

Stress-Driven Spending: Correlates of International Students' Adjustment Strains and Compulsive Online Buying

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ABSTRACT

We investigated international students' stress-driven spending behavior by focusing on the psychological and behavioral consequences of the strains they experience during the adjustment process in the U.S. We found that certain adjustment strains significantly lowered international students' self-esteem, which further affected their happiness and engagement in compulsive online buying. This study highlights the importance of understanding underlying drivers and consequences of international students' adjustment strains to facilitate better adaptation to a foreign culture and to prevent negative consumption tendencies.

Keywords: adjustment strains, compulsive online buying, happiness, international students, self-esteem

Approximately 1.04 million international students studied at U.S. colleges and universities during the 2015-2016 academic year (National Association of Foreign Student Advisers, 2016), an increase of 72% over the past 15 years (Institute of International Education, 2015). The top ten sending countries are China, India, South Korea, Saudi Arabia, Canada, Japan, Vietnam, Taiwan, Mexico, and Brazil (U.S. Immigration and Customs Enforcement, 2015). International students bring great economic benefits to

American society and universities, spending \$27 billion in 2015 (Institute of International Education, 2015). However, international students often face adjustment problems, mainly due to differences in language, educational systems, and social norms, as well as homesickness, financial problems, and sometimes racial discrimination (Gareis, Merkin, & Goldman, 2011; Wehrly, 1988). Although researchers have studied international students' adjustment strains, little is known about how these strains affect students' shopping and spending. The literature suggests that a sense of social rejection, low self-esteem, unhappiness, and other negative feelings experienced during the adaptation process significantly alter consumption and spending behavior (Baumeister, DeWall, Mead, & Wohs, 2008). Although consumers may shop as a coping strategy to temporarily relieve their negative mood (Atalay & Meloy, 2011), repetitive stress-driven consumption may promote compulsive buying, thus generating long-term negative consequences (Roberts & Jones, 2001).

Therefore, understanding underlying drivers and consequences of international students' adjustment strains is critical to facilitate better adjustment to U.S. culture and to prevent negative consumption tendencies. To address this gap in the literature, we examine (1) the extent to which international students' adjustment strains influence self-esteem and happiness and (2) how these factors (adjustment strains, self-esteem, and happiness) affect compulsive online buying. Given the increasing consumption power, population size, and societal influence of international students in American colleges and universities (Jordan, 2015), the finding of this study will provide important implications for developing policies or programs for international students in higher education in the U.S.

LITERATURE REVIEW

International Students' Adjustment Strains

International students' adjustment strains (ISAS), also known as acculturative stressors, are defined as the everyday problems that international students contend with when living in foreign countries (Crano & Crano, 1993). Previous studies have identified four major sources of adjustment strains for international students in higher education: academic strains, language strains, personal strains, and social strains (Chen, 1999; Crano & Crano, 1993; Gebhard, 2012; Smith & Khawaja, 2011).

Academic strains, or problems related to schooling, are a significant predictor of life stress (Smith & Khawaja, 2011). ISAS related to education factors mostly come from adjusting to American education systems (e.g.,

different teaching styles), concerns about poor academic performance, and different relationship patterns between teachers and students, problems which can result in lowered confidence (Crano & Crano, 1993; Smith & Khawaja, 2011). Academic strains for some international students may also be intensified by high familial expectations, and academic failure affects international students' self-esteem and psychological well-being (Mori, 2000). Because most international students invest considerable effort and financial resources in studying abroad, the pressure of high expectations from self and family and a sense of academic failure negatively influence happiness (Liu & Winder, 2014; Lu & Gilmour, 2006).

Furthermore, international students often face difficulties in finishing assignments on time, understanding lectures, and expressing their thoughts (Gebhard, 2012; Smith & Khawaja, 2011). Because language is a key factor interrelated with many academic and sociocultural strains, language barriers and continuous communication difficulties can lead to psychological distress, reducing students' self-esteem, making them insecure, and inhibiting social interactions (Barratt & Huba, 1994; Chen, 1999). Worse, language barriers create a negative cycle: the poorer international students' English skills are, the less they want to interact socially, so that their English skills do not improve and they feel still more adjustment strains (Chen, 1999).

Personal strains involve personal experiencing of negative feelings (Crano & Crano, 1993). International students tend to have less successful friendships with Americans due to problems with communication and language (Gareis et al., 2011). Less successful friendships, in turn, contribute to loneliness and homesickness (Smith & Khawaja, 2011) and further depression (Wehrly, 1988).

Social strains involve negative feelings experienced in social life, such as feelings of isolation, rejection, exclusion, and discrimination (Crano & Crano, 1993). Many international students feel rejected, excluded (Edwards-Joseph & Baker, 2012; Liu & Winder, 2014; Searle & Ward, 1990) or discriminated against (Poyrazli & Lopez, 2007). According to social identity theory, an individual's identity derives from knowledge of his/her belonging and identifying with a certain social category (Tajfel, 1978). International students can be considered a minority group, but since most were not regarded as members of a minority group before coming to the U.S., most of them have little experience with minority group identification (Schmitt, Spears, & Branscombe, 2003). As a result, international students often experience identity conflicts, a key source of culture shock which can trigger feelings of sadness, anger, low self-esteem, and defensiveness (Kim,

2001). Perceived devalued identity further affects happiness by lowering self-esteem (Roccas, Horenczyk, & Schwartz, 2000). Another major social concern among international students is strains from dating practices and male/female relationships (Poyrazli & Kavanaugh, 2006; Yi, Lin, & Kishimoto, 2003). International students are likely to have lower confidence in their self-esteem and to experience unhappiness when they struggle with social relations with significant others, when they feel uncomfortable with social interactions, or when they are confused about morals and sexual customs in a foreign culture.

Self-Esteem and Happiness

Self-esteem, which can be global or domain-specific, is defined as individuals' attitudes toward their own value and worth as a person (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). Rosenberg et al. (1995) found that global self-esteem is more strongly related to aspects of psychological well-being such as happiness, while specific domains of self-esteem (e.g., academic self-esteem) are more strongly related to behavior outcomes (e.g., academic performance). This study examines how international students' adjustment strains influence global self-esteem and further affect overall happiness. Studies have found that students who are psychologically distressed during the adjustment process tend to show lower self-esteem than students who are well-adjusted (Wang et al., 2012).

Happiness has been defined as subjective well-being (Lu & Gilmour, 2006) and has been described based on aspects of life satisfaction, momentary pleasures, or positive subjective experiences (Flynn & MacLeod, 2015). Many studies have found that self-esteem is a significant predictor of psychological well-being (Furnham & Cheng, 2000; Nesdale & Mak, 2003; Rosenberg et al., 1995). In particular, Furnham and Cheng (2000) found that self-esteem was the most dominant and powerful predictor of happiness among young consumers. Thus, when international students have impaired self-esteem from adjustment strains, they are likely to experience less happiness.

Compulsive Online Buying

Compulsiveness has generally been regarded as a psychiatric disorder (O'Guinn & Faber, 1989) or as a lack of impulse control (Billieux, Rochat, Rebetz, & Van der Linden, 2008; Christenson et al., 1994). O'Guinn and Faber (1989) defined compulsive buying as "a response to an uncontrollable drive or desire to obtain, use or experience a feeling, substance, or activity that leads an individual to repetitively engage in a behavior that will

ultimately cause harm to the individual and/or others” (p. 148). Christenson et al. (1994) defined compulsive buying as repeated, uncontrolled, and excessive impulsive buying behavior which leads to problems such as debts, family conflict, and guilty feelings.

Gronmo (1988) argued that people who perceive psychosocial deficiencies may engage in shopping to compensate for these deficiencies and the lack of self-esteem or self-actualization may explain the underlying mechanism of compensatory consumption behavior. Thus, later researchers combined the phenomenon of compulsive buying with other social psychological concepts, such as materialistic values, and viewed compulsive buying as compensatory behavior to improve self-image, self-esteem, or relationships with others (Dittmar, 2005).

Studies have found that younger people (Dittmar, 2005) and people with negative mood (Billieux et al., 2008) tend to engage in compulsive buying. Furthermore, compulsive online buying has risen among young adults along with the widespread use of mobile devices (Manchiraju, Sadachar, & Ridgway, 2016). Consumers with higher compulsive buying tendencies tend to engage in online buying (Kukar-Kinney, Ridgway, & Monroe, 2009). Daily deals available on websites urge compulsive online buying by increasing time or social pressures (Kukar-Kinney, Scheinbaum, & Schaefer, 2016). However, compulsive online buying has negative consequences, such as overspending or control disability, thereby harming one’s physical and mental health, social and financial well-being (Dittmar, Long, & Bond, 2007).

Drivers of Compulsive Buying

According to symbolic self-completion theory, people’s activities are intended to substantiate their definition of themselves, a definition that can indicate their identity (Gollwitzer, Wicklund, & Hilton, 1982). People with feelings of powerlessness or low self-esteem tend to look for high-status products to compensate themselves (Rucker & Galinsky, 2008) or to buy things to make themselves feel more worthy (Kukar-Kinney, Ridgway, & Monroe, 2012). Stress, negative mood, and low self-esteem are positively associated with compulsive buying behavior. For example, O’Guinn and Faber (1989) found that people with compulsive buying tendencies tend to have lower self-esteem and the ability to fantasize, which helps them forget about personal problems caused by low self-esteem. Hanley and Wilhelm (1992) further stated that compulsive consumers have a stronger belief that money can enhance self-esteem than do those with normal consumption behavior. Accordingly, compulsive buyers tend to display high intention to

buy prestige products to increase their self-worth and self-completion (Kukar-Kinney et al., 2012). Stress and anxiety may motivate compulsive buying (DeSarbo & Edwards, 1996). In a similar vein, Rick, Pereira, and Burson (2014) found that sadness, which is associated with an individual's feeling of lack of personal control over the environment, can be significantly alleviated through shopping because shopping restores a sense of control during the selection process. Therefore, international students' feelings of stress, rejection, and lack of control may lead to low self-esteem and unhappiness (Crano & Crano, 1993; Fisher & Hood, 1987). Such psychological impairments may influence international students to shop to improve their mood and self-esteem.

Accordingly, the following hypotheses are proposed:

- H₁: The higher the ISAS (a. academic, b. language, c. personal, and d. social strains), the lower international students' self-esteem.
- H₂: The higher the ISAS (a. academic, b. language, c. personal, and d. social strains), the lower international students' happiness.
- H₃: The lower international students' self-esteem, the lower their happiness.
- H₄: The lower international students' self-esteem, the higher their engagement in compulsive online buying.
- H₅: The lower international students' happiness, the higher their engagement in compulsive online buying.
- H₆: The higher the ISAS (a. academic, b. language, c. personal, and d. social strains), the higher international students' engagement in compulsive online buying.

RESEARCH METHOD

Data Collection

International students enrolled at a major southeastern university were selected as a convenience sample for this study. As of Spring 2016, this university had 1,639 international students (male = 1,059, female = 580), including 514 undergraduate students, 1,123 graduate students, and two professional students. The top sending countries were China, India, Brazil, South Korea, Bangladesh, Saudi Arabia, Turkey, and Iran. The data were

collected using Qualtrics, an online survey. The International Students Organization electronically distributed the survey to their email list of 1350 students. International students who were at least 19 years old and who had studied at least one semester in the U.S. were eligible for this study. Students who had studied less than one semester were excluded from this study because their self-esteem and happiness were less likely to be significantly affected by the strains experienced in a short time period. In total, 210 subjects clicked on the survey (response rate = 15.56%). After eliminating one ineligible, 56 incomplete and seven straight-lining responses, a total of 146 responses were usable for analysis. Twenty participants were randomly drawn to receive \$25 store gift cards.

Instruments

The survey questionnaire was developed by modifying existing scales. For ISAS, 28 out of 38 items in Crano and Crano's (1993) scale were used. The questions about relationships with host families and concerns with food differences and health problems were excluded because most university students live in dorms or apartments rather than living with host families and more dietary options are available now than in 1993. The original items were slightly modified to measure adjustment strains experienced in the U.S. In addition, the verb "trouble" was replaced with the verb "distress" to suggest the level of strains experienced. Seven items were used for academic strains; six for language strains; nine for personal strains; and six for social strains. The reported reliabilities for each scale were .69, .86, .80, and .73 respectively (Crano & Crano, 1993).

Self-esteem was measured by the Texas Social Behavior Inventory scale, which includes 16 items (Helmreich & Stapp, 1974). The reliability of the original scale was recently reported as .82 (Robins, Hendin, & Trzesniewski, 2001). Happiness was measured by the five-item life satisfaction scale (Diener, Emmons, Larsen, & Griffin, 1985). The reported reliability of the original scale was .87. The life satisfaction scale was adopted because the study examined the overall happiness (i.e. subjective well-being) of international students. The scale was slightly modified to include "in the U.S." in each item.

To measure engagement in compulsive online buying, d'Astous, Maltais, and Roberge's (1990) eleven-item compulsive buying scale was used. The scale was modified to reflect the context of online shopping (e.g., "I bought a product online that I did not need even when I knew I had very little money left"). In addition, the items were modified from the present tense to the past tense to measure the participants' actual behavior, rather

than motivation or behavioral tendency. The original scale had the reported reliability of .78. Given their correlation with compulsive buying, materialism (Dittmar, 2005) and impulsive buying tendency (Billieux et al., 2008) were measured and tested as covariates of compulsive buying. Eight items were adopted from Trinh and Phau's (2012) materialism scale, including four items for material success (e.g., "I like to own things that make people think highly of me") and four items for material happiness (e.g., "Material possessions are important because they contribute a lot to my happiness"). The reported reliability ranged from .86 to .93 for material success and .81 to .86 for material happiness (Trinh & Phau, 2012). Impulsive buying tendency was measured by Rook and Fisher's (1995) nine-item buying impulsiveness scale (e.g., "I often buy things spontaneously"). The reported reliability was .88 (Rook & Fisher, 1995).

For all the scales above, seven-point Likert-type scales were used (1 = Strongly disagree and 7 = Strongly agree; 1 = Never and 7 = Always for engagement in compulsive online buying). The survey began with two screening questions about age and the length of time spent in the U.S. Participants were also asked what year they came to study in the U.S. On the last page, they were asked about demographic characteristics including gender, nationality, class standing, and monthly income, which included assistantships and allowances from their family.

To determine whether international students could understand the survey, a pretest was conducted with non-native English speakers with low English proficiency, recruited from the personal network of the primary investigator. Seven international students (two undergraduate and five graduate) from China, South Korea, and Iran reviewed the questionnaire. Questions they found difficult to understand were revised with easier words or expressions. For example, several participants could not understand the word "treatment" in the question "the treatment I receive in the U.S. at social functions distresses me." Therefore, we changed the wording to "I am distressed because of the way other people speak to me and act toward me at social functions in the U.S." The participants were also confused by four items from the self-esteem scale: "I am a good mixer;" "I would describe myself as one who attempts to master situations;" "other people look up to me;" and "I make a point of looking other people in the eye." These items were revised to "I am good at approaching other people at social functions;" "I would describe myself as one who tries to feel in control of a situation;" "other people respect and admire me;" and "I always try to look straight at people when I talk to them." In the main test, a response box was provided on every page of the online survey where respondents could indicate any

words or questions that confused them. Moreover, the instructions for the survey informed participants that they could use a dictionary while taking the survey.

RESULTS

Sample Profile

The age of the respondents ranged from 19 to 40 (mean age = 28.2) and 55.5% were male. The majority were graduate students (85.6%) and had been in the U.S. fewer than five years (80.80%). About 78.8% of the respondents were from Asian countries, including 39.0% from China, 14.4% from India, 4.8% from South Korea, 4.8% from Bangladesh, and 14.3% from other Asian countries. The remaining respondents came from the Middle East (6.2%), Europe (5.5%), Latin America (4.1%), Africa (3.4%), and Oceania (1.4%). About 24.7% had a monthly income (including assistantships and allowances from their family) of \$501 to \$1000; 34.9% had \$1001 to \$1500; and 22.6% had \$1501 to \$2000.

Factor Analysis and Reliability

Few respondents left comments about confusing words or questions. Therefore, all items were used for the next analysis. Exploratory factor analysis (EFA) was performed to explore the underlying structure of ISAS; self-esteem; happiness; compulsive online buying; and two covariates, materialism and impulsive-buying tendency. Principal components analysis (PCA) with varimax rotation was used. A Cronbach's α value of .70 or higher shows good reliability of the scale (Nunnally & Bernstein, 1994).

EFA was run for ISAS. Cross-loaded items and items below .6 in the factor loadings were eliminated one by one. In total, nine items were dropped. Nineteen items were submitted to the next analysis: four for academic strains, six for language strains, four for personal strains, and five for social strains. Nineteen items confirmed the four dimensions (Table 1). The Cronbach's α s were .78, .93, .86, and .88 respectively for academic, language, personal, and social strains, showing the internal consistency of the items. The Eigenvalues ranged from 1.35 to 7.33 and the four dimensions explained 70.05% of the total variance. Language strains accounted for the highest variance, 38.59%.

EFA was conducted for self-esteem and happiness (Table 2). The 5-item happiness scale was uni-dimensional (Eigenvalue = 2.35, Total variance explained = 13.85%, Cronbach's α = .87). However, the 16-item self-esteem scale, which was reported to be uni-dimensional in the original study,

showed three underlying dimensions in this study. Accordingly, each dimension was named based on the items loaded in each dimension. The first factor was named “social competence” and had six items, which explained 32.20% of the total variance. The second factor was named “social expression confidence” and had four items, which explained 12.27% of the total variance. The third factor was named “social dominance” and had two items, which explained 6.80 % of the total variance. The Eigenvalues ranged from 2.09 to 5.47. The self-esteem and happiness scales explained 65.11% of the total variance. The Cronbach’s α s were above .70, except for social dominance, which was .62.

Table 1. EFA results for ISAS.

Measurement item	Factor loading
<i>Academic strains</i> ($\alpha = .78$; EV = 1.36; VE = 7.13%)	
Being unable to concentrate on my studies in the U.S. distresses me.	.83
Feeling uninterested in the university I am attending in the U.S. distresses me.	.84
My concern with grades in the U.S. distresses me.	.61
Relationships between teachers and students in the U.S. distress me.	.62
<i>Language strains</i> ($\alpha = .93$; EV = 7.33; VE = 38.59%)	
My difficulties in speaking English distress me.	.84
I am distressed when I attend classes and lectures in English because I don't understand English very well.	.83
I am distressed when I read textbooks and novels written in English because I don't understand them well.	.87
Not being able to understand slang phrases in the U.S. distresses me.	.74
My limited English vocabulary distresses me.	.88
Knowing that I need help with English distresses me.	.82
<i>Personal strains</i> ($\alpha = .86$; EV = 1.64; VE = 8.63%)	
Being lonely in the U.S. distresses me.	.74
Feelings of homesickness in the U.S. distress me.	.87
Frequently crying or feeling depressed in the U.S. distresses me.	.69
Feeling that I would prefer to go home immediately distresses me.	.75
<i>Social strains</i> ($\alpha = .88$; EV = 2.98; VE = 15.69%)	
The relationship between men and women in the U.S. distresses	.78

Measurement item	Factor loading
me.	.83
The dating practices of people in the U.S. distress me.	.86
Sexual customs in the U.S. distress me.	.70
I am distressed because I feel uncomfortable among groups of people in the U.S.	.76
I am distressed because I feel confused about morals in the U.S.	

Note. EV = Eigenvalue, VE = variance explained.

Next, EFA was run for the 11 items of the compulsive online buying scale. The results confirmed the uni-dimensionality of the scale (Eigenvalue = 7.13, Total variance explained = 64.79%). All factor loadings were above .70 and Cronbach’s α was .94. Lastly, EFA was run with materialism and impulsive buying tendency as covariates for compulsive online buying. The eight items turned out to be one dimension (Eigenvalue = 5.57, Total variance explained = 69.61%, Cronbach’s α = .94). Of the nine items for impulsive buying tendency, a reverse-coded item turned out to be in a different factor and was dropped. The final eight items confirmed the uni-dimensionality (Eigenvalue = 5.50, Total variance explained = 61.04%, Cronbach’s α = .93).

Table 2. EFA results for self-esteem and happiness.

Measurement item	Factor loading
Self-esteem	
<i>Social competence</i> (α = .87; EV = 5.47; VE = 32.20%)	
I would describe myself as self-confident.	.66
I feel confident of my appearance.	.76
I am good at approaching other people at social functions.	.70
I enjoy social gatherings just to be with people.	.78
I always try to look straight at people when I talk to them.	.73
I have no doubts about my social competence.	.76
<i>Social expression confidence</i> (α = .79; EV = 2.09; VE = 12.27%)	
I am not likely to speak to people until they speak to me. ®	.82
When in a group of people, I have trouble thinking of the right things to say. ®	
When in a group of people, I usually do what the others want rather than make my own suggestions. ®	.78
I cannot seem to get others to notice me. ®	.74

Measurement item	Factor loading
Social dominance ($\alpha = .62$; EV = 1.16; VE = 6.80%)	
When I'm in a disagreement with other people, my opinion usually prevails.	.74
I would describe myself as one who tries to feel in control of a situation.	.87
Happiness ($\alpha = .87$; EV = 2.35; VE = 13.85%)	
In most ways my life in the U.S. is close to my ideal.	.77
The conditions of my life in the U.S. are excellent.	.84
I am satisfied with my life in the U.S.	.85
So far I have gotten the important things I want in life in the U.S.	.79
If I could live my life over, I would change almost nothing.	.71

Note. EV = Eigenvalue, VE = Variance Explained, ® Reverse coded.

Correlations Among ISAS

Pearson correlation was additionally run for ISAS to examine the relationships among the four adjustment strains. Academic strains were positively correlated with language ($r = .379, p < .01$), personal ($r = .488, p < .01$), and social strains ($r = .440, p < .01$). Language strains were positively correlated with personal ($r = .381, p < .01$) and social strains ($r = .300, p < .01$). Lastly, personal and social strains were positively correlated ($r = .537, p < .01$) and showed the highest correlation. Therefore, an increase in one dimension of the adjustment strains significantly increased other dimensions.

Hypothesis Testing

As discussed earlier, because the self-esteem scale was multi-dimensional in this study, Hypotheses 1 and 3 ~ 4 were revised as follows:

- H₁₋₁: The higher the ISAS (a. academic, b. language, c. personal, and d. social strains), the lower the international students' social competence.
- H₁₋₂: The higher the ISAS (a. academic, b. language, c. personal, and d. social strains), the lower the international students' social expression confidence.

- H₁₋₃: The higher the ISAS (a. academic, b. language, c. personal, and d. social strains), the lower the international students' social dominance.
- H₃: The lower the international students' self-esteem (a. social competence, b. social expression confidence, and c. social dominance), the lower their happiness.
- H₄: The lower the international students' self-esteem (a. social competence, b. social expression confidence, and c. social dominance), the higher their engagement in compulsive online buying.

All hypotheses except for H2 and H3 were tested by conducting hierarchical multiple regression analysis to control for the effects of respective covariates. Multiple linear regression analysis was run for H2 and H3. H1-1 ~ H1-3 proposed the negative effects of four adjustment strains on the three dimensions of self-esteem (i.e., social competence, social expression confidence, and social dominance). Previous studies have shown that men are slightly more positive than women in global self-esteem (Kling, Hyde, Showers & Buswell, 1999). Therefore, gender was entered as a covariate. Regarding H1-1, the overall model with gender and four adjustment strains was statistically significant ($F = 3.141, p < .05$) and explained 10.1% of variability in social competence. Gender had no significant effect on social competence ($\beta = .043, p = .601$). Among the four strains, social strains showed a significant negative effect on social competence ($\beta = -.309, p < .01$) (Table 3). Therefore, H1-1d was supported, while H1-1a ~ H1-1c were rejected.

Table 3. The effect of ISAS on social competence.

Variable	β	t	R	R^2	ΔR^2
Model 1 (Covariate)			.026	.001	
Gender	.026	.315			
Model 2 (Overall)			.318	.101	.100
Gender	.043	.525			
Academic strains	.073	.749			
Language strains	-.145	-1.623			
Personal strains	.069	.653			
Social strains	-.309	-3.152**			

Note. ** $p < .01$

Table 4. The effect of ISAS on social expression confidence.

Variable	β	t	R	R^2	ΔR^2
Model 1 (Covariate)			.006	.000	
Gender	-.006	-.072			
Model 2 (Overall)			.616	.380	.380
Gender	.083	1.211			
Academic strains	-.038	-.476			
Language strains	-.106	-1.432			
Personal strains	-.241	-2.759**			
Social strains	-.385	-4.175***			

Note. ** $p < .01$, *** $p < .001$

Regarding H1-2, the overall model with gender and four adjustment strains was significant ($F = 17.150, p < .001$) and explained 38% of variability in social expression confidence. Gender was not significant ($\beta = .083, p = .942$). Social strains ($\beta = -.385, p < .001$) and personal strains ($\beta = -.241, p < .01$) showed significant negative effects on social expression confidence (Table 4). Therefore, H1-2c and H1-2d were supported, while H1-2a and H1-2b were rejected. Regarding H1-3, the overall model with gender and four adjustment strains was not significant ($F = .881, p = .495$) and explained only 3.10% of variability in social dominance. None of these variables significantly influenced social dominance. Therefore, H1-3 was rejected.

H2 proposed the negative effects of four adjustment strains on happiness. The overall model with four adjustment strains was statistically significant ($F = 6.168, p < .001$) and explained 14.90% of the variability in happiness. Specifically, language strains ($\beta = -.190, p < .05$) and personal strains ($\beta = -.240, p < .05$) showed significant negative effects on happiness (Table 5). Therefore, H2b and H2c were supported, while H2a and H2d were rejected.

Table 5. Result of multiple regression analysis for the effect of ISAS on happiness.

Variable	β	t	B	R^2
				.149
Academic strains	-.083	-.880	-.079	
Language strains	-.190	-2.190*	-.160	
Personal strains	-.240	-2.412*	-.196	
Social strains	-.045	.469	.044	

Note. * $p < .05$

H3 proposed the positive effects of three dimensions of self-esteem on happiness. The overall model with three dimensions of self-esteem was significant ($F = 13.809, p < .001$) and explained 22.60% of variability in happiness. Specifically, social competence positively affected happiness ($\beta = .475, p < .001$), whereas the other two dimensions were not significant (Table 6). Therefore, H3a was supported, while H3b and H3c were rejected.

H4 and H5 proposed the negative effects of self-esteem and happiness on engagement in compulsive online buying. Women and people with a higher income are more likely to engage in compulsive buying than are men and people with a lower income (Dittmar, 2005), and materialism and impulsive buying tendency are positively related to compulsive buying (Billieux et al., 2008; Dittmar, 2005). Therefore, gender, income, materialism, and impulsive buying tendency were entered as covariates. The result showed that the model with the four covariates was significant ($F = 20.105, p < .001$) and accounted for 36.30% of variability in compulsive online buying. The overall model with three self-esteem dimensions, happiness, and four covariates was significant ($F = 10.680, p < .001$) and explained 38.4% of variability in engagement in compulsive online buying. This overall model showed 2.10% improvement in variability. Impulsivity was a significant covariate ($\beta = .541, p < .001$). Social expression confidence was marginally significant at the 90% confidence level and negatively affected engagement in compulsive online buying ($\beta = -.130, p = .072$). Social competence ($\beta = -.037, p = .660$), social dominance ($\beta = -.020, p = .785$), and happiness ($\beta = .087, p = .264$) were not significant (Table 7). Therefore, H4 and H5 were rejected, except for H4b, which was marginally significant.

Table 6. The effect of self-esteem on happiness.

Variable	β	t	B	R^2
				.226
Social Competence	.475	5.895***	.513	
Social Expression Confidence	.049	.633	.050	
Social Dominance	-.107	-1.376	-.121	

Note. *** $p < .001$

Table 7. The effect of self-esteem and happiness on compulsive online buying.

Variable	β	t	R	R^2	ΔR^2
Model 1 (Covariate)			.603	.363	
Gender	.104	1.552			
Income	-.103	-1.526			
Materialism	.040	.408			
Impulsivity	.566	5.747			
Model 2 (Overall)			.620	-.384	.021
Gender	.107	1.571			
Income	-.112	-1.656			
Materialism	.062	.625			
Impulsivity	.541	5.436***			
Social competence	-.037	-.441			
Social expression confidence	-.130	-1.816†			
Social dominance					
Happiness	-.020	-.273			
	.087	1.122			

Note. † $p < .10$, *** $p < .001$

H6 proposed the positive effects of four adjustment strains on engagement in compulsive online buying. The results showed that the model with four covariate variables (gender, income, materialism, and impulsivity) was significant ($F = 20.105, p < .001$) and accounted for 36.30% of variability in compulsive online buying. The overall model with four adjustment strains and four covariates was significant ($F = 11.911, p < .001$) and explained 41.00% of variability in compulsive online buying. The overall model showed improvement in variability by 4.70%. Specifically, impulsivity was a significant covariate ($\beta = .523, p < .001$) and income was marginally significant at the 90% confidence level ($\beta = -.115, p = .088$). However, in contrast with previous findings, income negatively affected engagement in compulsive online buying: respondents with a lower income showed slightly higher engagement. When the significant effects of impulsivity and income were controlled for, social strains still positively affected compulsive online buying ($\beta = .182, p < .05$) (Table 8). Therefore, H6a ~ H6c were rejected and H6d was supported. Figure 1 demonstrates the significant results of the hypothesis testing.

Table 8. The effect of ISAS on compulsive online buying.

Variable	β	t	R	R^2	ΔR^2
Model 1 (Covariates)			.603	.363	
Gender	.104	-.672			
Income	-.103				
Materialism	.040				
Impulsivity	.566				
Model 2 (Overall)			.640	.410	.047
Gender	.073	1.078			
Income	-.115	-1.716 [†]			
Materialism	.020	.202			
Impulsivity	.523	5.319***			
Academic Strains	-.014	-.169			
Language Strains	-.006	-.077			
Social Strains	.182	2.195*			
Personal Strains	.082	.938			

Note. [†] $p < .10$, * $p < .05$, *** $p < .001$

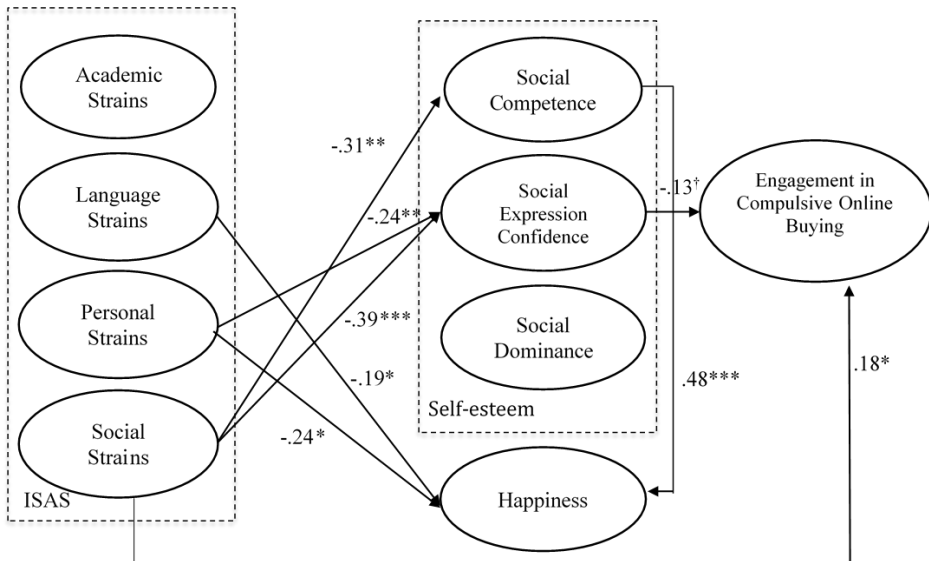


Figure 1. Results of hypotheses testing note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

DISCUSSION AND CONCLUSIONS

We examined the extent to which adjustment strains faced by international students reduced self-esteem and happiness and how these factors impacted engagement in compulsive online buying. First, we found that social strains significantly reduced international students' social competence and social expression confidence, which are dimensions of self-esteem. Social strains arise from trouble interacting with people and understanding morals and male/female relationships. International students' social strains caused by trouble with interacting with groups of people may indicate their lack of confidence as members of a minority group in the U.S. (Schmitt et al., 2003). Such devalued identity among international students in turn triggers negative experiences such as feelings of sadness and low self-esteem (Kim, 2001). This study implies that social strains experienced in a foreign culture reduce international students' social interactions by creating social anxiety (Yang, Noels, & Saumure, 2006), which significantly weakens competence in their social circles and confidence in expressing their opinions. In addition, we found that personal strains, which arise from feelings of loneliness, homesickness, and depression, significantly lowered social expression confidence. Given our findings that personal strains are positively correlated with academic, social, and especially language strains, personal problems associated with language barriers and difficulties with academics and social relationships significantly damaged international students' self-esteem by lowering social expression confidence.

Furthermore, we found that international students' happiness was determined by language and personal strains and social competence. Higher language and personal strains and higher social incompetence led to unhappiness. These findings reiterate that language is a critical barrier to international students' social interactions and happiness (Chen, 1999; Smith & Khawaja, 2011). This finding generally supports the idea that self-esteem determines psychological well-being (Furnham & Cheng, 2000; Nesdale & Mak, 2003; Rosenberg et al., 1995). More specifically, this finding supports previous studies which showed that international students with less successful relationships in their social circles (i.e., low social competence), tended to experience more loneliness and homesickness (Smith & Khawaja, 2011) as well as more depression (Wehrly, 1988) than did those with more successful relationships. Thus, developing positive self-esteem through strong social competence is critical for international students' happiness in a foreign culture.

Third, even after controlling for the highly significant influence of impulsive buying tendency (covariate) on compulsive online buying, we found a marginally significant relationship between social expression confidence and compulsive online buying. When international students have lower self-esteem due to the lack of social expression confidence, they tend to engage in compulsive online buying to recover their devalued identity. Similarly, we found that after controlling for the significant impact of impulsivity and the marginal influence of income, international students' social strains triggered compulsive online buying. These findings imply that psychological problems associated with social interactions (e.g., high social strains, low social expression confidence, and social exclusion) tend to drive people to spend and consume more (Mead, Baumeister, Stillman, Rawn & Vohs, 2011).

IMPLICATIONS

This study contributes to the higher education and compulsive buying literature by empirically investigating the underlying psychological mechanism of international students' spending behavior driven by adjustment strains in the U.S. This study demonstrated that international students' strains are related to low self-esteem, unhappiness, and high engagement in compulsive online buying. Our findings suggest that one of the most fundamental ways to solve many of international students' problems is to enhance their language skills. International students' language barriers tend to create social anxiety (Yang et al., 2006), which in turn limits opportunities to improve language skills. Social interactions both improve international students' language and social communication skills and reduce personal strains, such as feelings of loneliness, homesickness, and depression. Improving these skills will further enhance their self-esteem and happiness during the adjustment process. Moreover, social strains and social expression confidence were significant drivers of compulsive online buying, suggesting that high social strains and low social expression confidence may signal rising problems with international students' spending behavior.

We demonstrate the need for universities and colleges to develop programs or policies to help international students better adjust to the U.S. academic and social systems, and to identify and reduce problems such as psychological impairment and compulsive consumption behavior in the early stages. Given that younger consumers tend to have more frequent access to the Internet, making it easier to engage in negative consumption

behavior (Manchiraju et al., 2016), the development of early interruption programs is strongly recommended. For example, higher education institutions may use the scales used in this study to periodically measure ISAS, self-esteem, and happiness and to identify any decreases in the scores. In addition, organizations for international students could provide free conversation partners or tutoring services on an individual or small group basis to help the students improve English skills and social skills, or develop social activities or cultural events to get international students actively involved in social interactions. University residence halls could also consider an international roommate-pairing program to improve international students' academic success and life satisfaction (Tolman, 2017). Furthermore, educators can use group assignments to naturally encourage international students to interact with students of other nationalities. Teachers and academic advisors can help international students better adjust by paying close attention to their academic performance and social relationships. Most importantly, international students should realize the importance of social interaction and the negative consequences of social isolation when studying in a foreign culture, and should learn how to actively cope with cultural shock and adjustment strains. International students are highly encouraged to take advantage of supporting programs, events, or activities offered to them by the university or community.

This study has several limitations. Due to the relatively small sample size, some relationships may have appeared marginally significant or non-significant. In addition, we used a convenience sample of students in a university, limiting the generalizability of the findings. Also, the majority of the respondents in this study were from Asia, particularly China. Although 76% of international students in the U.S. are from Asian countries (U.S. Immigration and Customs Enforcement, 2015), the generalizability of the study findings is limited because of the lack of non-Asian respondents. Future studies may test the proposed relationships with students with more diverse nationalities and more balanced groups of respondents. Lastly, the samples were mainly graduate students. Future research may target undergraduate students and investigate whether there are any differences in perceptions between undergraduate and graduate students.

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