for each subscale include "I argue with other people too much" (Domineering), "I am too suspicious of other people" (Vindictive), "It is hard for me to feel close to other people" (Cold), "It is hard for me to join in on groups" (Socially Avoidant), "It is hard for me to be firm when I need to be" (Nonassertive), "I am too easily persuaded by other people" (Exploitable), "I try to please other people too much" (Overly Nurturant), and "I open up to people too much" (Intrusive). The inventory uses a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*), with higher scores suggesting greater distress in social relationships. The eight octants of interpersonal problems are presumed to align around the circumference of a circle with two perpendicular axes of Agency (Dominance, DOM) and Communion (Love, LOV). The values of DOM and LOV are calculated with the *z* values of each octants based on its angular alignment on the axes. The elevation in IIP-SC is the average correlation across subscales (or octants), and a standardized score suggesting the degree of general interpersonal distress in the responses on the measure. The Chinese version of the IIP-SC was an adaption of the translation by Wang and Scalise (2010) to enhance the accuracy of a few items, and is slightly different from the version translated by Wu and colleagues (2015). The αs of the eight scales in a sample of Taiwanese adults ranged from .61 (Exploitable) to .74 (Socially Avoidant). However, it is also noteworthy that the structural validity of this particular Chinese version of the IIP-SC had not been previously examined, which necessitates further examination if it is to be used among the Chinese-speaking population (Wang & Scalise, 2010). Construct validity of the IIP-SC was supported through its association with attachment anxiety and avoidance (Wang & Scalise, 2010).

Procedure

The project was reviewed and approved by the Campus institutional review board of the University of Missouri–Columbia under the title of *Cross-Cultural Transition of International Students* (IRB number: 1165980). The participants were recruited online from different sources such as international student service offices of universities and study abroad agencies. Inclusion criteria are being at least 18 years old and an incoming student for an undergraduate/graduate program in a U.S. college or university. The participants completed online surveys at different timepoints, and data of the two timepoints were used for the current study. Each participant was asked a number of demographic questions (e.g., gender, highest TOEFL score, birthday) used for linking across different timepoints. Time 1 is the *prearrival* stage, which was before the start of their program, although some students may have already arrived at the United States at the point of completing the survey. Time 2 in the current study was at the beginning of their second semester.

Results

Preliminary Analyses

To assess attrition effects, we conducted preliminary analyses on gender, age, and IIP-SC subscales, axes, and elevation scores at Time 1, which are variables used in subsequent repeated measure analysis of variance and hierarchical regressions. Chi-square test for categorical variables (gender) and *t* tests for continuous vari-

ables (age, IIP-SC) were conducted between (a) participants who only completed Time 1 survey and (b) those who completed both Time 1 and 2 surveys. All *t* tests and the chi-square test revealed no significant differences (*Fs* ranged from 0.02 to 2.83, *p*s $>$ .09; Pearson chi-square = 0.57, $p = .45$). Thus, missing completely at random was assumed (Enders, 2010). Analyses involving Time 2 data were ran with participants who completed the surveys at both timepoints.

Reliability

The Cronbach's αs for the IIP-SC in this CIS sample are overall adequate, with all subscales at both timepoints above .70, with the exception of BC-Vindictive (.60) at Time 1 and PA-Domineering (.64) at Time 2. The internal consistencies of the IIP-SC in this sample are overall consistent with or in some cases slightly better than those from previous studies. The internal consistencies of some subscales are less than ideal (<.70), but it is noteworthy that all these subscales are only four-item scales, which would have influenced the reliability coefficient.

Variable Correlations and Structural Validity

The intercorrelations between the IIP-SC subscales across the two timepoints are presented in Table 1, with the upper right half of the table for Time 1 and the bottom left half for Time 2. The correlations between IIP-SC subscales score were mostly moderate, between .40–.59. For Time 1, the correlations of subscales ranged from .20 to .75. For Time 2, the subscale correlations ranged from .31 to .76.

Correlations between major outcome variables including the IIP-SC elevation, agency, and communion scores at both timepoints, BSI score at Time 2, and acculturative stress at Time 2 are presented in Table 2. Scores on IIP-SC agency, communion, and elevation over time were highly correlated (*p*s $<$ .001). Elevations on IIP-SC at both timepoints also positively correlated with general acculturative stress and general psychological distress at Time 2 (*p*s $<$ .001). Moreover, participants' agency at Time 1 was found to negatively correlate with elevation on IIP-SC at Time 1 ($p <$ .05) and Time 2 ($p <$ .01) as well as with acculturative stress at Time 2 ($p <$ .001), but not with general psychological distress at Time 2 ($p = .31$). Students' communion level was not correlated with distress-related variables.

To examine the circular structure of the IIP–SC scales, we used a randomization test of hypothesized order relations (Hubert & Arabie, 1987) via the RANDALL program (Tracey, 1997) to compute the number of predictions met in the sample based on an eight-octant circumplex. RANDALL is a confirmatory approach for circular structures, and correspondence index (CI; Hubert & Arabie, 1987) has been commonly used to interpret RANDALL results. The CI is calculated by the number of predictions met minus those violated, divided by the total number of predictions. CI values range from −1.0 to 1.0, with 0 indicating 50% of the predictions met. As for the IIP-SC eight-octant circumplex with an 8×8 correlation matrix, a total of 288 pairs of correlations are used to test hypothesized order predictions. RANDALL analyses for Time 1 resulted in a CI of .71 ($p <$ .001), indicating 246 of the 288 predictions (85%) were met. RANDALL analyses for Time 2 resulted in a CI of .62 ($p <$ .001), indicating 233 of the 288 predictions (81%) were met. We followed the RANDALL results with analyses using a confirmatory circumplex analytic program—CIRCUM (Browne, 1992) to evaluate circular structure with increasingly strict levels of model fit. CIRCUM (see Table 3) analyses for Time 1 indicated adequate fit for Model 2, requiring equal radii but allowing for unequal angular spacing. However, CIRCUM analyses for Time 2 failed to indicate adequate fit for any of the models, but it is noteworthy that CIRCUM is a stringent test.

Table 1
Means, Standard Deviations, and Correlations Among Inventory of Interpersonal Problems–Short Circumplex Octants Scores Over Two Timepoints

Variables	PA	BC	DE	FG	HI	JK	LM	NO	*M*	*SD*
PA	—	.59	.44	.36	.28	.30	.44	.56	2.30	2.43
BC	.69	—	.60	.51	.43	.41	.49	.45	2.04	2.18
DE	.52	.59	—	.57	.36	.36	.38	.20	3.00	2.79
FG	.42	.42	.61	—	.48	.44	.45	.28	3.37	2.90
HI	.35	.46	.40	.42	—	.75	.60	.47	4.24	3.05
JK	.45	.53	.46	.43	.75	—	.68	.55	4.04	2.98
LM	.51	.54	.43	.35	.58	.76	—	.48	3.43	2.86
NO	.61	.64	.39	.31	.41	.62	.60	—	3.16	2.86
M	2.01	2.03	3.22	4.10	4.43	3.82	2.85	3.06		
SD	2.08	2.32	2.78	2.96	3.01	3.11	2.69	2.75		

Note. Time 1 $N = 243$, Time 2 $N = 177$; PA = Domineering; BC = Vindictive; DE = Cold; FG = Avoidant; HI = Nonassertive; JK = Exploitable; LM = Overly Nurturant; NO = Intrusive. The upper right half of table are the correlations for Time 1, and the bottom left half for Time 2. Time 1 means and standard deviations are presented in the last two columns, whereas Time 2 means and standard deviations are presented in the last two rows. All correlations are significant at the .01 level (two tailed).

Change of IIP-SC Over Time

Given the lack of structural validity in the responses of IIP-SC of Time 2, comparisons of the eight octants of IIP-SC between the two timepoints were not conducted. We simply examined whether the two axes of the IIP-SC changed during the cross-national transition process, using repeated measures analysis of variance. A significant difference was found on the axis of communion over time [Sphericity assumed: $F(1, 176) = 22.70$, $p <$ .001]. The mean at Time 1 of −.22 (*SD* = 0.45) decreased to −.36 (*SD* = 0.44) at Time 2, indicating increased distress related to disaffiliative social behaviors. No significant differences but a trend was found for the axis of agency, decreasing from −.13 at Time 1 to −.19 at Time 2 [Sphericity assumed: $F(1, 176) = 3.05$, $p = .082$], nor was a significant difference found for IIP-SC elevation, or the general distress, between Time 1 and 2 ($p = .80$).

Regression

Similar to the analyses on the change of IIP-SC over time, we did not conduct regression analysis with the subscale scores either. Instead, we examined which prearrival IIP-SC axes predicted later levels of acculturative stress for CISs after controlling for the effects of age, gender, and psychological symptoms. A hierarchical multiple regression analysis was conducted to predict the acculturative stress from the following factors: Age, Gender, Psychological Symptoms, the Prearrival Axes scores, and their interaction

Table 2
Correlations Among Major Outcome Variables

Variables	DOM1	LOV1	ELEV1	DOM2	LOV2	ELEV2	AS-T2	BSI-T2
DOM1	—							
LOV1	−.11	—						
ELEV1	−.16*	.09	—					
DOM2	.46***	−.12	−.10	—				
LOV2	−.07	.61***	.08	−.06	—			
ELEV2	−.22*	.02	.70***	−.16*	.07	—		
AS-T2	−.25*	.02	.36***	−.20*	.01	.51***	—	
BSI-T2	−.08	.09	.32***	.02	.07	.41***	.36***	—

Note. Time 1 $N = 243$, Time 2 $N = 177$; DOM1 = agency at Time 1; LOV1 = communion at Time 1; ELEV1 = elevation at Time 1; DOM2 = agency at Time 2; LOV2 = communion at Time 2; ELEV2 = elevation at Time 2; AS-T2 = acculturative stress at Time 2; BSI = Brief Symptom Inventory; BSI-T2 = BSI scores, or general psychological distress, at Time 2.
* $p < .05$. *** $p < .001$.

(DOM × LOV). The B, SE_B, and β for each predictor at each step of the equation are presented in Table 4. At Step 1, gender and age were entered simultaneously into the model. Neither variable significantly predicted the level of acculturative stress, $R^2 = .002$, $F(2, 139) = 0.17$, $p = .85$. At Step 2, Time 2 psychological symptom score of BSI was entered, resulting in a significant R^2 increase, $\Delta R^2 = .11$, $\Delta F(1, 138) = 17.20$, $p < .001$. The overall model R^2 at Step 2 was also significantly different from zero, $R^2 = .11$, $F(3, 141) = 5.86$, $p < .001$. At Step 3, the axes of the IIP-SC were entered. In this step, there was also a significant R^2 change, $\Delta R^2 = .05$, $\Delta F(2, 136) = 3.85$, $p < .05$. The overall model R^2 was significant after Step 3, $R^2 = .16$, $F(5, 136) = 5.20$, $p < .001$. The axis of agency, specifically low agency or nonassertiveness significantly predicted later acculturative stress ($\beta = -.23$, $p < .01$). At Step 4, the interaction term of the two IIP-SC axes was entered. However, adding the interaction of the two axes did not result in significant R^2 change, $\Delta R^2 = .001$, $\Delta F(1, 135) = 0.10$, $p = .75$.

A similar hierarchical regression was conducted by substituting the IIP-SC axes with the elevation of the IIP-SC. The results are presented in Table 5. The first two steps were identical to the previous regression analysis, but on the final step, the elevation of the IIP-SC was entered. It also resulted in significant R^2 change, $\Delta R^2 = .09$, $\Delta F(1, 137) = 14.82$, $p < .001$. General interpersonal distress significantly predicted later acculturative stress ($\beta = -.31$, $p < .001$). The overall model R^2 was also significant after Step 3, $R^2 = .20$, $F(4, 137) = 8.54$, $p < .001$.

Discussion

This is the first study to examine the role of interpersonal problems in the cross-cultural transition process of ISs using data that included timepoints before and after starting their studies in the United States. The aims of this study were to (a) replicate the structural validity of the IIP-SC among a CIS sample, (b) examine the longitudinal change of CISs' interpersonal problems before and after a cross-cultural transition, and (c) explore how interpersonal problems are associated with acculturative stress for CISs.

Structural Validity Replication

The replication of the structural validity converged with results from a previous study that suggested the IIP-SC to be an overall promising measure to use with Chinese-speaking students (Wu et al., 2015), even when extended to a cross-cultural setting. The internal consistency of the Chinese version of IIP-SC ranged from .60 to .79, within acceptable range. The reliability coefficients of this Chinese version are comparable with those among a Dutch sample (Cronbach's αs ranging from .64 to .75; Vanheule et al., 2006) and a Spanish sample (Cronbach's αs ranging from .41 to .84; Salazar et al., 2010), but are overall lower than those among a U.S. college student sample (Cronbach's αs ranging from .66 to .83; Hopwood et al., 2008). The internal consistency indices were also comparable with another Mandarin-Chinese version of the IIP-SC (Cronbach's αs ranging from .53 to .76; Wu et al., 2015).

Table 3
CIRCUM Results for Inventory of Interpersonal Problems–Short Circumplex at Time 1 and Time 2

			Time 1			Time 2		
Model	Radius	Spacing	*df*	RMSEA	RMSEA 90% CI	*df*	RMSEA	RMSEA 90% CI
Model 1	Equal	Equal	12	.121	[.099, .145]	12	.131	[.108, .154]
Model 2	Equal	Unequal	19	.065	[.032, .096]	19	.092	[.064, .121]
Model 3	Unequal	Equal	19	.124	[.098, .152]	19	.101	[.073, .130]
Model 4[a]	Unequal	Unequal	26	.069	[.028, .110]	26	.056	[0, .098]

Note. RMSEA = root mean square error of approximation; CI = confidence interval.
[a] Model 4 is not a circumplex, just a two-factor model.

Table 4
Acculturative Stress at Time 2 Predicted by Inventory of Interpersonal Problems–Short Circumplex Axes at Time 1, Controlling for Age, Gender, and BSI Scores at Time 2

Predictor	*B*	SE_B	β	ΔR^2
Step 1				.002
Gender	0.11	3.52	.003	
Age	0.31	0.54	.05	
Step 2				.11***
Gender	−1.30	3.35	−.03	
Age	0.26	0.51	−.04	
BSI-T2	0.53	0.13	.33***	
Step 3				.05*
Gender	−2.84	3.33	−.07	
Age	0.06	0.52	.01	
BSI-T2	0.52	0.13	.33***	
DOM-T1	−10.16	3.66	−.23**	
LOV-T1	−1.15	3.69	−.03	
Step 4				.001
Gender	−2.92	3.35	−.07	
Age	0.06	0.52	.01	
BSI-T2	0.51	0.13	.32***	
DOM-T1	−9.93	3.75	−.22**	
LOV-T1	−0.89	3.79	−.02	
DOM × LOV	2.50	7.73	.03	

Note. BSI = psychological symptoms; DOM = agency; LOV = communion; DOM × LOV = interaction between agency and communion. BSI and acculturative stress are from Time 2, whereas agency, communion, and their interaction are from Time 1.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Although at each timepoint, the Cronbach's α for one of the subscales (Vindictive at Time 1, .60, and Domineering at Time 2, .64) was lower than .70, the other subscales all ranged from .70 to .79. Moreover, DeVillis (2012) suggested that α values between .60 and .65 are undesirable but not unacceptable. Comparing across all subscales and the αs in other samples, we consider the relatively lower αs for these two subscales as more likely resulted from chance.

We conducted two evaluations of IIP-SC structural validity (RANDALL and CIRCUM) and found support for circumplexity with the Time 1 data, but less support for circumplexity with the Time 2 data. Reduced sample size due to attrition and just transitioning into a new cultural setting may have contributed to the relative lack of structural validity on IIP-SC at Time 2. We argue that in this sample, the Chinese IIP-SC provided an adequate but imperfect circumplex space. The circumplex structure of the Chinese IIP-SC was well-supported in a mainland Chinese college student sample (Wu et al., 2015), and our study provides additional support for the psychometric properties of IIP-SC in this CISs sample. However, the relatively lower estimated reliability and structural fitness also suggest further refinement of the Chinese IIP-SC.

Interpersonal Problems Change

Through comparing interpersonal problems before and after their cross-cultural transition, we found that CISs' levels of communion decreased over time, whereas their levels of agency and general distress remained unchanged. Previous studies (Vittengl, Clark, & Jarrett, 2003; Wilson, Revelle, Stroud, & Durbin, 2013) have proposed that general distress, agency, and communion are both trait-like and state-like variables, and are malleable through interventions such as cognitive therapy (Vittengl et al., 2003) and short-term psychodynamic therapy (Svartberg, Stiles, & Seltzer, 2004). The decrease in CISs' communion is in line with the malleable nature of interpersonal problems and further extends that interpersonal problems can change across cultural contexts. This change might have been caused by cultural gaps between China and the United States and consequential differences in cross-cultural interpersonal relationships between CISs and their non-Chinese acquaintances. The difficulties that CISs encounter with the loss of belongingness and social support could potentially explain heightened sensitivity and decreased nurturant outreach that they experienced during their cultural transition. This appears to be a critical interpersonal phenomenon for CISs that is associated with acculturative stress. The changes over time corresponded to their cultural transition and inevitable social distance, leading to an increased awareness of and distress over disaffiliative behaviors. It is likely that the distress resulted from confusion or difficulties adjusting to culture in the United States while learning new, culturally appropriate social norms.

Interpersonal Problems and Acculturative Stress

This study is among the first to examine the roles interpersonal problems play in the acculturative stress of CISs. Both before and after the CISs studied in the United States, their overall interpersonal problems were found to be associated with general distress and acculturative stress. The more interpersonal problems they encounter, the higher general distress and more acculturative stress they experienced. These associations seem to suggest that interpersonal problems are indeed an important aspect that influences CISs' mental health. The finding is in line with previous studies that found distress about interpersonal problems to be negatively associated with social adjustment (Gurtman, 1996; Vittengl et al., 2003). Distress about interpersonal problems also predicted the acculturative stress of CISs, which suggests that CISs with greater

Table 5
Acculturative Stress at Time 2 Predicted by Inventory of Interpersonal Problems–Short Circumplex (IIP-SC) Elevation at Time 1, Controlling for Age, Gender, and BSI Scores at Time 2

Predictor	*B*	SE_B	β	ΔR^2
Step 1				.002
Gender	0.11	3.52	.003	
Age	0.31	0.54	.05	
Step 2				.11***
Gender	−1.30	3.35	−.03	
Age	0.26	0.51	−.04	
BSI-T2	0.53	0.13	.33***	
Step 3				.09***
Gender	−2.23	3.20	−.05	
Age	0.15	0.49	.02	
BSI-T2	0.38	0.13	.24**	
ELEV-T1	9.28	2.41	.31***	

Note. BSI and acculturative stress are from Time 2, whereas ELEV is from Time 1. BSI = psychological symptoms; ELEV = elevation of IIP-SC.
** $p < .01$. *** $p < .001$.

interpersonal distress tend to encounter higher stress when acculturating to the United States.

Moreover, CISs' agency scores at both timepoints were found to be negatively correlated with the elevation of interpersonal problems at both timepoints and acculturative stress at Time 2, but not significantly correlated with general psychological distress at Time 2. In part, even at a prearrival, lower agency seemed to be associated with more interpersonal distress among CISs. However, the association strengthened after a period of acculturation. The finding is in line with the hypotheses that CISs with lower agency would experience more acculturative stress, possible due to more difficulties with asserting their needs and/or proactively seeking help when needed.

With further exploration, we found that some prearrival interpersonal problems can be predictive of the CISs' acculturative stress. Agency was found to be significantly predictive of CISs' acculturative stress after some time studying in the United States. In contrast, for most studies with U.S. samples, agency was often not associated with either social adjustment (Vittengl et al., 2003) or psychopathologies such as major depression (Cain et al., 2012) or generalized anxiety disorder (Przeworski et al., 2011). Our finding is interesting in that it seems to suggest that CISs with certain interpersonal problems, in this case lower agency, tend to struggle more with acculturating to the United States' culture and society. Indeed, for CISs, perhaps the most significant cultural adjustments they need to make when moving from a collectivistic to an individualistic culture is to be more personally and socially assertive. Although assertiveness is encouraged for healthy social and interpersonal adjustment in American culture, agency is not often considered essential or virtuous in Chinese cultures where humility and obedience are more culturally fitting (Huang & Gove, 2012; Schwartz, 2006). If being assertive is not culturally normative for CISs, it is understandable that they would feel lost in social situations in which they are expected to be assertive to carry out important social functions such as expressing their needs or frustrations. It appears that socially avoidant CISs may find it extremely overwhelming to have to assert him/herself to be responded to or taken care of in the new environment. In fact, it is likely that CISs who continue to behave in nonassertive and socially avoidant ways experience greater stress, which may keep them from exhibiting more assertive, socially engaging behaviors.

Meanwhile, our hypothesis that higher prearrival communion level would predict higher acculturative stress was not supported. Correlation results suggested that communion seems to be generally unrelated with interpersonal distress, general psychological distress, or acculturative stress among this CISs sample. This finding was, in fact, in line with previous evidence that people's level of communion, similar to agency, was often not associated with either social adjustment (Vittengl et al., 2003) or psychopathologies such as major depression (Cain et al., 2012) or generalized anxiety disorder (Przeworski et al., 2011). Moreover, in light of the temporal change of communion as stated earlier, it can also be explained that the axis of communion was somewhat more malleable and subject to change among this group of CISs. Therefore, the change can be understood as a response to the challenges or stressors in the acculturative process, and that prearrival communion does not necessarily predict future acculturative stress for CISs. The contrast in the significance between agency and communion among CISs in their acculturative process seems to further indicate the unique acculturative challenges they are faced with, and suggest increased needs for interventions.

Practical Implications

Due to the limitation of the study design, we are unable to attribute directionality and causal effects between lower agency and increased acculturative stress among CISs. In other words, we cannot totally rule out the possible effects of acculturative stress on one's sense of agency. In addition, factors such as social support and cross-cultural losses may also contribute to distress during acculturation. However, we still offer some suggestions on possible interventions to address lower agency for CISs in their education and interpersonal relationships.

To address the issue of lower agency, we recommend that CISs (and possibly other ISs) are assessed and have awareness of their interpersonal styles before studying in the United States. The students who seem to struggle with nonassertiveness and social avoidance, could be offered programs that provide support or training on developing interpersonal skills, particularly around assertiveness. IS offices or counseling centers can provide outreach programs such as training workshops focused on how to be appropriately assertive in the American cultural context. Moreover, it is likely that due to their nonassertiveness, CISs' needs are not heard and in turn are ignored by administrative staff or faculty, who are used to only responding to explicit student requests. CISs are also likely to benefit from mental health services that address nonassertiveness and social avoidance ranging from interpersonal processes and support groups to individual psychotherapy. Structured social events to connect ISs with others on campus would also be beneficial.

Limitations

There are several limitations of this study. First, although this Chinese version of the IIP-SC exhibited acceptable reliability and construct validity, its circumplex structure was only confirmed in one of two timepoints. To take advantage of more sophisticated circumplex analyses (Gurtman & Pincus, 2003), further research on the Chinese IIP-SC is needed to confirm its circumplex structure as well as to examine underlying reasons for the lack of fitness among the CIS population when residing in a host country. Second, our timeframe was limited. Although the CISs begin to experience acculturative stress after their first semester of studying in the United States, the longer term trajectories of stress and interpersonal problems, as they have more time to adjust in this new cultural environment, remain unknown. Third, participants of this study were undergraduate or graduate students, representing a large part of CISs. However, the findings may not be generalizable for CISs who arrived in the United States for high school or even earlier.

Future Directions

For future research, it will be interesting to examine the effects of different interventions addressing the CISs' nonassertive and socially avoidant tendencies, and to investigate how increased awareness and skills in this area can help the CISs better adjust to their new environment. We also recommend more research on the

validation of the IIP-SC among CISs and the general Chinese population, paying special attention to the assertiveness aspect. Longitudinal studies that examine the acculturative adjustment over longer periods of time (e.g., 2–4 years) may offer a better understanding of the longer term process. Moreover, other types of culturally salient interpersonal problems such as family perfectionism and interpersonal shame, which are not necessarily addressed by IIP-SC, can also be included in future research to better understand CISs' experiences. Finally, it would also be important to investigate the mechanisms at work around nonassertiveness and social avoidance predicting acculturative stress for CISs. Using qualitative approaches and/or mediation analyses would provide a better understanding of the mechanisms. Researchers can also further investigate the topic of interpersonal problems with ISs from other countries and those studying at various educational levels (secondary school, undergraduate, and graduate).

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