



Coping with perceived discrimination: A longitudinal study of sojourners in China

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Abstract

The current research examines cross-cultural adaptation of sojourners by focusing on an understudied population – international students in China – and how they coped with perceived discrimination. It had two overall aims: 1) to test whether secondary coping would be effective in reducing the negative effects of perceived discrimination, based on research on cultural fit and goodness of fit; 2) to further explore the moderating role of host culture orientation in the effectiveness of secondary coping. A 90-day longitudinal study was conducted on first- and second-year international students in China ($N = 130$) via questionnaires assessing perceived discrimination, coping strategies (primary and secondary coping), and adaptation outcomes (sociocultural adaptation, psychological adaptation, and perceived stress). As expected, for sociocultural adaptation over time, a three-way interaction was found (host orientation \times perceived discrimination \times secondary coping). Low levels of secondary coping and high host orientation exacerbated the negative effects of perceived discrimination. No three-way interaction was found regarding psychological adaptation or perceived stress over time; instead, there were significant two-way interactions between coping and perceived discrimination. High levels of secondary coping reduced the negative effects of perceived discrimination on perceived stress over time, whereas high levels of primary coping buffered the negative effects on psychological adaptation over time. As a whole, we found some evidence supportive of both cultural fit and goodness of fit as well as contradictory evidence. We provide possible explanations for the contradictory findings and discuss the limitations of this study and the complexity of effective coping during sojourner adaptation.

Keywords Acculturation · Cultural fit · Acculturation orientation · Longitudinal research design · Perceived discrimination · Primary and secondary coping · Psychological adaptation · Sociocultural adaptation

International student enrollment in China has tripled over the last decade, and it is now the third top study abroad destination in the world, with over 400,000 international students (Wen et al. 2017). While Asian nations, including South Korea, Japan, and Thailand, are the main source of international students in China, the United States, Europe, and Africa also send thousands of students every year (English et al. 2016). The challenges that result from the cultural transitions facing these

academically motivated sojourners are widely known to lead to stress, which requires coping in order to achieve adaptation over time (Berry 1997; Ward and Geeraert 2016). As the tide of international education is shifting toward Asian countries such as China, there is an increasing need to understand sojourner adjustment in Asian cultural contexts, especially with regard to stress and coping (Kuo 2014).

Various coping strategies have been shown to reduce the negative impacts of acculturative stress on adaptation outcomes (Aldwin 2007). The shift in the countries hosting international students has given rise to this important question: does the efficacy of coping strategies depend on the cultural context in which they are employed? To that end, this study focuses on the adaptation of international students in China, a growing yet understudied population. In addition, while acculturative stress can stem from a wide range of difficulties such as language barriers, homesickness, cultural differences, and financial stress, we examine coping response to a specific type of stressor: perceived discrimination. Experiencing discrimination can be difficult for foreigners who look, speak, or

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behave differently from Han Chinese people, who account for approximately 92% of the Chinese population. The overall objective of this research is to examine whether the use of secondary coping helps mitigate the negative effects of perceived discrimination over time. We further test whether or not the proposed ameliorative effect of secondary coping might be moderated by orientation toward the host Chinese culture.

Efficacy of Coping Strategies: Cultural Fit

Coping is defined as the conscious effort to regulate one's emotional, cognitive, behavioral, and physiological responses to stressful events or circumstances (Compas et al. 2001). Literature regarding coping distinguishes two general coping strategies that are relevant to cross-cultural adaptation studies: primary vs. secondary coping (Rothbaum et al. 1982; Ward 2004). Primary coping is characterized by active attempts to remove the stressor or change features of the environment in order to align with one's needs. It is aimed at influencing or taking control of the environment and is typically accomplished via problem-solving strategies. Secondary coping, on the other hand, involves a fit-focused approach, where the individual attempts to adjust to the stressor with the aim of creating harmony between the self and the environment (Morling and Evered 2006). In contrast to primary coping, secondary coping involves the use of inward-directed, self-focused strategies, such as cognitive restructuring and acceptance.

Pertinent to the coping research is cross-cultural variation in the utilization and effectiveness of primary and secondary coping (Rothbaum et al. 2011). Western cultures tend to emphasize individualistic ways of coping (Noh et al. 1999), and research suggests that people in Western societies prefer primary coping strategies (McCarty et al. 1999; Kuo 2013). In contrast, coping literature suggests that people in Asian cultures might rely on secondary coping to a greater extent than in other cultures (Spector et al. 2004; Trommsdorff and Essau 1998; Persike and Seiffge-Krenke 2016). Asian cultures tend to be more collectivistic; people are embedded within a community and construe themselves as interdependent members who utilize appropriate behaviors to properly fit in to the social context (Markus and Kitayama 1991). East Asian values and belief systems (e.g. Buddhism, Taoism, and Confucianism) also emphasize the idea that adjusting the self to the existing world is necessary and, therefore, tend to value strategies that promote interpersonal harmony (Chang et al. 1997). Thus, the cultural context matters in determining if a coping strategy will be effective or ineffective in reducing or eliminating stress.

Consistent with empirical findings, the Cultural and Contextual Model of Coping defines the coping process as

the result of the interaction between the individual and the environment, including the sociocultural context (Heppner et al. 2014). This model was supported by recent evidence of the effectiveness of culturally congruent coping, Szabo and colleagues (Szabo et al. 2017) conducted a longitudinal study that examined whether secondary coping mitigated the negative effects of acculturative stress among international students in China and New Zealand. It was found that secondary coping exacerbated the negative effects of acculturative stress among both Asian and Western international students in New Zealand. In contrast, for similar groups of Asians and Westerners in China, secondary coping buffered the negative impact of acculturative stress. In other words, secondary coping represents a culturally congruent coping strategy within the collectivistic, Chinese context and is hence adaptive, whereas it results in a cultural mismatch in the individualistic New Zealand context (see also, Wang et al. 2012).

Efficacy of Coping Strategies: Goodness of Fit

In addition to cultural fit in coping, another determinant of coping effectiveness is the nature of the stressor itself. Not all stressors are created equal. One way in which stressors vary is controllability. There are several common, yet relatively controllable stressors for which direct actions can be taken to reduce or eliminate their negative effects. For example, acculturative stress that results from language difficulty can be mitigated by attending language classes and practicing with language partners. Other aspects of acculturative stress, however, may be relatively uncontrollable. An important postulate of the transactional model of stress and coping (Lazarus and Folkman 1984) is that primary (problem-focused) coping is more effective in high-control situations, whereas secondary coping (emotion-focused) is more effective in low-control situations. This is known as the goodness of fit hypothesis and has received considerable empirical support (Macrodimitris and Endler 2001; Park et al. 2012; Vitaliano et al. 1990; Zakowski et al. 2001). In other words, the fit between one's appraisal of a stress-inducing situation and one's deployment of a coping strategy also predicts how well one adapts to a new cultural environment (Ward 2004).

There is some empirical evidence to support the compatibility of the coping strategy and the controllability of stressor (Park et al. 2001; Zakowski et al. 2001). Moreover, when individuals actively respond (primary coping) to circumstances they can control, there is generally favorable support of positive outcomes (Aldwin 2007). For example, in a study of college students and their controllability with daily stressors, researchers found primary strategies predicted positive adjustment under conditions of high, rather than low, controllability (Park et al. 2004). Yet when individuals appraise little to no control, other coping strategies are helpful.

For example, one study examining the uncontrollability of stressor found that for American teens at a summer camp who experienced homesickness, secondary coping was an effective strategy reducing the feeling of being away from home (Thurber and Weisz 1997).

In acculturation research, there is some supporting evidence for the goodness of fit hypothesis. In an intra-cultural adaptation study, Chinese freshmen who utilized high levels of primary coping for managing the stress of relocating from their hometowns to attend university (uprooting stress) reported more anxiety later in that semester (English et al. 2017). That is, this lack of goodness of fit between primary coping and the uncontrollability of uprooting stress led to more anxiety later. The most comprehensive study that dealt with goodness of fit in an acculturation context was conducted by Szabo and colleagues (Szabo et al. 2016). Secondary coping reduced, while primary coping exacerbated, the negative effects of uprooting stress over time for international students in New Zealand (Szabo et al. 2016).

Overview of the Present Research: Perceived Discrimination, Secondary Coping, and the Moderating Role of Host Culture Orientation

In the present study, we focus on international students in China, and how they cope with perceived discrimination. The damaging effects of perceived discrimination on mental and physical health are well-understood in the Western cultural contexts (e.g., Pascoe and Smart Richman 2009; Romero et al. 2007), we think it is worthwhile to study how international students in China cope with it for two reasons. First, even though there is a general lack of empirical work on this topic in the Chinese context, there are reasons to believe that foreigners do encounter discrimination. Given the relatively homogenous population (92% Han Chinese), it is common for local Chinese to behave in ways that may be interpreted as discriminatory by foreigners (e.g., calling them by names, pointing, or staring) as most Chinese have rarely interacted with foreigners from other countries (Chiang 2015). Some foreigners may report more salient discrimination due to both their racial visibility and perceived social status. For example, some Africans reported experiencing racial profiling by customs officials as being “an unconscious ethnic minority profile of African travelers” (Bodomo 2015). Even culturally similar Asian groups (e.g., Koreans and Japanese) and other non-Mainland Chinese groups (e.g., Taiwanese, Singaporean Chinese, and Chinese American) may encounter discrimination because of the expectation to fit in (Selmer and Shiu 1999) or historical envy or resentment (Björkman and Schapp 1994). Given that newcomers to China have little control over the host cultural context, we therefore

expected secondary coping to ameliorate the negative effects of perceived discrimination not only because secondary coping is more congruent with the normative Chinese culture, but also because of its goodness of fit with the uncontrollable nature of perceived discrimination.

A primary goal of this study was to test whether secondary coping would help reduce the negative effects of perceived discrimination. As reviewed above, from the perspective of cultural fit (e.g., Heppner et al. 2014), secondary coping is adaptive and malleable—it can be learned and is congruent with the normative Chinese culture. Seen through the lens of goodness of fit (e.g., Conway and Terry 1992), discrimination based on one’s nationality or race represents a largely uncontrollable type of acculturative stress, as individuals cannot fully control how they are perceived by the Han Chinese majority. Thus, secondary coping may be more appropriate due to its goodness of fit with the uncontrollable nature of perceived discrimination. In sum, both perspectives (cultural fit and goodness of fit) converge in the prediction that secondary coping would buffer the negative effects of perceived discrimination on adaptation outcomes over time.

Furthermore, this study explored the role of host cultural orientation in moderating the effectiveness of secondary coping hypothesized above. Beyond acculturative stress, newcomers face the challenge of adapting to the host culture (Schwartz et al. 2010; Ward and Geeraert 2016). Host cultural orientation refers to differences among acculturating individuals in their overall orientation towards acquiring the beliefs, practices, and values of the host culture (Berry 1997). Notably, coping with acculturative stress and acculturation orientations are often considered two distinct processes of acculturation (Ward and Geeraert 2016). We aimed to explore whether the effectiveness of secondary coping in buffering the negative effects of perceived discrimination might interact with the sojourner’s host culture orientation. From the perspective of cultural fit, the benefits of practicing culturally congruent coping may accrue only among those strongly oriented to the host culture. In contrast, adopting culturally congruent coping may be of limited value or perhaps even backfire for those who do not wish to or lack the opportunity to acquire the host culture. There is some evidence suggestive of the moderating role of host culture orientation. In a study of Korean immigrants in Canada, Noh and Kaspar (2003) found that a strong orientation to Canadian culture (i.e. high level of host culture orientation) and the use of culturally congruent coping (i.e. problem-focused coping) buffered the negative impacts of discrimination on depression. In contrast, a low level of host culture orientation combined with frequent use of problem-focused coping failed to show any buffering effect. Conceptually similar results were found in a study that focused on orientation to heritage culture and forbearance coping (a specific strategy of secondary coping) in a sample of Chinese international students (Wei et al. 2012). Thus, we

tested three-way interactions among perceived discrimination, secondary coping, and host culture orientation on adaptation outcomes over time. Significant interactions would provide unique support for the idea that the extent to which sojourners orient themselves to the host culture affects how much they can benefit from culturally congruent coping.

With respect to adaptation outcomes, we followed the distinction between psychological (feeling well) and sociocultural (doing well) outcomes of acculturation (Ward 2001; Ward and Kennedy 1996). While sociocultural adaptation is conceptualized as the acquisition of appropriate skills to navigate the new environment competently (Ward and Kennedy 1993; Van De Vijver and Phalet 2004), psychological adaptation pertains to psychological adjustment in the new culture and subjective or emotional well-being especially (Sam and Berry 2006; Searle and Ward 1990). To complement aspects of adjustment that are particularly sensitive to acculturation, we also included a global measure of stress that is typically associated with both types of adaptation (Demes and Geeraert 2015).

Method

Procedure and Design

A longitudinal study was conducted over the course of the fall semester (September, 2014) and winter (January, 2015). International students studying at a university in Eastern China completed questionnaires in their classes taught through the international college. In the first weeks of the fall semester, students were contacted through snowball sampling procedures and asked if they wanted to participate in the study. A total of 225 students agreed and completed the paper questionnaire collected at time 1 (hereafter T1). At the end of the semester (January 2015), researchers returned to the same classes to collect time 2 (hereafter T2). In total, 130 participants completed both time waves of the study, for a drop-out rate of 42%. Attrition analysis revealed no differences between the groups ($t < 1$ for all T1 variables including: age, gender, origin, living time). Since no differences were reported, participants who completed both time waves of measures ($N = 130$) were used in the analyses.

All procedures and measures were approved by the recommendations of the Institutional Review Board of the Psychology Department of the university with written informed consent from all participants. All subjects gave written informed consent in accordance with the Declaration of Helsinki.

Sample

Sojourners were categorized as coming from three general regions of the world (Southeast and Eastern Asia, $n = 77$;

Europe and North America, $n = 48$; and the Middle East and Africa; $n = 5$). A dummy variable “Asian” was created to simplify analyses (non-Asian = 53 and Asian = 77). On average, participants had lived in Eastern China for 330 days ($SD = 615$) at the time of first data collection. The average age of the sample was 23.87 years old ($SD = 4.21$) and 58% ($n = 75$) were female. 77% of participants ($n = 59$) were studying graduate degrees, 18% were studying undergraduate degrees ($n = 23$), and 23% of participants ($n = 30$) were enrolled in non-degree seeking language courses.

Measures

Perceived Discrimination at T1 Perceived discrimination, adapted from Jasinskaja-Lahti et al. (2009), used four items: “Chinese have a positive attitude towards my ethnic background,” “I have been treated fairly in China,” “I have experienced discrimination in China,” and “My ethnic background is appreciated in China.” Participants answered on a scale anchored from 1 (*strongly disagree*) to 7 (*strongly agree*). Positive items were reverse-scored to indicate higher scores representing more perceived discrimination. The four-item measure had acceptable reliability (see Table 1).

Primary and Secondary Coping at T1 Primary and secondary coping at time 1 were measured using Carver and colleagues’ (Carver et al. 1989) COPE scale with four items for each of the four coping subscales (i.e., active coping, planning, positive reinterpretation, and acceptance). Participants were asked to respond regarding how they usually dealt with problems and to indicate which strategies they were *presently using or had used within the last few weeks*. Individuals responded to statements such as “I take direct action to get around the problem” (active coping), “I make a plan of action” (planning), “I look for something good in what is happening” (positive reinterpretation), and “I accept the reality of the fact that it happened” (acceptance) on a 4-point scale anchored by 1 = *don’t do this at all* and 4 = *do this a lot*. T1 Primary coping was measured by the 8 items for active coping and planning. T1 Secondary Coping was measured by the 8 items for positive reinterpretation and acceptance.

To assess whether the four subscales would map onto primary and secondary coping, a factor analysis with principal axis factoring and oblique rotation was conducted. The results supported a two-factor structure, with explained a cumulative variance of 41%. Specifically, the first factor corresponded with primary coping (28% of the variance explained), while the second factor reflected secondary coping, which accounted for additional 13% of the variance. All items exhibited factor loadings exceeding .30. However, one positive interpretation item, “I try to grow as a person as a result of an experience,” showed similar loadings on both primary and secondary coping

Table 1 Descriptive statistics and correlations among the study variables

| | Correlations | | | | | | | | | | | Descriptive statistics | | | | | |
|---------------------------------|--------------|-------|-------|-------|--------|--------|--------|--------|-------|-----|-------|------------------------|----|--------|--------|----------|------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | M | SD | α | Inter-item correlation |
| 1. Perceived Discrimination | – | | | | | | | | | | | | | 3.02 | 1.02 | .67 | .35 |
| 2. Primary Coping | –.19* | – | | | | | | | | | | | | 3.03 | .50 | .82 | .36 |
| 3. Secondary Coping | –.17 | .40** | – | | | | | | | | | | | 3.19 | .50 | .79 | .35 |
| 4. Host Orientation | –.29** | .11 | .09 | – | | | | | | | | | | 5.03 | 1.19 | .83 | .56 |
| 5. Perceived Stress T1 | .23** | –.15 | –.19* | –.12 | – | | | | | | | | | 3.37 | .98 | .86 | .36 |
| 6. Psychological adaptation T1 | –.31** | .08 | .02 | .32** | –.62** | – | | | | | | | | 4.71 | .84 | .72 | .24 |
| 7. Cultural Distance T1 | .23** | –.04 | .02 | –.03 | .21* | –.15 | – | | | | | | | 5.07 | .91 | .82 | .38 |
| 8. Perceived Stress T2 | .28** | –.14 | –.15 | –.11 | .51** | –.42** | .20* | – | | | | | | 3.49 | 1.06 | .87 | .48 |
| 9. Psychological Adaptation T2 | –.32** | .18* | .03 | .25** | –.44** | .65** | –.04 | –.67** | – | | | | | 4.65 | .93 | .81 | .34 |
| 10. Sociocultural Adaptation T2 | –.40** | .19* | .10 | .27** | –.25** | .31** | –.30** | –.36** | .48** | – | | | | 4.34 | .85 | .83 | .29 |
| 11. Age in years | –.03 | .09 | –.01 | –.20* | –.07 | .00 | –.15 | .01 | –.05 | .01 | – | | | 23.53 | 3.18 | – | – |
| 12. Living time in days | –.07 | .30** | .06 | .16 | –.01 | –.09 | –.03 | –.02 | .04 | .08 | .16 | – | | 280.24 | 398.14 | – | – |
| 13. Gender (Female = 1) | .15 | .17 | .07 | –.14 | .18* | –.15 | .09 | .08 | –.02 | .03 | .27** | .22* | – | 57% | – | – | – |

Primary coping consists of 8 items; secondary coping consists of 7 items; both are anchored 1 to 4; all other variables are anchored 1 to 7

* $p \leq .05$; ** $p \leq .001$

(.35 and .33 respectively). This item was thus removed due to the cross-loading. Both primary and secondary coping demonstrated good internal consistency (see Table 1).

Host Orientation at T1 Chinese host culture orientation included four items from Demes and Geeraert’s (2014) measuring participants’ endorsement of Chinese host-culture orientation. Participants were asked to rate their agreement with four statements, such as “It is important for me to have Chinese friends” and “It is important for me to take part in Chinese traditions,” on a 7-point scale, anchored from 1 = *strongly disagree* to 7 = *strongly agree*. The scale showed acceptable reliability (see Table 1).

Psychological and Sociocultural Adaptation at both Times Outcomes in adaptation were measured by two more recent scales designed to measure one’s “feeling well” and “fitting in” in a new cultural context. The 8-item Brief Psychological Adaptation Scale (PAS for short) and 12-item Brief Sociocultural Adaptation (SCA for short) are the most up-to-date and short instruments used in acculturation studies (Demes and Geeraert 2014). Participants were

asked to “think about living in China” and how much they agreed with 8 statements such as “excited about being in China,” “happy with your day-to-day life,” and “sad to be away from home,” from 1 = *strongly disagree* to 7 = *strongly agree*. PAS measurement is to assess how individuals are “feeling well” or their psychological conditions. Negative items were reversed scored so that higher scores indicated better psychological adaptation.

“Fitting in” was assessed by the SCA at T2, and its T1 equivalent: perceived cultural distance (PCD). PCD asks individuals to indicate “the degree of difference” from 1 = *very different* to 7 = *very similar* for 12 different domains, between China and their home country. Items on the PCD scale were reverse-scored before averaged. SCA asks individuals to indicate “the degree of difficulty to adjusting to life” in these 12 domains, from 1 = *very difficult* to 7 = *very easy*. Domains for the two scales included the same items, namely: “climate,” “natural environment” “social environment,” “living,” “practicalities,” “food and eating,” “family life,” “social norms,” “values and beliefs,” “people,” “friends” and “language.” All measures showed acceptable reliability (see Table 1).

General Stress at both Times General stress was measured using Cohen and colleagues' (Cohen et al. 1983) perceived stress scale (PS), and asked participants to consider in the last few weeks how often they felt, for example, that “things in life were piling up.” Items were rated using a scale that ranged from 1 (*never*) to 7 (*always*). The seven-item measure showed good internal consistency (Table 1).

Data Analysis Plan

First, bivariate correlation analyses were conducted to examine relationships among the chosen variables. Next, longitudinal moderation analyses were conducted to test the role of coping, host orientation, and perceived discrimination in predicting changes in adaptation outcome variables. Longitudinal moderation regression analyses allow researchers to examine how independent variables can lead to incremental changes in outcome variables (Aldwin 2007). We standardized all predictors before computing the interactions to reduce multicollinearity (Aiken et al. 1991). A five-step longitudinal hierarchical linear regression was then conducted on each adaptation outcome. In step 1, the covariates (gender, age, living time in host country, and culture group) and the T1 outcome (general stress, perceived cultural distance, or psychological adaptation) were entered. Perceived discrimination T1 was entered in step 2. T1 moderators—host culture orientation and secondary coping—were entered in step 3. The 3 two-way interaction terms were then entered in step 4. Finally, the three-way interaction terms were entered in step 5 (perceived discrimination \times host orientation \times secondary coping). For the sake of completeness, we performed parallel analyses involving primary coping. Hereafter in interpreting interaction effects, we considered both p values and incremental ΔR^2 . In psychological studies, effect size estimates of interaction effects are often small (e.g., 1–3% additional variance explained), but nonetheless practically meaningful (Champoux and Peters 1987; Chaplin 1991). Interactions (two-way and three-way) were graphed and simple slope analyses conducted to aid in interpretation (Aiken et al. 1991). Hereafter, when describing results of interaction effects, “high” or “low” refers to 1 standard deviation above or below the mean.

Results

Preliminary Analysis

Bivariate correlations indicated that perceived discrimination was negatively related to primary coping, host orientation, and psychological adaptation at both time waves and T2 sociocultural adaptation. Perceived discrimination was positively related to perceived stress at both time waves and T1 cultural distance. Primary coping was moderately correlated with

secondary coping and was significantly related with adaptation outcomes. Secondary coping was negatively related with T1 perceived stress. Host orientation was positively related with psychological adaptation at both times and T2 sociocultural adaptation. All other correlations can be found in Table 1.

Next, we conducted six hierarchical regression models to examine whether T1 perceived discrimination interacted with coping and host orientation in predicting changes in sociocultural adaptation, psychological adaptation, and general stress respectively. Finally, we conducted additional analyses to see if our results would be robust against the inclusion of other relevant variables.

Longitudinal Moderation Analysis for Sociocultural Adaptation

Primary Coping Model In step 1 of Table 2, results indicated that covariates accounted for 12% of the variance in sociocultural adaptation at time 2. In step 2, T1 perceived discrimination accounted for an additional 11% of the variance of sociocultural adaptation over time. In step 3, T1 host orientation and T1 primary coping accounted for an additional 3% of the variance in the model. Host orientation weakly predicted a positive increase in sociocultural adaptation ($\beta = .16, p = .06$). In steps 4 and 5, neither the 3 two-way interactions nor the three-way interaction (perceived discrimination \times host orientation \times primary coping) added significant increments in the explained variance for sociocultural adaptation over time beyond the main effects.

Secondary Coping Model Step 1 and steps 2 results are identical for both coping models. In step 3 of Table 2, T1 host orientation and T1 secondary coping accounted for an additional 2% of the variance in sociocultural adaptation over time. Host orientation yielded a marginally significant effect on sociocultural adaptation ($\beta = .16, p = .06$); secondary coping was not significant. Rather, in step 4, secondary coping interacted with host orientation ($\beta = -.17, p = .07$) and accounted for a 4% change in explaining sociocultural adaptation over time. In step 5, the three-way interaction (perceived discrimination \times secondary coping \times host orientation) was significant ($\beta = .27, p = .01, \Delta R^2 = .04$). Also significant in this step were the main effects of T1 perceived discrimination ($\beta = -.34, p = .001$) and T1 host orientation ($\beta = .20, p = .02$) (Tables 3 and 4).

In order to decompose the three-way interaction effect, simple slope analyses were conducted at varying levels of T1 secondary coping (± 1 SD away from its mean) and T1 host orientation (± 1 SD away from its mean). The various patterns of the three-way interaction are demonstrated by groups 1, 2, 3, and 4 in Fig. 1. As can be seen in Fig. 1, experiencing discrimination at T1 generally reduced sociocultural adaptation over time. In light of this overall trend, however, Group 3

Table 2 Longitudinal hierarchical regression analysis predicting sociocultural adaptation over time

| | Primary coping | | | | | | | | | | Secondary coping | | | | | | | | | |
|---------------------------------------|----------------|----------|--------|----------|--------|--------|--------|----------|--------|----------|------------------|--------|--------|----------|--------|----------|--------|---------|--------|----------|
| | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Step 5 | | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Step 5 | |
| | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p |
| Cultural distance (t1) | -.35 | .00 | -.24 | .01 | -.24 | .01 | -.27 | .01 | -.28 | .01 | -.35 | .00 | -.24 | .01 | -.24 | .01 | -.27 | .00 | -.27 | .00 |
| Gender | .09 | .35 | .08 | .36 | .05 | .57 | .05 | .60 | .05 | .59 | .09 | .35 | .08 | .36 | .04 | .63 | .05 | .60 | .07 | .45 |
| Age | .01 | .93 | .01 | .94 | -.03 | .71 | -.04 | .65 | -.05 | .60 | .01 | .93 | .01 | .94 | -.01 | .92 | .00 | .99 | .03 | .69 |
| Living time | .15 | .10 | .17 | .05 | .16 | .06 | .15 | .08 | .16 | .08 | .15 | .10 | .17 | .05 | .17 | .06 | .16 | .06 | .17 | .05 |
| Cultural group | .12 | .19 | .05 | .61 | .03 | .77 | .04 | .70 | .04 | .67 | .12 | .19 | .05 | .61 | .03 | .76 | .03 | .71 | .04 | .64 |
| Discrimination (t1) | | | -.35 | .00 | -.29 | .00 | -.29 | .00 | -.27 | .00 | -.35 | .00 | -.35 | .00 | -.30 | .00 | -.31 | .00 | -.34 | .00 |
| Coping (t1) | | | .09 | .27 | .09 | .27 | .09 | .32 | .08 | .40 | .03 | .76 | .03 | .76 | .03 | .76 | .03 | .94 | .08 | .38 |
| Host orientation (t1) | | | .16 | .06 | .16 | .06 | .18 | .05 | .16 | .08 | .16 | .06 | .16 | .06 | .16 | .06 | .16 | .07 | .20 | .02 |
| Discrimination x coping | | | .04 | .62 | .05 | .61 | .04 | .62 | .05 | .61 | .04 | .62 | .05 | .61 | .04 | .62 | .05 | .60 | .09 | .37 |
| Orientation x coping | | | -.08 | .38 | -.06 | .55 | -.08 | .38 | -.06 | .55 | -.08 | .38 | -.06 | .55 | -.08 | .38 | -.06 | .52 | -.08 | .37 |
| Discrimination x orientation | | | -.01 | .91 | .02 | .83 | -.01 | .91 | .02 | .83 | -.01 | .91 | .02 | .83 | -.01 | .91 | .02 | .83 | -.01 | .91 |
| Discrimination x coping x orientation | | | | | | | | | | | | | | | | | | | | |
| Model statistics | | | | | | | | | | | | | | | | | | | | |
| <i>F</i> (<i>df</i>) | 3.21 | (5, 119) | 16.67 | (1, 118) | 2.48 | (2116) | .44 | (3, 113) | .56 | (1, 112) | 3.21 | (5119) | 16.67 | (1, 118) | 1.90 | (2, 116) | 1.88 | (3, 11) | 7.33 | (1, 112) |
| <i>R</i> ² | .12 | | .23 | | .26 | | .27 | | .27 | | .12 | | .23 | | .25 | | .29 | | .33 | |
| ΔR^2 | | | .11 | | .03 | | .01 | | .00 | | .11 | | .11 | | .02 | | .04 | | .04 | |

Living time is in days; Cultural group coded (Asian = 1, Non-Asian = 0);

Table 3 Longitudinal hierarchical regression analysis predicting psychological adaptation over time

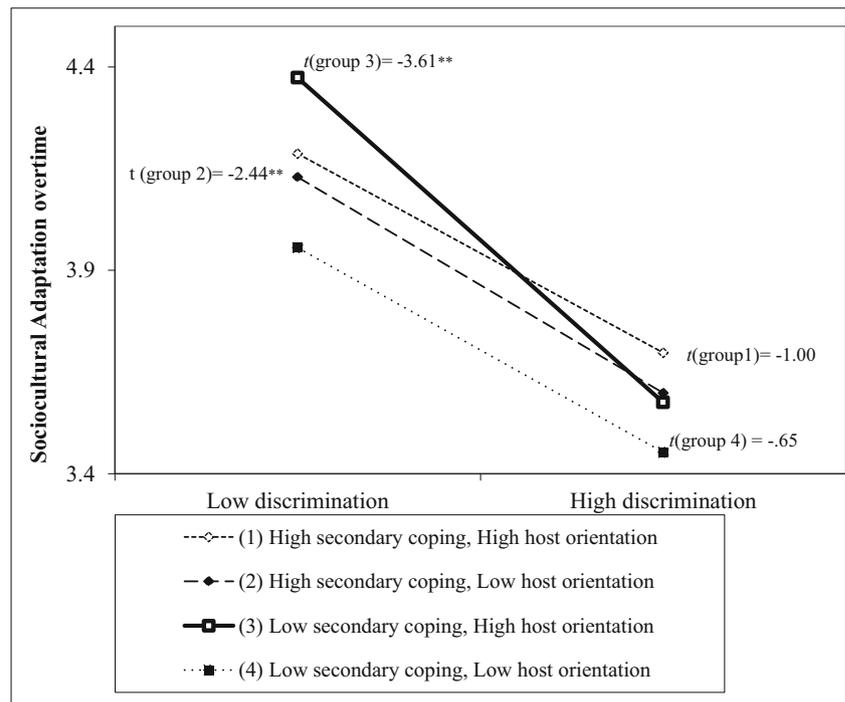
| | Primary coping | | | | | Secondary coping | | | | |
|---------------------------------------|----------------|---------------|--------------|---------------|--------------|------------------|---------------|--------------|---------------|--------------|
| | Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 1 | Step 2 | Step 3 | Step 4 | Step 5 |
| | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p |
| Psychological adaptation (t1) | .66 | .00 | .62 | .00 | .61 | .00 | .62 | .00 | .62 | .00 |
| Gender | .10 | .17 | .11 | .13 | .11 | .15 | .10 | .17 | .11 | .14 |
| Age | .05 | .51 | .04 | .60 | .01 | .88 | .02 | .81 | .05 | .51 |
| Living time | .13 | .09 | .14 | .06 | .13 | .08 | .10 | .18 | .13 | .09 |
| Cultural group: | -.01 | .94 | -.01 | .86 | -.02 | .83 | -.02 | .82 | -.01 | .94 |
| Discrimination (t1) | | | -.14 | .06 | -.12 | .11 | -.10 | .17 | -.14 | .06 |
| Coping | | | .10 | .17 | .10 | .15 | .10 | .18 | -.02 | .75 |
| Chinese orientation | | | -.01 | .91 | .01 | .93 | .00 | .97 | .01 | .89 |
| Discrimination x coping | | | .18 | .02 | .18 | .02 | | | .12 | .14 |
| Orientation x coping | | | .03 | .66 | .04 | .62 | | | -.07 | .34 |
| Discrimination x orientation | | | -.02 | .79 | -.01 | .85 | | | -.02 | .78 |
| Discrimination x coping x orientation | | | | | -.02 | .77 | | | | .01 |
| Model statistics | | | | | | | | | | |
| <i>F</i> (<i>df</i>) | 18.43 (5, 119) | 3.64 (1, 118) | .98 (2, 116) | 2.04 (3, 113) | .01 (1, 112) | 18.43 (5119) | 3.64 (1, 118) | .05 (2, 116) | 1.84 (3, 113) | .01 (1, 112) |
| <i>R</i> ² | .43 | .45 | .46 | .49 | .49 | .43 | .45 | .45 | .48 | .48 |
| ΔR^2 | .02 | .01 | .01 | .03 | .00 | .02 | .02 | .00 | .03 | .00 |

Living time is in days; Cultural group coded (Asian = 1, Non-Asian = 0);

Table 4 Longitudinal hierarchical regression analysis predicting general stress over time

| | Primary coping | | | | | | | | | | Secondary coping | | | | | | | | | |
|---------------------------------------|----------------|----------|--------|----------|--------|----------|--------|----------|--------|----------|------------------|--------|--------|----------|--------|----------|--------|----------|--------|----------|
| | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Step 5 | | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Step 5 | |
| | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p | Beta | p |
| General stress (t1) | .51 | .00 | .47 | .00 | .47 | .00 | .47 | .00 | .45 | .00 | .51 | .00 | .47 | .00 | .47 | .00 | .47 | .00 | .47 | .00 |
| Gender | -.08 | .31 | -.09 | .29 | -.09 | .29 | -.10 | .24 | -.10 | .27 | -.08 | .31 | -.09 | .29 | -.09 | .30 | -.09 | .30 | -.09 | .32 |
| Age | -.04 | .59 | -.04 | .64 | -.04 | .66 | -.04 | .67 | -.03 | .76 | -.04 | .59 | -.04 | .64 | -.04 | .63 | -.03 | .76 | -.02 | .80 |
| Living time | -.04 | .67 | -.05 | .58 | -.05 | .59 | -.04 | .67 | -.04 | .62 | -.04 | .67 | -.05 | .58 | -.05 | .60 | -.04 | .63 | -.04 | .64 |
| Cultural group | -.02 | .79 | -.01 | .93 | -.01 | .92 | .00 | .96 | .00 | .98 | -.02 | .79 | -.01 | .93 | -.01 | .91 | .02 | .84 | .02 | .81 |
| Discrimination (t1) | | | .16 | .05 | .17 | .06 | .16 | .07 | .15 | .09 | | | .16 | .05 | .17 | .06 | .19 | .03 | .18 | .04 |
| Coping | | | -.01 | .87 | -.01 | .87 | -.01 | .92 | .02 | .86 | | | -.02 | .85 | -.02 | .85 | .02 | .77 | .04 | .65 |
| Host orientation | | | .02 | .85 | .02 | .85 | -.01 | .94 | .01 | .92 | | | .02 | .85 | .02 | .85 | -.01 | .96 | .00 | .98 |
| Discrimination x coping | | | -.13 | .12 | -.13 | .12 | -.14 | .10 | -.14 | .10 | | | -.18 | .05 | -.18 | .05 | -.18 | .05 | -.18 | .06 |
| Orientation x coping | | | -.04 | .64 | -.04 | .64 | -.08 | .39 | -.08 | .39 | | | .03 | .73 | .03 | .73 | .10 | .24 | .10 | .25 |
| Discrimination x orientation | | | .07 | .38 | .07 | .38 | .04 | .69 | .04 | .69 | | | .10 | .24 | .10 | .24 | .10 | .24 | .10 | .25 |
| Discrimination x coping x orientation | | | | | | | .12 | .20 | .12 | .20 | | | | | | | | | | .63 |
| model statistics | | | | | | | | | | | | | | | | | | | | |
| <i>F</i> (<i>df</i>) | 8.31 | (5, 119) | 4.02 | (1, 118) | .03 | (2, 116) | 1.02 | (3, 113) | 1.69 | (1, 112) | 8.31 | (5119) | 4.02 | (2, 116) | .03 | (2, 116) | 2.22 | (3, 113) | .26 | (1, 112) |
| <i>R</i> ² | .26 | | .29 | | .29 | | .30 | | .32 | | .26 | | .29 | | .29 | | .33 | | .33 | |
| ΔR^2 | | | | | .03 | | .00 | | .02 | | .01 | | .03 | | .00 | | .04 | | .00 | |

Fig. 1 3-way interaction effect of secondary coping, host orientation and perceived discrimination on sociocultural adaptation at time 2. ** $p < .01$



(low secondary coping and high host orientation) showed the steepest decline in sociocultural adaptation over time as a result of experiencing discrimination at T1, $t(125) = -3.61$, $p = .001$, $d = .63$. The steep simple slope seemed to be driven by Group 3's high sociocultural adaptation at T2 when perceived discrimination at T1 was low. This pattern suggests that when individuals reported little discrimination, their strong orientation toward the host culture predicted better sociocultural adaptation. In contrast, individual's sociocultural adaptation declined sharply when they encountered discrimination presumably because their culturally incongruent coping (low secondary coping) exacerbated the negative consequence of perceived discrimination.

The other three groups exhibited similar simple slopes, but only the slope for Group 2 (high secondary coping and low host orientation) was statistically reliable: $t(125) = -2.44$, $p = .02$, $d = .43$. The main difference among those groups is that Groups 1 (high secondary coping and high host orientation) and 2 (high secondary coping and low host orientation) had generally better sociocultural adaptation than Group 4 (low secondary coping and low host orientation) probably due to the positive main effect of host orientation.

Taken together, our moderation analysis indicates that high levels of secondary coping and host culture orientation are not most effective in buffering the negative effect of perceived discrimination on changes in sociocultural adaptation over time. However, results do show low levels of secondary coping with high levels of host culture orientation (Group 3) to have an exacerbating effect. Such asymmetry suggests that culturally incongruent coping may yield the worse sociocultural

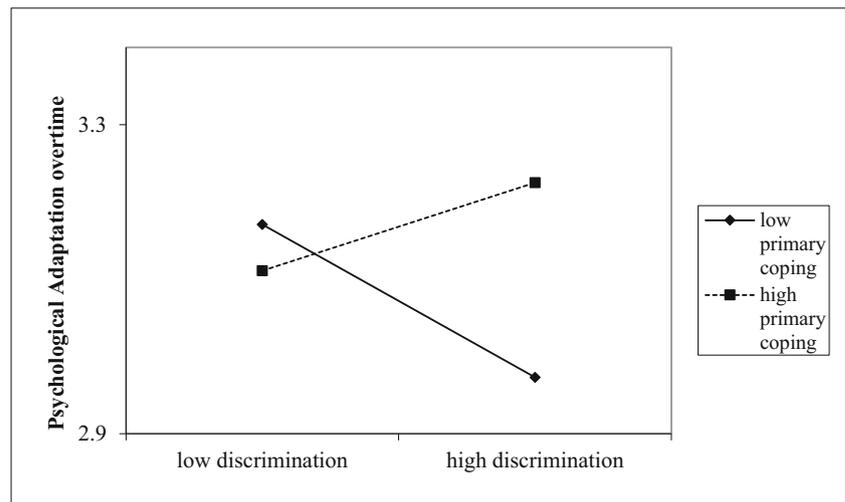
adaptation for international students who are strongly oriented to Chinese culture. While the presence of a 3-way interaction is consistent with the cultural fit hypothesis, the pattern of the results only provides partial support.

Longitudinal Moderation Analysis for Psychological Adaptation

Primary Coping Model In step 1, results indicated that covariates accounted for 43% of the variance in psychological adaptation over time. In step 2, T1 perceived discrimination accounted for an additional 2% of the variance of general stress over time. In step 3, T1 host orientation and T1 primary coping were not significant and accounted for no change in variance in the model. Instead, in step 4, primary coping interacted with perceived discrimination ($\beta = .18$, $p = .02$). Step 4 accounted for an additional 3% of the variance change in psychological adaptation over time. Finally in step 5, the three-way interaction (perceived discrimination \times host orientation \times primary coping) did not add any increment in the model.

Figure 2 demonstrated how primary coping functions as a moderator in the discrimination-psychological adaptation relationship. According to simple slope analyses, when students used low levels of primary coping at T1, T1 discrimination was negatively related to changes in psychological adaptation over time, $t(125) = -2.14$, $p = .03$, $d = .38$. Under high levels of primary coping at T1, the discrimination-psychological adaptation relationship was not significant $t(125) = .52$, $p = .60$. Thus, primary coping seemed to buffer the negative effect of

Fig. 2 Primary coping mitigates the negative effect of perceived discrimination on psychological adaptation



perceived discrimination on psychological adaptation over time. Thus, the results are inconsistent with either cultural fit or goodness of fit hypothesis.

Secondary Coping Model (Results for Step 1 and 2 are identical for both coping models). In step 3 of this analysis, the main effects of T1 host orientation and T1 secondary coping did not account for any incremental changes in predicting psychological adaptation over time. Steps 4 and 5 also yielded no significant two-way or three-way interactions.

Longitudinal Moderation Analysis for Perceived Stress

Primary Coping Model In step 1, results indicated that covariates accounted for 26% of the variance in general stress over time. In step 2, T1 perceived discrimination accounted for an additional 3% of the variance of general stress over time. In step 3, T1 host orientation and T1 primary coping were did not account for incremental changes in the model. Steps 4 and 5 also yielded no significant two-way or three-way interactions.

Secondary Coping Model (Step 1 and 2 results are identical for both coping models). In step 3, T1 host orientation and T1 secondary coping accounted for an additional 2% of the variance in sociocultural adaptation over time. In step 3, T1 host orientation and T1 secondary coping did not yield significant results. Instead in step 4, the interaction effect with the two was marginally significant ($\beta = -.18, p = .05$) and accounted for an additional 4% of the variance change in general stress over time. In step 5, the three-way interaction did not add any incremental change in the model.

In Fig. 3, simple slope analysis indicated that T1 discrimination exerted a positive effect on general stress over time under low levels of T1 secondary coping, $t(125) = 3.00, p = .03, d = .54$. Yet, when high levels of secondary coping were utilized, perceived discrimination no longer predicted

general stress over time, $t(125) = .96, p = .34$. In other words, secondary coping buffered the negative effect of perceived discrimination on general stress over time. Because of the absence of a significant three-way interaction, the results are consistent with both cultural fit and goodness of fit hypotheses.

Robustness Tests

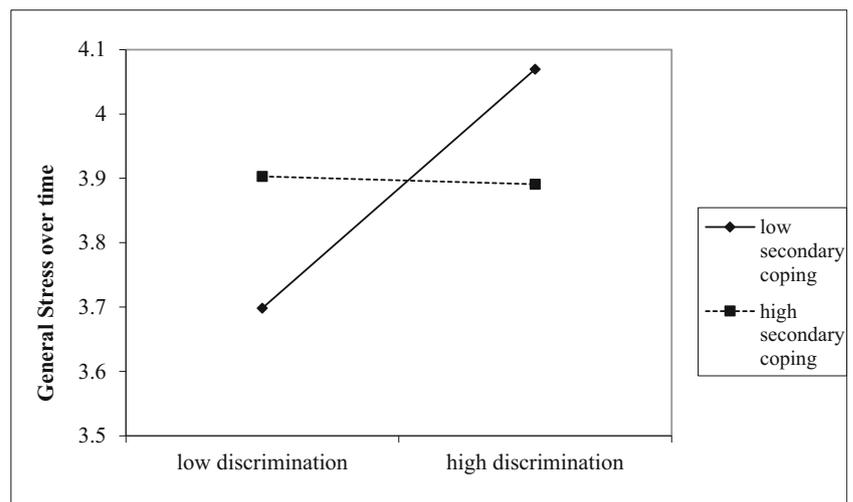
We conducted additional analyses to examine whether the results would be robust against a number of conditions: a) the inclusion of both coping strategies, b) the removal of control variables, c) the inclusion of cultural groups as another moderator. No major changes were found in the results above. All additional analyses and interpretations can be found in the [supplementary materials](#).

Discussion

In this study, we followed international students in China over the span of one semester. Two aspects of this study can be distinguished from previous research on sojourner adaptation: our focus on a non-Western or collectivistic context in which secondary coping is thought to be more culturally appropriate and the inclusion of host culture orientation as a variable moderating the effectiveness of coping strategies in adaptation. On the whole, our research provides further support for perceived discrimination as one of the strongest predictors of adaptation across cultural contexts (Berry 2006). However, our major contributions are described below.

This study sought out to address two important questions: 1) Are coping strategies influenced by the cultural contexts and, 2) Whether the use of secondary coping helps with the mitigation of perceived discrimination during a cross-cultural transition? Interestingly, the moderating roles of coping and host orientation differed across acculturation outcomes. For

Fig. 3 Secondary coping mitigates the negative effect of perceived discrimination on general stress over time



sociocultural adaptation, culturally incongruent coping (i.e. low levels of secondary coping) with strong host orientation worsened the negative effect of perceived discrimination. The negative effect of perceived discrimination on perceived stress over time was attenuated by secondary coping, but it occurred regardless of levels of host orientation. Finally, the negative effect of perceived discrimination on psychological adaptation was attenuated by primary coping. Given the inconsistent findings across adaptation outcomes, we next consider what each means in light of previous research and offer some ideas for future research.

Discrimination, Secondary Coping, and Sociocultural Adaptation

The only three-way interaction occurred with sociocultural adaptation. What is noteworthy is that we detected an asymmetric effect. Specifically, high secondary coping combined with strong host orientation failed to ameliorate the negative effect of perceived discrimination; what's worse is that it was low secondary coping combined with strong host orientation that showed an exacerbating effect. What this latter finding suggests is that when one is strongly oriented to the host culture yet copes in a way that misaligns with the norm of that culture, it leads to more problems. This “cultural mismatching” may arise from an uneasy conflict between wanting to fit in and not actually fitting in, thus lowering sociocultural adaptation.

Why did host orientation emerge as a moderator only pertaining to sociocultural adaptation? One answer may rest in the nature of the construct itself. Sociocultural adaptation is directly tied to cultural fit and is conceptualized as successfully fitting oneself with the new culture. As indicated by the positive effect of host orientation on sociocultural adaptation, whether one orients oneself to the host culture and whether one's coping strategy is in line

with the host cultural norm should be more conceptually relevant to sociocultural adaptation than general psychological functioning. Another possibility is that we assessed sociocultural adaptation in slightly different ways at the two time points, whereas identical measures of psychological adaptation and general stress were used. This change in measurement may be responsible for the three-way interaction on sociocultural adaptation over time. However, we do not deem this methodological interpretation likely because there are conceptual reasons for the different assessment of sociocultural adaptation across time (Demes and Geeraert 2014).

Discrimination, Secondary Coping, and General Stress

Our study found an interaction between perceived discrimination and secondary coping on general stress, which was not further moderated by host orientation. This finding is consistent with the goodness of fit hypothesis, the idea that when individuals encounter a problem that is out of their control, accepting and reframing the problem helps to diminish its negative impact and can lead to better adjustment (Szabo et al. 2016). Thus, secondary coping protected international students in China from experiencing the negative effect of perceived discrimination over time likely because it is better tailored to the largely uncontrollable nature of perceived discriminatory behaviors. For example, reminding oneself that certain behaviors (e.g., being stared at or being called names) may not be understood by the local Chinese to be discriminatory (reframing) in order to neutralize the sting of perceived discrimination, may be a more effective cognitive strategy for adaptation, at least in the short run. On the other hand, this finding is also supportive of the cultural fit hypothesis, which states that secondary coping is effective in the Chinese cultural context because it is culturally appropriate. This present finding is also similar to the study by

Wei et al. (2008) that found secondary coping strategies failed to provide a protective function for Asian international students in the American cultural context.

Discrimination, Primary Coping, and Psychological Adaptation

Contrary to our expectations, primary coping, rather than secondary coping, was found to buffer the negative effect of perceived discrimination on psychological adaptation over time for international students in China. One reason for this counterintuitive finding is that primary coping may have some beneficial effects even in collectivistic cultures. For example, a recent study on primary vs. secondary control conducted in Japan found that Japanese students preferred changing the environment (primary control) if they could maintain interpersonal harmony with peers, but its effectiveness depended on the situation (Sawaumi et al. 2015). Thus, it may be overly simplistic to portray adaptive coping styles in Asian cultural contexts as exclusively secondary.

A second possibility, which is rarely examined in acculturation research, is that primary and secondary coping may be related to different types of psychological outcomes during acculturation. Given the fundamental feature of primary control (i.e. influencing the environment; Morling and Evered 2007), primary coping may be particularly effective in restoring aspects of well-being that are predicated on the satisfaction of competence or mastery needs (Deci and Ryan 2002). In contrast, secondary coping may be more associated with aspects of well-being that fulfill interpersonal needs (Lu 2010; Deci and Ryan 2002) and reflect low-arousal positive affect (Tsai et al. 2006). Such a theoretical analysis suggests that primary coping may be a somewhat universal strategy for maximizing certain well-being outcomes during acculturation, but not necessarily others. In our study, we used the brief psychological adaptation scale that included typical positive (e.g., excitement, freedom) and negative (e.g., loneliness and homesickness) feelings in relation to both host and home countries (Demes and Geeraert 2014). Distinct types of well-being and emotional varieties were possibly conflated in this measure. Although this unexpected finding and several parts of this study need to be replicated; it nevertheless points to the usefulness of including multiple measures of well-being (e.g., reduction of negative states versus maximization of positive states, low- versus high-arousal positive states, and hedonic versus eudaemonic well-being) to empirically compare the implications of primary and secondary coping for different types of well-being, many of which are known to vary across cultures. In addition to distinguishing between doing well and feeling well, it will be important in future research to identify dimensions of well-being that are more or less sensitive to primary and secondary coping.

Limitations and Suggestions for Future Research

Despite promising results and potential contributions to the cultural fit and goodness of fit literature, the present research has a number of limitations. The first limitation has to do with the choice of our measures. Factor analysis of the COPE measure identified one secondary coping item that cross-loaded on primary coping. Moreover, when filling out this measure, our participants were not instructed to report how they dealt with discrimination, but acculturative problems in general. Thus, our study cannot differentiate general strategies from strategies of coping with discrimination as a specific stressor.

Secondly, the challenge of conducting a longitudinal study on sojourners in China greatly constrained the sample size we were able to obtain, thus making the study underpowered. McClelland and Judd (1993) argued that actual power for moderation analyses is often very low when one or both variables are continuous. Aguinis et al. (2005) suggested that for power analysis of moderation effects, f^2 of 0.005, 0.01, and 0.025 be adopted for realistic estimates of small, medium, and large effects respectively. In our case, even if we assume f^2 of the three-way interaction to be large, we would have needed a sample size of 316 to achieve 80% power. Close replications based on much larger sample sizes will be needed to confirm or disconfirm our findings.

Also, more longitudinal studies should be conducted to track larger groups of sojourners in order to better understand the complexity of their acculturation. As stated by Heppner et al. (2014), cross-lag temporal studies or multi-level modeling could also demonstrate cultural fit and congruency. A cross-lag temporal study would allow researchers to predict patterns of cultural fit over time and would demonstrate cultural fit during cross-cultural adjustment.

Finally, as a result of our attempt to sample a wide range of sojourners, the total length of stay in China varied greatly. This limits our ability to know precisely to which early stage of acculturation our findings apply. We do not know, for example, whether the same would be found among sojourners within 6 months of arrival. A related issue is that coping styles have been reported to differ greatly by ethnicity and country of origin (Kuo 2014). Given the relatively small sample size, our study was further limited in its ability to discover potential sub-sample differences. Thus, it is also possible that our results do not reflect all cultures or countries in the sample equally. After the inspection of the 'cultural group' variable as a potential moderator (presented in the [supplementary materials](#)), it is apparent that not all individuals acculturate in the same way and that acculturation can vary by cultural origin.

Notwithstanding these limitations, this study is one of the few that attempted to unpack the role of coping strategies for sojourners in non-Western cultural contexts. One of the most important questions raised in this study is the complexity of

whether coping strategies are influenced by the cultural contexts and across what adaptation outcomes. Our findings draw attention to a range of theoretically plausible ways in which coping strategies may interact with individual and contextual variables in shaping adaptation outcomes. Ultimately, we hope that the current findings will motivate further integrative research and that universities and institutions can utilize studies like this to facilitate more successful transitions for sojourners around the world, and in particular, in non-Western, collectivistic cultural contexts.

Compliance with Ethical Standards

Conflict of Interest Authors declare no conflict of interest.

Ethical Approval and Informed Consent All procedures and measures were approved by the recommendations of the Institutional Review Board of the Psychology Department of the university with written informed consent from all participants. All subjects gave written informed consent in accordance with the Declaration of Helsinki.

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