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# Exploring personality traits as predictors of English achievement and global competence among Chinese university students: English learning motivation as the moderator☆

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ABSTRACT

This study aimed to delve deeper into the relationship between personality traits and academic performance by focusing on two specific aspects that can be critically important in the globalized world: global competence and achievement in learning English as a second language. We recruited 555 Chinese university students who completed a web-based survey. Results revealed that the Big Five Personality (conscientiousness, neuroticism, extraversion, openness, and agreeableness) functioned differently in predicting the outcome variables. Conscientiousness and extraversion positively predicted English achievement. Extraversion and openness positively predicted all three dimensions of global competence (global attitudes, skills, and knowledge). Agreeableness positively predicted global attitudes. Conscientiousness positively predicted global knowledge but negatively predicted global attitudes, while neuroticism negatively predicted global skills and attitudes. Furthermore, English learning motivation was found to moderate the relationships of extraversion to English achievement and global knowledge. Specifically, the two positive relationships were stronger at high than at low levels of motivation.

## 1. Introduction

One important assumption in individual differences research is that students who differ in personality traits will also differ in learning behaviors and learning outcomes (Poropat, 2009). Abundant research has established the relationship between personality and overall academic achievement (e.g., De Feyter, Caers, Vigna, & Berings, 2012; Komarraju, Karau, Schmeck, & Avdic, 2011; Vedel, Thomsen, & Larsen, 2015). In recent years, researchers have emphasized the importance of understanding the role of personality in achievement in specific subjects and/or capacities, rather than simply the overall achievement (Rosander, Bäckström, & Stenberg, 2011). Researchers also note that the personality-achievement relationship is overwhelmingly investigated within European or North American settings, and more research is thus needed to understand this relationship within other sociocultural settings (Kao & Craigie, 2014). Responding to these calls, the present study focuses on Chinese university students and examines the relationship of personality traits to global competence and English achievement, both of which are important instrumental tools largely determining effectiveness in the current globalized world (Meng, Zhu, & Cao, 2018).

Global competence is defined as having knowledge and capacity to identify cultural differences, possessing interest and willingness to interact with culturally different people, and utilizing cultural skills to effectively function in different cultural contexts (Hunter, White, & Godbey, 2006). Researchers argue that nurturing students' global competence should become one core educational goal for mass education, rather than just for elite education (Reimers, 2009). In China, English learning and teaching are assigned a central role in both secondary and post-secondary education, whereas many students fail to achieve a desired level of proficiency in English, due to a lack of purposive and individualized educational perspectives (Wen, 2018).

As noted above, whether and how personality traits are related to

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global competence and foreign language (FL) achievement need to be researched and understood. However, this research objective receives scant attention in the existing literature. Moving beyond this objective, we intend to further expand the extant literature by combining personality traits and English learning motivation. Since scholars have argued that motivation and personality may work jointly and synergistically to determine performance (Di Domenico & Fournier, 2015), English learning motivation is examined in our study as a potential moderator in the relationships between personality traits and English achievement.

## 2. Literature review

### 2.1. Personality and FL achievement

The Big Five model of personality (conscientiousness, neuroticism, extraversion, openness, and agreeableness; Goldberg, 1992) has been revealed as a robust approach to conceptualizing and assessing personality traits (e.g., Kappe & van der Flier, 2010; Rizvanović, 2018). Among the five dimensions, conscientiousness is consistently confirmed as the best predictor of academic success. Conscientious students often have better academic performance because they are featured by organized, disciplined, perseverant, and precise manners of learning (De Feyter et al., 2012; Rosander et al., 2011). The meta-analyses found that conscientiousness had the strongest correlates with university students' academic performance (O'Connor & Paunonen, 2007; Richardson, Abraham, & Bond, 2012; Vedel, 2014). By contrast, neurotic students, characterized by emotional instability and lack of control in day-to-day situations, often achieve lower academic performance due to their high anxiety associated with exams and academic pressures, and their less dedication to achievement (Kappe & van der Flier, 2010; Komarraju et al., 2011). We assume that the impact of conscientiousness and neuroticism may also apply to the specific achievement in FL learning. Supportive evidence can be found in the study by Kao and Craigie (2014) who surveyed a group of Taiwanese students and found that neuroticism negatively predicted FL achievement. MacIntyre and Charos (1996) found that conscientiousness was indirectly and positively related to second language fluency through attitudes towards learning situations among a group of Anglophone students.

As compared to the above two personality traits, empirical evidence on predictive roles of extraversion, openness and agreeableness in academic performance is mixed (O'Connor & Paunonen, 2007). Trapmann, Hell, Hirn, and Schuler's (2007) meta-analysis revealed that these three traits were not related to academic success at university, whereas Vedel's (2014) meta-analysis found that both openness and agreeableness significantly correlated with university students' Grade Point Average (GPA). Extraversion describes individuals who are social, assertive, and talkative (Komarraju et al., 2011). Many researchers reported no or even negative correlations between extraversion and academic performance among university students (De Feyter et al., 2012; Furnham, Nuygards, & Chamorro-Premuzic, 2013; Komarraju et al., 2011; Poropat, 2009; Rosander et al., 2011). We assume, however, that extraversion may be beneficial for FL learning due to its different features from other academic disciplines. For instance, learning a language cannot be separated from using the language, thus needing willingness and courage to speak, communicate and collaborate in the target language (Wen, 2018). Extraverted students may excel in such aspects since they are proactive, gregarious, and always ready to engage (Kappe & van der Flier, 2010; Rizvanović, 2018). Empirical support can be obtained from a recent study (Liang & Kelsen, 2018) in which extraverted Japanese college students were found to possess superiority in English oral presentations. In addition, Biedroń (2011) found that Polish university students higher in extraversion tended to achieve better grades in language ability tests. Openness is reflected in a strong intellectual curiosity and a preference for variety and novelty (Komarraju et al., 2011). Despite being limited, a few studies have revealed the positive relationship between openness and FL achievement (Rizvanović, 2018; Rosander et al., 2011). Agreeableness includes qualities of altruism, friendliness, modesty, cooperative behaviors and generosity (Komarraju et al., 2011). Inconsistent associations between agreeableness and academic performance were found in the literature. Specifically, while Komarraju et al. (2011) and De Feyter et al. (2012) revealed agreeableness as a positive predictor of academic achievement, Kappe and van der Flier (2010) and Zhou (2015) found no associations between the two constructs. More relevant to our research objective is the study conducted by Shirdel and Naeini (2018) who found a strong positive relationship between agreeableness and English achievement among university undergraduates.

### 2.2. Personality and global competence

Researchers argue that the concept of global competence can be used interchangeably with intercultural competence, multi-cultural competence, or intercultural sensitivity, though these concepts are often assessed with different dimensions (Li, 2013; Meng et al., 2018; Semaan & Yamazaki, 2015). Researchers have reached an agreement on dimensions of global competence: knowledge, skills and attitudes (Hunter et al., 2006; Li, 2013; Meng et al., 2018). Global knowledge means the knowledge of one's own culture and alien cultures, including traditions, norms, history and other aspects, which provides background information for intercultural interactions; global skills mean an array of capacities enabling one to function in intercultural settings, such as identifying cultural differences and successfully participating in intercultural settings; global attitudes mean positive attitudes towards cultural differences and willingness to embrace and engage in cultural diversity (Hunter et al., 2006; Li, 2013). Therefore, the three dimensions should be operationalized as separate constructs because they may be inter-correlated yet conceptually distinctive.

Recently, researchers stress that more attention should be given to domestic students who are much greater in number than internationally mobile students and also need to prepare for globalization (Jon, 2013; Meng, Zhu, & Cao, 2017). Studies that attempt to explore individual differences in global competence are scarcely available in the existing literature. Nonetheless, prior findings of individual differences in some related constructs (e.g., intergroup attitudes, intercultural friendships, and cross-cultural adjustment) can support our assumption that personality may play a part in global competence. For instance, conscientious individuals tend to be featured by conservatism and traditionalism (Roberts, Chernyshenko, Stark, & Goldberg, 2005), implying that they may be less willing to engage in cultural diversity. Supporting this argument, Stupar, van de Vijver, Te Lindert, and Fontaine (2014) found a negative relationship between conscientiousness and multiculturalism among Dutch majority members and immigrants. Therefore, we assume that conscientiousness is a negative predictor of global competence. The negative link with global competence may also apply to neuroticism featured by social anxiety, social insecurity and moodiness (Ramirez, 2016). Such profiles may undermine individuals' willingness for and effectiveness in intercultural engagement. Ang, Van Dyne, and Koh (2006) provided empirical evidence that Singaporean undergraduates higher in neuroticism scored lower on the behavioral dimension of cultural intelligence, a construct reflecting “capacity to acquire new behaviors appropriate for a new culture” (Earley & Ang, 2003, p. 82). Wilson, Ward, and Fischer's (2013) meta-analysis also revealed that neuroticism negatively correlated with sociocultural adjustment based on a total of 66 independent studies.

The other three personality traits (i.e., openness, extraversion, and agreeableness) are key dispositions strongly influencing the way individuals behave in interpersonal communication and relations (Barrick, Parks, & Mount, 2005; Vater & Schröder-Abé, 2015). For instance, individuals low in openness may view sojourning in culturally different contexts as threatening and intimidating, while those high in openness may view such experiences as interesting and exciting (Van

der Zee & van Oudenhoven, 2013). Turner, Dhont, Hewstone, Prestwich, and Vonofakou (2014) explored the relationships of these three personality traits to cross-cultural friendships, intergroup anxiety, and outgroup attitudes among British undergraduate students. Their results showed that extraversion positively predicted cross-cultural friendships, openness negatively predicted intergroup anxiety but positively predicted outgroup attitudes, and agreeableness negatively predicted intergroup anxiety. Burke, Watkins, and Guzman (2009) focused on international students sojourning in Latin America and identified openness and agreeableness as positive predictors of adjustment to the multi-cultural contexts. In another instance, both extraversion and openness positively predicted Vietnamese Australian students' cross-cultural self-efficacy (Mak & Tran, 2001). Supporting evidence can also be found in Wilson et al.'s (2013) meta-analysis in which all the three personality traits positively correlated with sociocultural adjustment: for openness ($r$ = 0.29), for extraversion ($r$ = 0.29), and for agreeableness ($r$ = 0.16).

### 2.3. Direct and moderating effects of FL learning motivation

According to the self-determination theory (Deci & Ryan, 2000), human motivation, boosted by basic psychological need satisfaction, largely determines engagement and performance in an activity or task. The present study focuses on a specific type of motivation, namely English learning motivation. Its positive relationship to English achievement has been solidly established (e.g., Hernández, 2006; Rizvanović, 2018). We aim to delve deeper into the topic by investigating moderating role of motivation in the personality-English achievement relationship. The underlying rational for this moderation perspective is that some scholars postulate that motivational attributes may modify the personality-performance relationship and recommend more research to empirically examine the complex relationships between personality, motivation, and performance (or development) (Barrick, Mount, & Li, 2013). According to Di Domenico and Fournier (2015), highly motivated individuals tend to invest extra resources (e.g., time and energy) in pursuing performance or development, thus having potentials to attenuate weaknesses or boost strengths of personality traits. There is also some empirical evidence that support our moderation perspective. For instance, Barrick et al. (2005) surveyed Executive MBA students and found that in working contexts, the positive relationships of extraversion, openness, and emotional stability (conversely neuroticism) to interpersonal performance only appeared at low levels of self-monitoring motivation. In academic contexts, Belgian college freshmen's academic motivation was revealed as a moderator in the relationship between conscientiousness and academic performance (De Feyter et al., 2012). Specifically, this positive relationship was shown only at high levels of academic motivation. Di Domenico and Fournier (2015) yielded a somewhat contradictory finding among Canadian undergraduate students. Their study showed that the relationship between conscientiousness and cumulative GPA was significant only at low levels of autonomous motivation. Given the inconsistent and rather scarce evidence, our study will put forward a research question concerning moderating roles of English learning motivation, rather than offer specific hypotheses.

On the surface, the two constructs of English learning motivation and global competence seem to be unrelated. However, if we consider potential affective, behavioral and cognitive changes underlying the motivational attitudes, it may make sense to assume their relationship. The theory of planned behavior (TPB; Ajzen, Czasch, & Flood, 2009) articulates that perceived control over social norms and attitudes can influence one's behavioral motivation, which increases the probability of implementing actual behaviors to pursue his or her goals. According to the TPB, goals, motives, and needs are closely associated with goal-striving behaviors (Lonsdale, 2017). Thus, TPB implies that those highly motivated students may have the impetus to invest time and effort in pursuing better grades or achievement in English through diverse types of behaviors, such as reading English materials, viewing English programs, or initiating communication with native speakers. These behaviors function as adding diverse extra sources of information and knowledge about norms, traditions and history of alien cultures. A better understanding of and identification with alien cultures can lead to affective, behavioral and cognitive changes, for example, shaping intergroup attitudes and building intercultural relations (Cao, Meng, & Shang, 2018). Therefore, it is assumed that English learning motivation may be beneficial for global competence as measured by global knowledge, attitudes, and skills. The supportive evidence can be found in Semaan and Yamazaki's (2015) study which established a direct and positive association between English learning motivation and global competence.

### 2.4. The present study

Built on the aforementioned research, this study intends to examine whether the five personality traits can be related to English achievement and global competence, and whether English learning motivation can moderate the relationships between the five traits and English achievement.

Concerning direct relationships, the hypotheses are formulated

**H1.** Conscientiousness (H1a), extraversion (H1b), openness (H1c), and agreeableness (H1d) will be positively associated with English achievement, while neuroticism (H1e) will be negatively associated with English achievement.

**H2.** Extraversion (H2a), openness (H2b), and agreeableness (H2c) will be positively associated with global competence, while conscientiousness (H2d) and neuroticism (H2e) will be negatively associated with global competence.

**H3.** English learning motivation will be positively associated with English achievement (H3a) and global competence (H3b).

Concerning moderated relationships, the research question is raised

**RQ.** Will English learning motivation moderate the relationships between personality traits and English achievement?

## 3. Methods

### 3.1. Participants and procedure

Participants were second-year students at a large comprehensive university in China. Chinese government requires most undergraduates to enroll for the course of learning English as a second language at the first two years of university education. We purposively selected the second-year students because it is their final academic year for mandated English learning and they have had one-whole-year English learning experiences at university.

To reach the participants, eight English teachers were contacted after the approval for conducting this work was obtained from the research ethics committee of the university. With their assistance, the online survey was distributed to students they taught via a social media. Voluntary participation, anonymity, and research objectives were sent together with the link to the online survey. All procedures performed in this study were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Of the 555 participants, there were 367 male students (66.1%) and 188 female students (33.9%). Their ages ranged from 16 to 29 ($M$ = 19.50; $SD$ = 1.10). Their reported academic majors were as follows: 423 (76.2%) in natural sciences and 132 (23.8%) in social sciences and humanities. Four students (0.7%) had study abroad experiences and fifty-nine students (10.6%) had travelling abroad experiences. There were no missing data in the data set.

**Table 1**
Means, standard deviations and correlations of the variables ($N$ = 555).

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Conscientiousness | – | | | | | | | | | | | | | | |
| 2. Neuroticism | −0.281** | – | | | | | | | | | | | | | |
| 3. Agreeableness | 0.080 | −0.174** | – | | | | | | | | | | | | |
| 4. Openness | 0.237** | −0.342** | 0.458** | – | | | | | | | | | | | |
| 5. Extraversion | 0.359** | −0.262** | 0.405** | 0.611** | – | | | | | | | | | | |
| 6. Learning motivation | 0.280** | −0.235** | 0.315** | 0.358** | 0.397** | – | | | | | | | | | |
| 7. Overall achievement | 0.385** | −0.203** | 0.238** | 0.287** | 0.382** | 0.529** | – | | | | | | | | |
| 8. Speaking | 0.424** | −0.228** | 0.207** | 0.323** | 0.431** | 0.513** | 0.768** | – | | | | | | | |
| 9. Listening | 0.396** | −0.217** | 0.159** | 0.294** | 0.368** | 0.493** | 0.728** | 0.776** | – | | | | | | |
| 10. Reading | 0.346** | −0.183** | 0.263** | 0.317** | 0.366** | 0.499** | 0.810** | 0.670** | 0.645** | – | | | | | |
| 11. Writing | 0.391** | −0.199** | 0.247** | 0.328** | 0.417** | 0.517** | 0.761** | 0.694** | 0.630** | 0.761** | – | | | | |
| 12. Global attitudes | 0.146** | −0.404** | 0.467** | 0.589** | 0.489** | 0.361** | 0.281** | 0.291** | 0.268** | 0.276** | 0.278** | – | | | |
| 13. Global skills | 0.278** | −0.388** | 0.382** | 0.587** | 0.561** | 0.423** | 0.359** | 0.374** | 0.390** | 0.348** | 0.346** | 0.741** | – | | |
| 14. Global knowledge | 0.355** | −0.279** | 0.245** | 0.450** | 0.472** | 0.427** | 0.432** | 0.422** | 0.480** | 0.404** | 0.445** | 0.490** | 0.702** | – | |
| 15. Gender (Male) | −0.080 | 0.013 | 0.105* | 0.037 | −0.011 | 0.074 | 0.081 | 0.051 | −0.008 | 0.038 | 0.076 | −0.121** | 0.019 | 0.109* | – |
| *M* | 2.98 | 2.57 | 3.70 | 3.62 | 3.19 | 2.99 | 2.96 | 2.84 | 2.74 | 3.05 | 2.96 | 3.73 | 3.38 | 3.09 | 0.66 |
| *SD* | 0.85 | 0.82 | 0.79 | 0.78 | 0.81 | 0.89 | 0.76 | 0.83 | 0.87 | 0.81 | 0.79 | 0.76 | 0.73 | 0.74 | 0.47 |

Note.
* $p < .05$.
** $p < .01$.

### 3.2. Measures

#### 3.2.1. Personality traits

This scale was measured by Chinese Big Five Personality Inventory-Brief Version (CBF-PI-B; Wang, Dai, & Yao, 2011). This inventory has been validated and widely used in Chinese contexts. Seven items assessed conscientiousness (e.g., I make decisions after careful consideration), seven items assessed neuroticism (e.g., I often worry about things that are of little importance), six items assessed extraversion (e.g., I like social interactions and social events), eight items assessed openness (e.g., I am curious about many different things), and five items assessed agreeableness (e.g., I am considerate and kind to almost everyone). The response categories ranged from 1 (not at all applicable to me) to 5 (very much applicable to me). Cronbach's alpha was 0.87 for conscientiousness, 0.92 for neuroticism, 0.88 for extraversion, 0.93 for openness, and 0.86 for agreeableness.

#### 3.2.2. Global competence

Global competence scale, validated by Meng et al. (2018), included 15 items (Hunter et al., 2006; see Appendix A for specific items). Each of the three subscales (i.e., global knowledge, skills, and attitudes) contained five items. Global knowledge measured the level of knowledge related to one's own and foreign cultures, world events and history. Global skills measured capabilities to engage in intercultural activities and collaborate cross cultures. Global attitudes measured students' attitudes towards cultural differences and their willingness to engage in those differences. The response categories ranged either from 1 (strongly disagree) to 5 (strongly agree) or from 1 (very low) to 5 (very high). Higher scores of each subscale indicated higher levels of global competence on the respective dimension. Cronbach's alpha was 0.90 for knowledge, 0.90 for skills, and 0.91for attitudes.

#### 3.2.3. English learning motivation

This uni-dimensional scale was measured by six items (Yashima, Zenuk-Nishide, & Shimizu, 2004, see Appendix A for specific items). Students were asked to rate the extent to which each statement matched their self-perceived motivation for learning English. The response categories ranged from 1 (strongly disagree) to 5 (strongly agree) and a higher score was reflective of a higher level of motivation for English learning. Cronbach's alpha was 0.92.

#### 3.2.4. English achievement

In this study, we used the self-report method to assess students' English achievement for two reasons. First, the participants in our study were from various faculties and had different test formats for English achievement. Thus, it is not suitable to use their prior English test scores to assess their achievement. Second, research has shown that self-reports of language achievement are reliable (see Marian, Blumenfeld, & Kaushanskaya, 2007, for a review of language self-assessment studies) and have been widely used in the literature (e.g., Meng et al., 2018; Sullivan & Schatz, 2009). Despite these reasons, it needs to be admitted that a range of factors may influence validity of self-assessment, including participants' experiences with the assessed language domain skills (Ross, 1998). English achievement was assessed in five aspects (Kim, Wang, Deng, Alvarez, & Li, 2011): speaking, listening, reading, writing, and overall proficiency. The participants rated each aspect by picking one of the following response options: “very low”, “low”, “average”, “high”, “very high”. Cronbach's alpha was 0.93.

### 3.3. Data analysis

Using the AMOS 22.0 software, we evaluated the research model by conducting structural equation modeling (SEM) through Maximum Likelihood method. Five goodness-of-fit indices were used to assess the model fit: $\chi^2/df$ ratio ($< 3$), comparative fit index (CFI, $> 0.95$), Tucker-Lewis index (TLI, $> 0.90$), root-mean-square error of approximation (RMSEA, $< 0.06$) and standardized root-mean-square residual (SRMR, $< 0.08$) (Hu & Bentler, 1999).

## 4. Results

### 4.1. Preliminary analysis

Since previous research indicated that there were gender differences in English performance (Zhou, 2015) and global competence (Meng et al., 2017), gender was included in the correlational analysis. Besides, overall and domain-specific achievement (speaking, listening, reading, and writing) were included in the analysis to gain an comprehensive picture of correlations between personality and English achievement. Means, standard deviations, and correlation coefficients are presented in Table 1. As shown in the table, conscientiousness, agreeableness, openness, extraversion and English learning motivation were positively correlated with indicators of English achievement and dimensions of global competence, whereas neuroticism was negatively correlated with them. In addition, gender (male) was negatively correlated with global attitudes and positively correlated with global knowledge, and

**Table 2**
Composite reliability (CR), average variance extracted (AVE) and square roots of AVE for latent constructs in the measurement model.

| Variables | CR | AVE | Square roots of AVE |
|---|---|---|---|
| 1. Conscientiousness | 0.86 | 0.67 | 0.82 |
| 2. Neuroticism | 0.87 | 0.69 | 0.83 |
| 3. Agreeableness | 0.90 | 0.75 | 0.87 |
| 4. Openness | 0.93 | 0.82 | 0.91 |
| 5. Extraversion | 0.88 | 0.71 | 0.84 |
| 6. English learning motivation | 0.93 | 0.80 | 0.89 |
| 7. English achievement | 0.94 | 0.85 | 0.92 |
| 8. Global attitudes | 0.93 | 0.82 | 0.91 |
| 9. Global skills | 0.91 | 0.78 | 0.88 |
| 10. Global knowledge | 0.92 | 0.79 | 0.89 |

hence was included in the research model for further analysis.

### 4.2. The measurement model and common method variance

Prior to evaluating the measurement model, three-item parcels were respectively created for all of the focal variables to reduce model complexity and estimation errors (Little, Cunningham, Shahar, & Widaman, 2002). Following the steps suggested by statistical scholars, we first conducted a series of exploratory factor analysis (EFA) which confirmed the uni-dimensionality of these variables, and then created parcels for each of them using the item-to-construct method (see Little et al., 2002, p. 166).

Overall, the measurement model, including ten latent variables, achieved an acceptable model fit: $\chi^2$ (360, $N$ = 555) = 923.206, $p$ < .001, $\chi^2/df$ = 2.564; SRMR = 0.038; RMSEA = 0.053; CFI = 0.960; TLI = 0.952. All factor loadings were significant at the level of $p$ < .001, ranging from 0.76 to 0.93. Reliability and convergent validity of the measurement model were measured by composite reliability (CR) and average variance extraction (AVE), respectively. According to Bagozzi and Yi (1988), all scales performed well (CR: larger than 0.60; AVE: larger than 0.50), as shown in Table 2. Discriminant validity was assessed by square roots of AVE, and the results indicated that the criterion was fulfilled because all these values were larger than a specific variable's correlations with all other variables (see Tables 1 and 2 for comparison) (Bagozzi & Yi, 1988).

In addition, Harman's single factor test was performed to check common method bias due to the cross-sectional design (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). All 59 items were forced to load on a single un-rotated factor and this single factor extracted only 34.41% of the variance, well below the warning threshold value of 50%. We also evaluated a one-factor model which indicated a very poor model fit: $\chi^2$ (405, $N$ = 555) = 8082.964, $p$ < .001, $\chi^2/df$ = 19.958; SRMR = 0.131; RMSEA = 0.185; CFI = 0.460; TLI = 0.420. These results can show that common method bias was not a problem for the study.

### 4.3. The structural model

The structural model was larger than the measurement model due to including gender (male) and latent interactions between five personality traits and English learning motivation. To create these latent interaction variables, we followed the recommendations of Marsh, Wen, and Hau (2004) by first centering all indicators of these six variables around their own means and then using the matched-pair strategy to form three indicators for each of the five latent interaction terms. Marsh et al. (2004) have demonstrated that the matched-pair strategy can outperform other interaction-constructing approaches in evaluating interacting effects.

An initial test of the structural model revealed an acceptable model fit: $\chi^2$ (898, $N$ = 555) = 2020.315, $p$ < .001, $\chi^2/df$ = 2.250; SRMR = 0.042; RMSEA = 0.047; CFI = 0.947; TLI = 0.938. Nonetheless, modification indices showed that the model fit could be improved if the direct path from the interaction (extraversion × motivation) to global knowledge was added. After it was added, re-testing the model showed an improvement: $\chi^2$ (897,

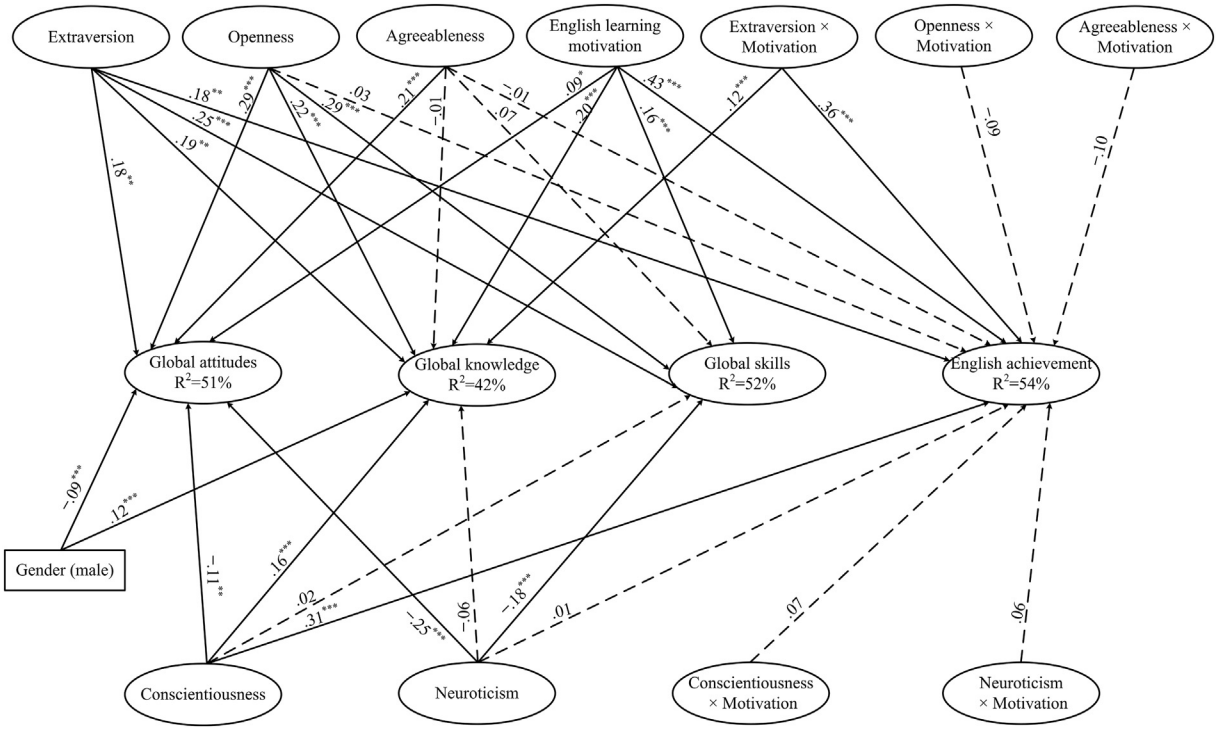


**Fig. 1.** Results of testing the structural model. *$p$ < .05, **$p$ < .01, ***$p$ < .001. Covariances between the exogenous variables and those between the endogenous variables are not shown for parsimony of the model. The solid lines indicate significant standardized coefficient paths; The dotted lines indicate non-significant standardized coefficient paths.

$N = 555$) = 2007.944, $p < .001$, $\chi^2/df = 2.239$; SRMR = 0.039; RMSEA = 0.047; CFI = 0.947; TLI = 0.939. The Chi-square difference test showed a significant difference between the two models: $\Delta\chi^2 = 12.371$, $\Delta df = 1$, $p < .001$.

Standardized path coefficients of the final model are presented in Fig. 1. It needs to be noted that covariances between the exogenous variables and those between the endogenous variables are not shown in the figure for model parsimony. The results indicated that conscientiousness ($\beta = 0.31$, $p < .001$) and extraversion ($\beta = 0.18$, $p = .002$) positively predicted English achievement, while openness ($\beta = 0.03$, $p = .636$), agreeableness ($\beta = -0.01$, $p = .844$) and neuroticism ($\beta = 0.01$, $p = .875$) were non-significant for English achievement. Thus, H1a and H1b were supported, but H1c, H1d and H1e were not supported.

Extraversion positively predicted global skills ($\beta = 0.25$, $p < .001$), global knowledge ($\beta = 0.19$, $p = .002$), and global attitudes ($\beta = 0.18$, $p = .002$). Thus, H2a was supported. Likewise, openness positively predicted global skills ($\beta = 0.29$, $p < .001$), global knowledge ($\beta = 0.22$, $p < .001$), and global attitudes ($\beta = 0.29$, $p < .001$). Thus, H2b was supported. Agreeableness positively predicted global attitudes ($\beta = 0.21$, $p < .001$), but was non-significant for global skills ($\beta = 0.07$, $p = .087$) and global knowledge ($\beta = -0.01$, $p = .834$). Thus, H2c received partial support. Conscientiousness positively predicted global knowledge ($\beta = 0.16$, $p < .001$) and negatively predicted global attitudes ($\beta = -0.11$, $p = .008$), but was non-significant for global skills ($\beta = 0.02$, $p = .580$). Thus, H2d received partial support. Neuroticism negatively predicted global skills ($\beta = -0.18$, $p < .001$) and global attitudes ($\beta = -0.25$, $p < .001$), but was non-significant for global knowledge ($\beta = -0.06$, $p = .146$). Thus, H2e received partial support.

In addition, English learning motivation positively predicted all the outcome variables [English achievement ($\beta = 0.43$, $p < .001$), global skills ($\beta = 0.16$, $p < .001$), global knowledge ($\beta = 0.20$, $p < .001$), and global attitudes ($\beta = 0.09$, $P = .019$)]. Thus, H3a and H3b were supported. Finally, gender (male) negatively predicted global attitudes ($\beta = -0.09$, $p < .001$) and positively predicted global knowledge ($\beta = 0.12$, $p < .001$).

### 4.4. Moderation analysis

Regarding the RQ, the structural model revealed that English learning motivation moderated the relationships of extraversion to English achievement ($\beta = 0.36$, $p < .001$) and global knowledge ($\beta = 0.12$, $p < .001$) (see Fig. 1). To further probe the moderation, simple slope analyses were conducted to respectively examine relationships of extraversion to English achievement and global knowledge at low (one *SD* below the mean) and high (one *SD* above the mean) levels of motivation (Aiken & West, 1991). The result indicated that the positive relationship between extraversion and English achievement was much stronger at high ($t = 7.938$, $p < .001$) than at low levels of motivation ($t = 4.012$, $p < .001$) (see Fig. 2). Similarly, the positive relationship between extraversion and global knowledge was much stronger at high ($t = 11.42$, $p < .001$) than at low levels of motivation ($t = 5.63$, $p < .001$) (see Fig. 3).

## 5. Discussion and implications

The present study examined the Big Five personality traits and their relationships to English achievement and global competence. Furthermore, English learning motivation was revealed to moderate the relationships of extraversion to English achievement and global knowledge. These findings can add insightful knowledge to the literature on individual differences and FL learning.

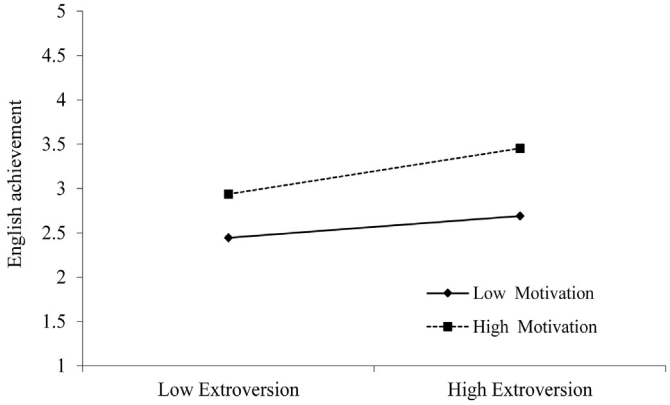


**Fig. 2.** Interaction between extraversion and English learning motivation on English achievement.

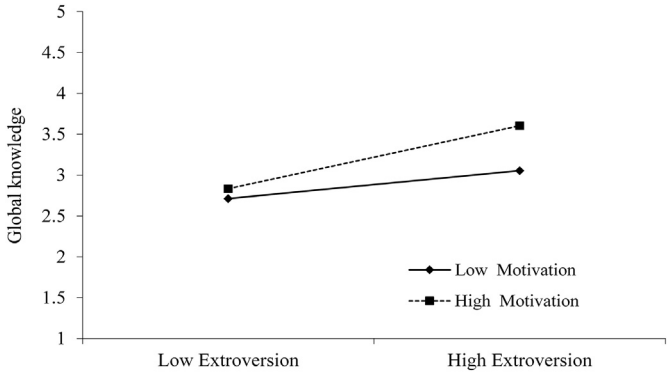


**Fig. 3.** Interaction between extraversion and English learning motivation on global knowledge.

### 5.1. Relationships between personality and English achievement

Of the five personality traits, only conscientiousness and extraversion predicted English achievement. The positive relationship between conscientiousness and overall academic performance has been widely revealed (O'Connor & Paunonen, 2007; Richardson et al., 2012; Vedel, 2014). The beneficial features of conscientiousness (e.g., hard-working, disciplined and perseverant ways of learning) may as well apply to English learning outcomes, which was consistent with prior studies (MacIntyre & Charos, 1996; Zhou, 2015). Success in FL learning, as a structured course for Chinese university students, are highly dependent on their organization, self-regulation, and attention to details.

In higher education, extraversion has been widely discussed in terms of its non-significant or negative relationship with academic performance (e.g., De Feyter et al., 2012; Kappe & van der Flier, 2010; Komarraju et al., 2011). Scholars generally argue that extraverted students are distractible, sociable, and weak in long term memory, thus undermining their academic performance (Furnham et al., 2013). However, we revealed extraversion as a strong positive predictor of English achievement. Although few studies examine the relationship between personality and FL achievement, our finding can obtain support from a prior study (Kao & Craigie, 2014). FL learning is an academic subject that highly requires speaking, communicating, oral presentation, and group work in the target language that are often heavily represented in exams. Extroverts often excel in these aspects (Kappe & van der Flier, 2010), partially because high extraversion is often associated with low FL anxiety (Dewaele, 2002). Further, Kao and Craigie (2014) found that extraverted students used English more often than introverted students, thus contributing to the improvement.

The non-significant relationships of openness and neuroticism to

English achievement were out of our expectations. Openness manifests itself in intellectual curiosity, broad interest, creativity and divergent thinking (Komarraju et al., 2011), and thus was assumed to positively predict FL learning that incorporates exposures of new cultures and peoples. However, according to Wen (2018), pedagogical methods in English teaching in Mainland China are still text-centered and input-based, and only some teachers are experimenting with task-based approaches (e.g., providing cultural exposures and stimulating creative thinking). Therefore, many students high in openness may lack opportunities to exhibit their good qualities in English learning courses. Alternatively, Rosander et al. (2011) argue that openness could facilitate the learning of practical subjects such as art and music, but language learning should imply different properties from those found in openness. Most studies revealed the negative relationship between neuroticism and performance, due to neurotic students' high anxiety in the face of exams and pressures (Kappe & van der Flier, 2010). Noteworthy is that these prior studies overwhelmingly focused on European or North American contexts. The non-significance between neuroticism and English achievement revealed in our study may result from our Chinese educational contexts where performance evaluation is heavily exams-based throughout different educational stages (Yin, Han, & Lu, 2017). Chinese students' rich experiences with exams may largely relieve them from the anxiety. Echoing our result, Zhou (2015) found that emotional stability (conversely neuroticism) was not related to Chinese students' English achievement. In Poropat's (2009) meta-analysis, the relationship between agreeableness and academic performance varied as a function of educational levels. Specifically, this relationship was 0.30 at the primary educational level, whereas it decreased to 0.06 at the higher education level. Kappe and van der Flier (2010) also argue agreeable students may thrive in collaborative academic and/or social settings because they possess good qualities (e.g., friendliness, modesty, and cooperation) in building harmonious interpersonal relationships. The above-mentioned finding and/or argument may be the underlying reason for the non-significance between agreeableness and English achievement, a finding revealed among Chinese undergraduates mainly situated in less collaborative academic contexts.

### 5.2. Relationships between personality and global competence

Our study can contribute to the individual difference and high education research by combining personality traits and global competence. Some studies have examined roles of personality in some intercultural outcomes (e.g., cross-cultural friendships, intergroup attitudes, and adjustment) among immigrants or sojourners (e.g., Turner et al., 2014; Zhang, Mandl, & Wang, 2010). Although these outcome constructs are related to global competence in one way or another, it is necessary to gain a direct and insightful knowledge about the relationship between personality and global competence.

The findings showed that the five personality traits can be related to global competence in different ways. The negative conscientiousness-global attitudes relationship and the positive conscientiousness-global knowledge relationship were interesting and worth discussing. Global knowledge is mainly assessed by knowledge of one's own and foreign cultures and world history. Such knowledge can be gained through relevant structured courses, and as discussed previously, conscientious students may be superior in course learning due to their self-regulated and persistent learning. Despite these desirable profiles, conscientious individuals also hold features of conservatism and traditionalism (Roberts et al., 2005), which may be negatively related to willingness to embrace cultural diversity and readiness to engage in cultural differences (as measured by global attitudes). Of relevance, Stupar et al. (2014) found the negative relationship between conscientiousness and multiculturalism.

The existing literature has revealed importance of the two personality traits of extraversion and openness in intercultural experiences (Turner et al., 2014). Our findings are encouraging because the two traits positively predicted all three dimensions of global competence. High extraversion indicates strong intentions to contact with outgroups and maintain intercultural friendships (Mak & Tran, 2001; Turner et al., 2014), which can positively predict perceived competence in multicultural contexts (Arasaratnam & Banerjee, 2011). Students high in openness to new ideas and experiences may be more likely to embrace cultural diversity and engage in the diversity, as reflected in global attitudes and skills. Bartel-Radic and Giannelloni (2017) also revealed openness as a positive predictor of cross-cultural knowledge.

Qualities manifested in agreeableness include considerateness, friendliness and generosity, which is positively related to one's attitudes towards foreign cultures and peoples (Stürmer et al., 2013). This may partially explain the mechanism underlying the agreeableness-global attitudes relationship. In contrast, neuroticism negatively predicted global attitudes and skills. Neurotic individuals tend to display strong social anxiety and nervousness (De Feyter et al., 2012) that have been widely recognized as negative predictors of willingness for intercultural communication (Stephan, 2014) and effectiveness in intercultural communication (Gudykunst, 2005).

### 5.3. Functional roles of English learning motivation

Our findings suggested that English learning motivation was positively related to English achievement and all dimensions of global competence. The former relationship has been extensively revealed, while the latter one is rather scarcely examined and can be supported by few studies (e.g., Semaan & Yamazaki, 2015). As motivation is often evolved into behavioral practices (Ajzen et al., 2009), English learners with strong motivation tend to seek various opportunities to participate in communities where the target language is used, both directly (e.g., direct contact) and indirectly (e.g., newspaper and entertainment programs in English). The participating behaviors may contribute to better understanding traditions and norms of foreign cultures. Besides, many motivated students view language learning as a stepping stone to another goal, such as preparatory for study abroad and career choices. Possibly, they may apply what they have learned to practical use to reflect their aspirations and needs (Semaan & Yamazaki, 2015), thus further developing their global competence.

Our findings spoke to the complex nature of the moderated relationships of extraversion to English achievement and global knowledge by English learning motivation. Of the two moderated relationships, the one related to global knowledge was a finding not hypothesized in the study. Specifically, the positive extraversion-English achievement and extraversion-global knowledge relationships were stronger at high than at low levels of motivation (see Figs. 2 and 3). In this sense, English learning motivation functioned as complementary rather than compensatory as a moderator, strengthening these relationships. To interpret the moderations, we can seek support from features of extraversion. Although extraversion was revealed as a positive predictor, this personality has some obvious disadvantages in academic learning (e.g., easily distractible and less focused) (Furnham et al., 2013). Academic motivation, however, can help monitor and control learning behaviors (Mega, Ronconi, & De Beni, 2014), thus possibly making extraverted students more focused and concentrated. Therefore, extraversion and motivation may work jointly to help students achieve better performance in learning English and acquiring global knowledge.

### 5.4. Practical implications

Our findings showed huge individual differences in both English achievement and global competence among Chinese university students. It obviously hinted at the importance of continuously monitoring students' personality traits, through class observation, feedback assessment, or evaluation survey. Understanding their personality profiles can help university management, teachers and counselors design

appropriate interventions, incorporate effective strategies into teaching practices, and upgrade service programs.

For instance, many prior studies stress that interactions among culturally diverse students can promote global/multicultural competence (e.g., Jon, 2013). However, for neurotic students who may be low in global skills and attitudes due to high anxiety in intercultural interactions, administers may consider setting situations conductive to lowering their anxiety levels (Liang & Kelsen, 2018). Hence, the integration programs need to be designed wisely, for example, with common goals and interest. Teachers also need to offer more emotional and instrumental support for introverted students to encourage their active participation in speaking and communicating in FL learning. Collaborative learning environment and interesting cultural exposures can be designed to nurture students' qualities of agreeableness and openness (Zhou, 2015). Finally, promoting students' English learning motivation seemed to be critical. Hence, teacher need to seek out diverse and innovative teaching approaches to arouse students' interest in and motivation for language learning and cultural exploration (Wen, 2018).

## 6. Limitations and conclusion

Several limitations of this study have to be acknowledged. First, it required caution to interpret the findings as causal relationships due to the cross-sectional design. For example, higher levels of English achievement may as well predict stronger English learning motivation. Future research is encouraged to conduct longitudinal studies to reveal causal relationships among these variables. Second, the sample were selected from a single university, which may reduce the generalizability of the results. Future research is recommended to address this limitation by collecting data from diverse sources. Third, in our study English learning motivation was a uni-dimensional scale (Yashima et al., 2004). Though this single-factor scale is widely used, the self-determination theory documents that motivation can be divided into intrinsic and extrinsic motivation (Deci & Ryan, 2000). Thus, if our work can develop a bi-dimensional scale of learning motivation and simultaneously examine its intrinsic and extrinsic dimensions, a better understanding of the relationships of motivation to English achievement and global competence may be gained. Finally, some important constructs for academic performance (e.g., self-regulated learning and academic self-efficacy) are ignored in our study. Future research is encouraged to examine their potential interplay with personality traits in predicting FL achievement.

Despite these limitations, this work can contribute insightful knowledge to the literature on individual differences and higher education. First, we detached from the widely examined relationships between personality and overall academic performance, and attempted to delve deeper into this topic by focusing on specific achievement and competence. Our findings revealed that the five personality traits functioned very differently in predicting English achievement and global competence. Second, to the authors' knowledge, the present study was among the first to examine the joint working mechanism of personality and English learning motivation, and revealed moderating roles of the latter construct in the relationships of the extraversion trait to English achievement and global knowledge. The findings can also be helpful for higher education stakeholders to design interventions and upgrade service programs for student development.

## Ethical approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

## Appendix A

*Items for the scale of English learning motivation*

1. Compared to my classmates, I think I study English relatively hard.
2. I often think about the words and ideas that I learn about in my English classes.
3. If English were not taught at school, I would study it on my own.
4. I think I spend fairly long hours studying English.
5. I really try to learn English.
6. After I graduate from college, I will continue to study English and try to improve.

*Items for the scale of global competence*

Global knowledge subscale

1. I hold positive attitudes towards cultural diversity.
2. I recognize that my own worldview is not universal.
3. I am willing to step outside of my own cultures and experience life as “the other”.
4. I am willing to take risks in pursuit of cross-cultural learning and personal development.
5. I take a non-judgmental reaction to cultural difference.

Global skills subscale

1. I am capable to identify cultural differences.
2. I can live comfortably outside my own cultures.
3. I can successfully participate in different sociocultural settings.
4. The extent to which I collaborate effectively across cultures.
5. I can successfully participate in project-oriented activities with people from other cultures.

Global knowledge subscale

1. The extent to which I understand Chinese cultural norms and expectations.
2. The extent to which I understand norms and expectations of cultural others.
3. The extent to which I have a knowledge of current world events.
4. The extent to which I have a knowledge of world history.
5. The extent to which I understand the concept of globalization.

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