

Identity Conflict in Cultural Transitions: A Case Study of Chinese Academic Sojourners in Colorado, U.S.A.

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Recent years have witnessed an increasing need for understanding sojourners' acculturation experiences because of the rising number of international academic sojourners all over the world. This research investigated the identity conflict of Chinese academic sojourners in Colorado, U.S.A. and interpreted their acculturative behaviors and attitudes, acculturative adaptation and stress, etc. Participants of this research included Chinese graduate students, postdoctoral fellows, and visiting scholars from three academic institutions in Boulder, Colorado. Results have indicated that sojourners inevitably develop new cultural identities as they participate in various activities with a new cultural group. The process through which sojourners form new social identities in cultural environments is essential because they can give sojourners new self-categories, as well as values, attitudes, and behaviors maintained with those identities. New cultural identities need to be developed in order to forge sojourners' lives in the new society.

Keywords: cultural transitions, identity conflict, sojourners

In recent years, social psychology has gained insights into the nature and consequences of cultural transitions. The core values and perceptions of our home culture shape the mental framework with which we gradually come to define who we are and what makes us. Berry (1980) demonstrates that culture provides a framework for self-categorization and a framework for regulation of social relationships. In our communication with culturally similar people, cultural identity may be unrecognized, but it exists and serves as the expected standard in people's minds. Berry (1980) addresses the notion of acculturation as the change of cultural attitudes, social identity, and behaviors due to intercultural contact. He concluded that identity shift or identity conflict occur when individuals have perpetuated intercultural contact. The acculturative changes can be regarded as psychological and emotional responses in the process of cultural integration or assimilation.

International sojourn is a rewarding cross-cultural adventure. It provides individuals with a chance to develop new intercultural contact and cultural identities. Identity conflict can be a significant part of the international sojourner experience. The person who lives abroad will have to experience the adjustment process, including communication skills, core values, social distance, etc. As one lives in a new society, he/she may

identify with the new culture, which may cause many changes in one's previous identity (Bonomi et al., 2021; Mooradian, 2004). Gaw (2000) indicates that sojourners may identify themselves as people who bear components of both cultures. Sussman (2000) claims that contact with the new culture may strengthen home cultural identity and the new culture can be identified as a separated identity corresponding to the home culture. Given the rising number of international academic sojourners across the world, it is of urgent need to understand sojourners' acculturation experiences. In Boulder, Colorado, the United States, there are more than 1,000 new students and visiting scholars coming every academic year. A majority of them are from the People's Republic of China. The academic sojourners face a lot of often-encountered difficulties including insufficient language skills, academic challenges, loneliness, racial discrimination, financial pressure, and so forth. In an attempt to better support those sojourners, the current research was conducted to identify the problems with adjustment and transitional processes and provide insights into intercultural interactions.

The acculturation theorists address the attitudinal and behavior changes as a result of the sojourner experience (Hirsh & Kang, 2015; Mooradian, 2004). Newcomers inevitably develop new cultural identities as they participate in various activities with a new cultural group. The process through which sojourners form new social identities in cultural environments is essential because they can give sojourners new self-categories, as well as values, attitudes, and behaviors maintained with those identities (Kashima & Loh, 2006). That is to say, new cultural identities

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need to be developed in order to forge sojourners' lives in the new society.

Living in a new cultural environment and developing a shared cultural identity in transition times may cause problems. One of the identity-related problems that Baumeister (1986) postulates is identity conflict. The conflicted person encounters problems while accommodating different cultural components, which is a significant part of the sojourner experience. While a great deal of research is conducted on cultural adaptation and acculturation, debate on developing new cultural identity and maintaining heritage culture identity has remained unchanged. Ward (1996) poses a problem to whether having multiple referent groups would be necessary to study identity conflict and whether shared identities are adaptive.

Baumeister (1986) posits that there are two identity-related problems in the process of cultural adaptation: identity deficits and identity conflicts. Identity deficits occur when a person cannot maintain old commitments or establish new commitments to personal goals and attitudes. Identity conflicts refer to the situation when individual has difficulties in re-establishing new shared cultural attitudes due to the influence of conflicted cultural elements (Baumeister, 1986). Leong and Ward (2000) suggest that one needs to be exposed to two distinct cultural environments in order to experience the identity conflicts. Singelis (1994) proposes that identity conflict can be seen as the conflict between two individuals who each has unique sets of cultural components. This intrapersonal conflict reveals that people tend to show their weakness of identity under the situation of cultural crisis, according to Melucci (1996). This poses problems and challenges in the process of cultural adaptation that sojourners may have difficulties in self-categorization or have conflicted identities.

Baumeister (1986) demonstrates that identity conflict occurs in two situations: (1) multiple identity components require conflicting behaviors to accomplish and (2) new cultural environments require one to incorporate new cultural components which are conflicting to the existing culture. According to him, the conflict that a majority of sojourners experience belongs to the latter. Sojourners in a foreign country are confronted with making cultural transitions in which they are expected to accept new cultural norms and behaviors of the host culture. If the normative attitudes and behaviors of the host country are incompatible with those of their home culture, identity conflict may happen. Sojourners who have a strong sense of belonging to their home culture may find it very difficult to integrate new sets of cultural components into their minds. Therefore, identity conflict ensues.

Informed by Berry's (1980) identity model, Leong and Ward (2000) explored the identity conflict of sojourners in Singapore

and identified an array of predictors of identity conflict in the process of acculturation. Their findings featured the following variables including the tolerance of ambiguity, acculturation, quantity and quality of contact with host and co-nationals, perceived discrimination, cultural distance, and length of residence abroad (Ward et al., 2001). The variable quantity and quality of contact with host and co-nationals was changed into quality of contact with host and co-nationals because avoiding including two different features (quantity and quality) in one variable is necessary.

The purpose of this research is to investigate the identity conflict of Chinese academic sojourners in Boulder, Colorado, and to interpret their acculturative behaviors and attitudes, acculturative adaptation and stress, etc. This study is explicitly guided by Mooradian's (2004) model of identity conflict and Baumeister's (1986) predictive model. Specifically, participants' identity conflicts were measured by Kashima and Loh's (2006) model and Singelis's (1994) predictive model. A representation of the conceptual model is shown in Figure 1 below.

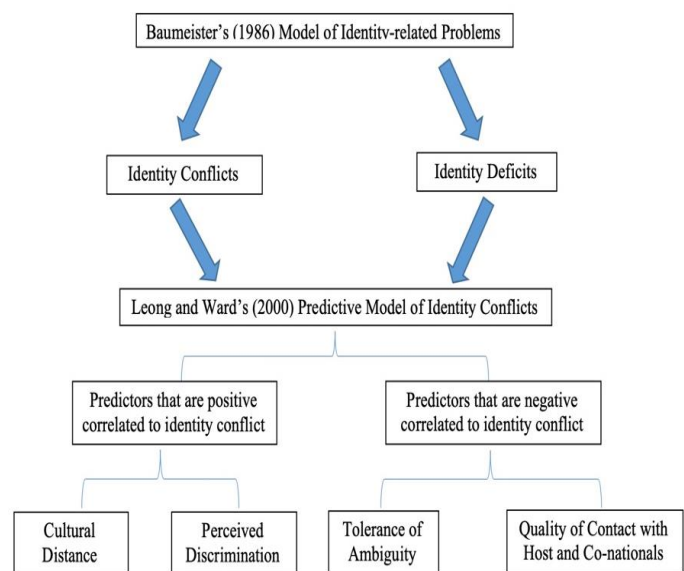


Figure 1. Conceptual Model of the Investigation.

Literature Review and Conceptual Framework

Tolerance of Ambiguity

Research shows that tolerance of ambiguity is identified as one of the key elements of a successful sojourner (Brislin et al., 1986). As indicated by Brislin (1981), tolerance of ambiguity should be considered as one of the most important determinants of cultural adaptation because a tolerant person is more likely to accept different perspectives and appreciate different opinions.

In other words, the higher level of tolerance of ambiguity a person has, the less likely this person will experience identity conflict (Berry, 1980; Rabinovich & Morton, 2016).

Quality of Contact with Host and Co-nationals.

Torbiorn (1982) contends that sojourners who have more interaction with people from both host culture and home culture are more likely to appreciate new cultural values and behaviors, and incorporate these new cultural norms into their own cultural identities. This cultural interaction provides sojourners opportunities to learn new social skills and get support from members of the host country if necessary (Ward, 1996; Ward & Kennedy, 1993). The degree of satisfaction with the intercultural relationship has a positive effect on cultural adaptation of sojourners (Searle & Ward, 1990).

Perceived Discrimination

Leong and Ward (2000) indicate that sojourners may have some negative experiences in cultural transition times, such as perceived discrimination. Lalonde et al. (1992) demonstrate that perceived discrimination has a negative impact for sojourners to develop new social norms. The correlation between perceived discrimination and identity conflict should be positive. In other words, the more the perceived discrimination, the more identity conflict a sojourner has.

Cultural Distance

As stated by Leong and Ward (2000), “cultural distance refers to the subjective perception of differences between the home and host cultures” (p. 766). The home and host cultures possess different sets of cultural components that may be contradicting to one another in some cases. As such, a positive correlation between cultural distance and identity conflict could be expected.

We find Baumeister’s (1986) predictive model of identity conflict to be very comprehensive. It can be used to measure the identity conflict of Chinese academic sojourners in Boulder, Colorado. We would keep all the variables except the variable acculturation because it seems to be very broad and vague. We expect the variables tolerance of ambiguity and quality of contact with host and co-nationals to be associated with identity conflict negatively. The variables cultural distance and perceived discrimination should be correlated with identity conflict positively.

Consutrect Map

The construct that we are measuring is Chinese academic

sojourners’ identity conflicts in their cultural transition times. More specifically, we are looking at the identity conflicts of Chinese graduate students, postdoctoral fellows, and visiting scholars in Boulder, Colorado. By identity conflicts, we mean to interpret their acculturative behaviors and attitudes, acculturative adaptation, and so forth.

The final construct map describes four levels so as to match the list of 4-point Likert-scale response categories (Table 1). The characteristics of respondents in each level are addressed in terms of four elements: the extent to which the respondent understands American social norms and incorporates new cultural components, the extent to which the respondent perceives discrimination, the extent to which the respondent is able to handle ambiguous situations, and the extent to which the respondent is satisfied with his/her contact with the people in Boulder. These four elements correspond to the four variables according to which the survey items are designed.

A respondent at the highest level of our construct is described as having big problems understanding American social norms and incorporating new cultural components into their personal identities. The home and host cultures possess different sets of cultural components that are contradicting to one another. Cultural distance is addressed in this part of our construct. This element is addressed in the following levels by using different descriptors to indicate a decreasing level of cultural distance a respondent claims to experience.

A respondent at the next level of our construct is described as having negative experiences in cultural transition times. Those negative experiences have a negative impact for sojourners to develop new social norms. Perceived discrimination is addressed in this part of the construct. This element is also addressed in the following levels by using different descriptors to indicate a decreasing level of perceived discrimination a respondent claims to experience.

The next two elements of our construct address tolerance of ambiguity and quality of contact with host and co-nationals. A respondent at these two levels of our construct is described as having problems handling ambiguous situations and dealing with intrapersonal relationships. An intolerant person is less likely to accept different perspectives and appreciate different opinions. A respondent who is unsatisfied with his/her interaction with people from both host culture and home culture are less likely to appreciate new cultural values and behaviors, and incorporate these new cultural norms into their own cultural identities. These variables are also addressed in the following levels by using different descriptors to indicate a decreasing level of ambiguity and contact a respondent claim to experience.

Table 1

Construct Map of Identity Conflicts

Level	Respondent Characteristics
4 Big identity conflicts	<p>Sojourners have no understanding of the American culture and have big problems incorporating new cultural components into their identities.</p> <p>Sojourners have very negative experiences in cultural transition times.</p> <p>Sojourners have big problems handling ambiguous situations.</p> <p>Sojourners are very unsatisfied with their interaction with people from their home and host culture.</p>
3 Moderate identity conflicts	<p>Sojourners have some understanding of the American culture and have some problems incorporating new cultural components into their identities.</p> <p>Sojourners have some negative experiences in cultural transition times.</p> <p>Sojourners have some problems handling ambiguous situations.</p> <p>Sojourners are unsatisfied with their interaction with people from their home and host culture.</p>
2 A little identity conflict	<p>Sojourners have a reasonably good understanding of the American culture and have a little problem incorporating new cultural components into their identities.</p> <p>Sojourners have a few negative experiences in cultural transition times.</p> <p>Sojourners have a little problem handling ambiguous situations.</p> <p>Sojourners are a little unsatisfied with their interaction with people from their home and host culture.</p>
1 Little identity conflict	<p>Sojourners have an excellent understanding of the American culture and have little problems incorporating new cultural components into their identities.</p> <p>Sojourners have very few negative experiences in cultural transition times.</p> <p>Sojourners have little problem handling ambiguous situations.</p> <p>Sojourners are satisfied with their interaction with people from their home and host culture.</p>

Methodology

Description of Target Population, Sampling Frame, Sample Selection Process

The sample comprises of 40 Chinese academic sojourners (graduate students, postdoctoral fellows, and visiting scholars) at the University of Colorado Boulder (CU Boulder), National Center for Atmospheric Research (NCAR), and National Oceanic and Atmospheric Administration (NOAA). Their ages vary from 24 to 35 years old. All participants identify themselves as Chinese and had stayed in Boulder for more than two years so that they were sufficiently exposed to the new culture. Utilizing the stratified sampling method, an efficient statistical estimate of each group of academic sojourners were observed.

The proportions of each sub-group of the target population are presented in Table 2. Twenty graduate student participants were

from CU Boulder. Among them, there were ten Master's students and ten doctoral students from ten departments: Chemistry, Physics, Biology, Engineering, Computer Science, History, Economics, Linguistics, Communication, and Atmospheric and Oceanic Sciences. One Master's student and one doctoral student were chosen from each department. The international scholar statistics for the three organizations (CU Boulder, NOAA, and NCAR) put postdoctoral fellows and visiting scholars into one category. Since most of the postdoctoral fellows received their doctorate in China and temporarily work in America, the nature of their job is similar to that of the visiting scholars. In this investigation, postdoctoral fellows and visiting scholars were considered as one type of academic sojourners. There were eight postdoctoral fellows and visiting scholars from CU Boulder, six from NOAA, and six from NCAR.

Table 2
Stratified Sampling

Types of Academic Sojourner	Number in Sample	Proportion in Sample	Proportion in Population	Weight	Weighted Sample
Master student–CU	10	25%	27%	$27/25 = 1.08$	11
Doctoral student–CU	10	25%	28%	$28/25 = 1.12$	11
Postdoctoral fellow and visiting scholar–CU	8	20%	27%	$27/20 = 1.35$	11
Postdoctoral fellow and visiting scholar–NOAA	6	15%	8%	$8/15 = 0.53$	3
Postdoctoral fellow and visiting scholar–NCAR	6	15%	10%	$10/15 = 0.67$	4

Item Design

Berry (1980) integrated existing instruments from different publications to measure the variables of perceived discrimination and tolerance of ambiguity. New instruments were developed to measure the rest of the variables. In this investigation, we modified the instruments that are used to measure the variable tolerance of ambiguity to make the items more applicable to our target population and cultural environments. We also created new instruments to measure the rest of the variables: perceived discrimination, cultural distance, and quality of contact with host and co-nationals.

The questionnaire consists of 40 items, 10 items for each variable. Following the feedback from an expert in the field, we rewrote most of the items in the first three sections and refined a few items in the last section. To ensure clear and accurate expression and understanding, all the items were provided in Chinese. Those items that are double-barreled were either eliminated or revised. One of our panel members who is bilingual in English and Chinese helped us check the language accuracy. We also changed the rating scale into four in order to match our construct map.

Item Template

- Tolerance of ambiguity. McLain's (1993) 22-item scale was adapted to serve as a foundation. We eliminated the items that are not applicable to our target population and context, keeping and modifying ten items. Participants responded to each item on a four-point Likert scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate a stronger tolerance of ambiguity.

- Perceived discrimination. Ten items were created to measure whether participants are discriminated against by professors,

colleagues, or administrators. Participants were asked to rate each statement on a four-point Likert scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate a stronger sense of perceived discrimination.

- Cultural distance. This subscale contains ten items assessing the extent to which sojourners' life experiences differ from their experiences in home country. The items pertained to self-categorization, language, food, entertainment, and so forth. Responses were also rated on a four-point Likert scale. Higher scores indicate bigger cultural distance.

- Quality of contact with host and co-nationals. Four items were created to measure the quantity of contact with Americans, along with six items assessing sojourners' satisfaction with their relationships with Americans and Chinese. A four-point Likert scale from 1 (strongly disagree) to 4 (strongly agree) was adopted. Higher scores indicate more and higher quality of contact with the host or co-nationals.

The four-point Likert scale directly related to the four levels of the construct. The items were grouped into four sections based on the four variables in Leong and Ward's (2000) predictive model. It was our hypothesis that the items that were created to measure perceived discrimination and cultural distance would be more difficult.

Item Scoring

Our outcome space was consistent to our construct map. In our instrument, the respondents were scored as having bigger or smaller identity conflicts in four levels (Table 3). For sections cultural distance and perceived discrimination (section two and section three), responses demonstrating strongly disagree with understanding new culture and being discriminated were scored 1; responses demonstrating disagree with understanding new

culture and being discriminated were scored 2; responses demonstrating agree were scored 3; responses demonstrating strongly agree were scored 4. Reverse-score is needed for section one and section four since they are negatively correlated to identity conflicts. Responses demonstrating strongly agree were scored 1; responses demonstrating agree were scored 2; responses demonstrating disagree were scored 3; responses demonstrating strongly disagree were scored 4. The scores were collapsed to dichotomous scoring. Responses 1 and 2 were collapsed to 0; responses 3 and 4 were collapsed into 1.

Our hypothesis was that a majority of our respondents should be placed in level 1 or 2 of the construct, with total scores lower than 20. The visiting scholars are more likely to have identity conflicts and should be placed in level 2 or 3 of the construct map. The doctoral students and master students should be placed in level 1 or 2. We do not expect that any respondents are placed in level 4.

Table 3
Relationships Between Levels of Identity Conflicts and Total Scores

Levels of Identity Conflicts	Total Scores
4	30–40
3	20–30
2	10–20
1	1–10

Pilot Test

The pilot test for our identity conflicts survey was administered to a sample of 40 Chinese academic sojourners from three organizations in Boulder area: CU Boulder, NOAA, and NCAR. Participants were given a description of the investigation and a consent form to make sure that their participation of this study was completely voluntary. No missing responses were identified in the dataset.

Analysis

After administering our survey instrument to our sample population and receiving all the responses, we created a data set including all the participants’ responses in the Excel spreadsheet. We need to use methodologies from both Classical Test Theory and Item Response Theory to do our analyses.

Classical Item Analysis

Classical test theory (CTT) has been recognized as the

foundation for test measurement theory, which describes a series of analyzing procedures used to recognize item difficulty and discrimination and develop the reliability of tests. A high positive item-total correlation means that the item is discriminating high-performance respondents and low-performance respondents. Whereas a low negative item-total correlation means that the item is not discriminating the two groups and low-performance respondents are more likely to answer this item correctly.

We ran classical item statistics in RStudio by using the data set generated from the identity conflicts survey in which a total of 40 items were included and half of them were reverse-scored. Table 4 shows the classical item statistics of item-total correlation (with and without item) and item difficulty (p-value). The item-total correlations range from -0.11 (CD11) to 0.59 (CD20 and PD26). The higher the item-total correlation, the more reliable the item is correlated to other items on this assessment. For example, participants who responded “disagree” on a certain item would answer “disagree” on other items.

Table 4
Classical Item Statistics

Item	Item Total Correlation	Item Total Correlation without Item	Difficulty (P-value)
C1	0.17	0.09	0.225
C2	0.13	0.07	0.125
C3	0.44	0.37	0.2
C4	0.05	-0.03	0.175
C5	0.55	0.48	0.65
C6	0.27	0.20	0.175
C7	0.43	0.34	0.45
C8	0.44	0.39	0.1
C9	0.19	0.12	0.15
C10	0.07	0.02	0.05
CD11	-0.11	-0.19	0.275
CD12	0.35	0.28	0.175
CD13	-0.12	-0.21	0.4
CD14	0.53	0.46	0.35
CD15	0.27	0.21	0.15
CD16	0.22	0.13	0.625
CD17	0.43	0.34	0.475
CD18	0.40	0.31	0.475
CD19	0.44	0.36	0.6
CD20	0.59	0.52	0.325
PD21	0.26	0.16	0.525
PD22	0.16	0.10	0.125
PD23	0.38	0.30	0.6
PD24	0.13	0.09	0.05

PD25	0.40	0.33	0.175
PD26	0.59	0.53	0.275
PD27	0.49	0.45	0.075
PD28	0.49	0.45	0.075
PD29	0.06	0.03	0.025
PD30	0.36	0.31	0.075
TA31	0.27	0.19	0.25
TA32	0.52	0.47	0.15
TA33	0.45	0.39	0.175
TA34	0.46	0.37	0.525
TA35	0.42	0.33	0.45
TA36	0.30	0.21	0.65
TA37	0.10	0.04	0.125
TA38	0.27	0.19	0.25
TA39	0.39	0.34	0.1
TA40	0.11	0.03	0.225

Note. Cronbach’s Alpha: 0.76

For this data set, the item-total correlations for all items are higher than the correlation total when items are removed. The sample mean and standard deviation for the item-total correlation without item are 0.24 and 0.19, respectively (Table 5). Generally, we would say that the item-total correlations for our data set are not very good. The item-total correlations for some of the items are higher than 0.5 (e.g., C5, CD14, CD20, PD26). However, a majority of the item-total correlations are various and quite low. The standard deviation is relatively big. It means that participants who “disagree” with a certain item would not “disagree” with the other items. With the items removed from the correlation total, almost all the items become less discriminating. Figure 2 is a visual representation of the item-total correlation when items are removed.

Item difficulty refers to the proportion of participants who responded the item correctly. It is also called p-value. If an item has either a very high or very low p-value, it is very likely that this item is not discriminating. For example, if the item’s p-value is greater than 0.9 or lower than 0.1, this item can be interpreted as being too hard or too easy for almost the entire participants and not providing much discrimination between high-performance and low-performance respondents.

Table 5

Sample Mean and Standard Deviation

	Difficulty	Item-total Correlation WOI
Mean	0.28	0.24
Standard Deviation	0.19	0.19

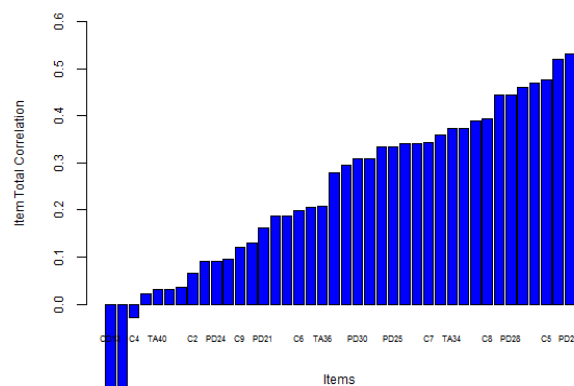


Figure 2. Item Total Correlation Without Item.

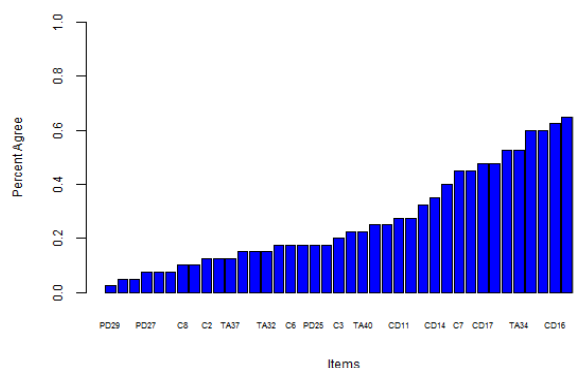


Figure 3. Item Difficulty.

The p-values for our data set are quite low, which indicates this survey is not discriminating between high-performance and low-performance respondents. The items in the section of perceived discrimination have p-values lower than 0.1. We expected to have difficult items in the sections of cultural distance and perceived discrimination, since they are placed higher in our construct. Four items in the section of cultural distance and three items in the section of tolerance of ambiguity have p-values higher than 0.45. Figure 3 is a visual representation of the item difficulty for our identity conflicts survey.

The Cronbach’s Alpha aims to measure the internal consistency of a test or scale. Numeric Alpha is between 0 and 1. Internal reliability is the extent to which the item within a test is consistent in terms of the constructs. For instance, if a test contains 20 items, we split the 20 items into two and give them to two students. If the two students receive similar scores, this test has internal reliability. The Cronbach’s Alpha for the items on this survey is 0.76, which means that this test is internally reliable.

Figure 4 is a visual representation of the relationship between item-total correlation and item difficulty. Those items have higher levels of difficulty tend to have higher item-total correlation. Items whose difficulties are between 0.3 and 0.4 have either highest item-total correlations or lowest item-total correlations.

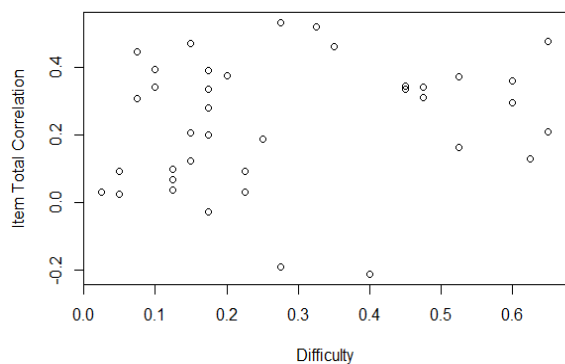


Figure 4. Scatter plot of the relationship between item-total correlation and item difficulty.

Figure 5 is a visual representation of participants' responses: 0 for disagree and 1 for agree. This figure shows that participants found it easier to disagree with five of the items in the section of perceived discrimination (PD29, PD24, PD 27, PD28, and PD30). Since the variable perceived discrimination is placed higher in our construct, it is a good indication that participants do not have very negative experiences. One item in the section of perceived discrimination (PD40) have a low percentage of participants to disagree. The items in the section of cultural distance tend to have more participants to agree with. That is an indication that the culture difference between China and America sometimes does bother our participants.

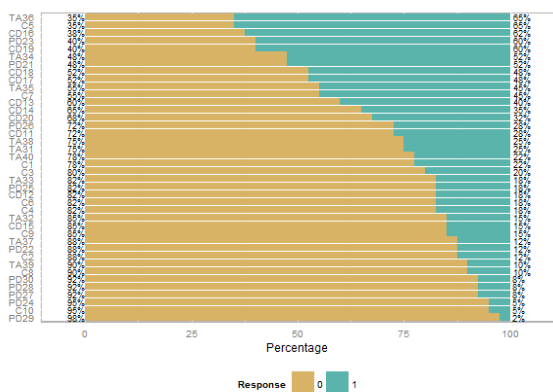


Figure 5. Likert-Style.

Table 6

Statistics for the Total Score

Minimum	Maximum	Mean	Median	Standard Deviation
0.00	22.00	11.05	10.00	5.10

Table 6 shows the descriptive statistics of the total score. The mean score is 11.05; the maximum score is 22; the minimum score is 0. The standard deviation is 5.1, which is relatively high.

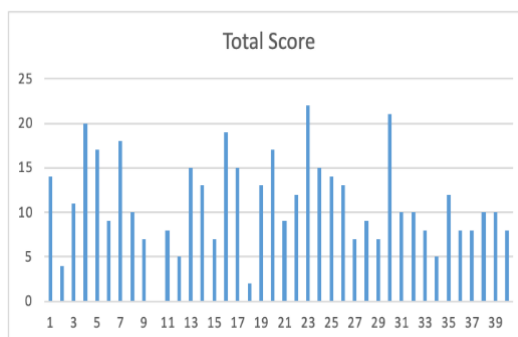


Figure 6. Total Score.

As Figure 6 shows, only two participants scored higher than 20. Seven participants scored higher than 15. The rest of the 31 participants scored lower than 15. This is exactly what we are expecting that a majority of the participants get lower scores and are placed in level 1 or level 2 in the construct.

Item Response Model

After completing the classical test analyses, we applied the Rasch Model to analyze categorical data. In the Rasch model, the answers to the items are scored either 0 or 1 (two ordered categories) to present increasing levels of an answer on predicting variables, such as teachers' income or students' academic achievement. These answers for all the items are added to assign each participant a total score. The total score summarizes the answers for all the items. A participant who gets a higher total score than another participant is recognized to show more characteristics of the assessed variable. Below is a mathematical form of the Rasch model for categorical data:

$$P(X_{pi} = 1 | \theta_p, b_i) = \frac{\exp(\theta_p - b_i)}{1 + \exp(\theta_p - b_i)}$$

The model tells us that a participant's probability of having identity conflicts depends on the person's ability of incorporating new cultural components (θ_p), and the difficulty of the item (b_i). In the case of a dichotomous item, $P(X = 1 | \theta_p, b_i)$ is the probability of success on interaction between the

participant and item. The log odds (logit) of a correct answer to an item by a participant should be equal to θ_p , minus b_i .

In the Rasch model, the probability of a correct answer is modeled as an interaction of the person parameter and item parameter. In this investigation, item parameters represent the difficulty of items, whereas person parameters represent the ability level of participant who are assessed. The higher a participant's ability to the item difficulty, the higher probability of a correct answer to the item. When a participant's place on the latent trait is equal to the item difficulty, there is a 50 percent change of a correct answer in the Rasch model.

To get estimates for the item parameter and person parameter, we ran the analyses in RStudio. R gave us two parameterizations: item difficulty and item easiness. The first item is restrained to have item difficulty equal to that negative sum of all other item parameter estimates so that average item difficulty equals to 0. The item difficulty parameters vary from -2.008 to 1.859 ; the standard errors are relatively huge.

If the model fits, item parameters should be invariant over samples of participants from the target population for whom the test is intended. If the model fits, person parameters should be invariant over samples of test items from the population of items measuring the ability of interest. The items that do not fit the Rasch model are multidimensional. The items that fit the Rasch model are likely to measure one single dimension in the construct map. Big differences in the value of item parameters indicate model misfit. In this case, we may conclude that the model does not fit due to the multi-dimensionality of identity conflicts.

The outfit and infit statistics for each item, and the corresponding t-statistics were calculated. Only a few of them are statistically significant. Quite a number of items have MNSQ values above or below 1. The infit mean square (MNSQ) values vary from 0.792 (PD26) to 1.471 (CD13). It is observed that 38 out of 40 items fall within an acceptable range (0.75 to 1.33). The infit MNSQ for rest of the two items are only a little bit higher (1.344 and 1.471).

Item or Category Characteristics Curve Plots

The item characteristic curve (ICC) examines the relationship between the test score and participant location estimate. The ICC shows the probability of a correct answer as a function of the participant's ability (theta). Figure 7 shows ICCs for 40 items in identity conflicts survey. The leftmost ICCs in figure 7 are the easiest items, whereas the rightmost ICCs in figure 7 are the most difficulty items. It seems that the items for identity conflicts survey appear to be too easy for the participants.

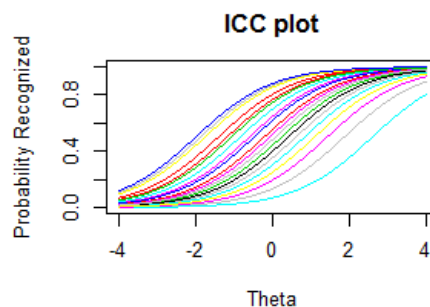


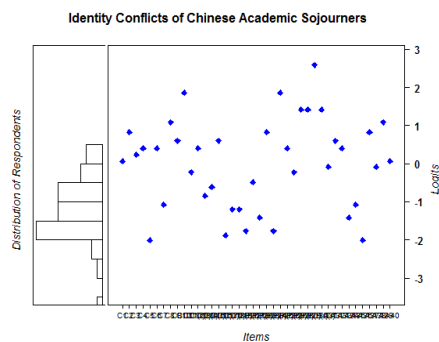
Figure 7. ICCs for 40 Items in Identity Conflicts Survey.

Individual Analysis

Participants' raw scores, ability estimates, standard errors, outfit statistics and infit statistics, and the corresponding t-statistics for identity conflict survey were assessed. Students' ability estimates vary from -3.511 to 0.270 . The infit statistics for the majority of participant fell between 0.7 and 1.3, with one participant below 0.7 and one participant above 1.3. Participant 39 was flagged for negative misfit and participant 9 was flagged for positive misfit.

Wright map

Wright maps show the location of both participants and items on the same scale and are often used to present the results of dichotomous item response model. We ran the Wright Map package in RStudio. Figure 8 shows the Wright Map for the identity conflicts survey. We need to look at to what extent, the dot covers the distribution on the left? We would say around ten dots are not covered by the distribution on the left (Figure 8 and Figure 9), which indicate that the person ability estimates and item parameters are not a good match in this investigation.



Mean theta = -1.25 ; SD = 0.41

Figure 8. Graphical Wright Map for Identity Conflict Survey.

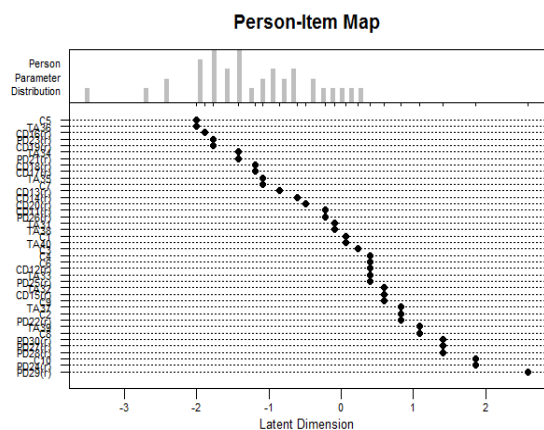


Figure 9. Wright Map for Identity Conflict Survey.

Conclusions

Reliability

Reliability is the extent to which a test, measurement, or experiment tends to show the same results or test scores for each occurrence (McLain, 1993). A test which is said to be reliable if the test scores are consistent all the time. Reliability is measured through the performance of the test taker and the item difficulty.

The model states that a participant's probability of having identity conflicts on the survey depends on where they fall on the construct map with their ability in theta and the item difficulty. We have reported the person and item estimates in the classical item analysis section. The mean theta for this survey is -1.25 . With a theta value less than 0, it is an indication that less than half of the participants are having identity conflicts.

Validity

Validity is the extent to which evidence and theory support the interpretations of test scores (Ward, 1996). In order to corroborate the validity of this survey, an array of steps needed to be done in the future.

Rasch measurement is concerned with linear measures along unidimensional constructs. In our study, identity conflict is a broad idea, which is multidimensional. What we need to do is to narrow down the concept of identity conflict and focus on one of the two variables that are highly relevant in our construct: cultural distance and perceived discrimination. The other two variables would be dropped. These two issues are of great significance in cultural transition times, and they are the main reasons that cause identity conflicts.

After reaching linear measures along unidimensional constructs, we need to eliminate those items that are not relevant

and create more items that measure the new construct. The expectation is to keep no more than 25 items to measure our new construct after several rounds of item revision. Feedback from panel members will also be taken into consideration during the process. For the categorical responses, we expect to keep the four-point Likert scale.

Specifically, future studies would be directed towards Chinese graduate students at the University of Colorado Boulder. Participants will be selected from different departments to achieve heterogeneity. We would hope to have 40 participants and avoid including more than seven participants from one department.

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