A Comparison of Chinese and European–American University Students’ Virtue and Mind Learning Beliefs and Academic Achievement in Global Cultural Exchange

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Abstract: The world’s two largest economies, the United States and China, have fundamentally different cultural beliefs about learning. Thus, when examining Chinese learners, Western researchers were confused by the contrasting phenomenon between seemingly poor learning approaches and high academic achievement, i.e., the Paradox of Chinese Learners. In addressing this paradox, Jin Li offered a theoretical framework of the Chinese virtue model versus the European–American mind model to comprehensively understand the differences in students’ learning beliefs and academic achievement between the two cultures. However, Li does not pay attention to global cultural exchange or directly link learning beliefs to academic achievement. Therefore, this paper presents two empirical studies addressing these research gaps. Study 1 adopted both qualitative and quantitative methods to investigate the learning beliefs of Chinese and European–American university students, and revealed that deepening cultural exchange narrowed the gap between the two models (Study 1a), but the impact of the virtue model on European–American students was weaker than that of the mind model on Chinese students (Study 1b). Study 2 further revealed that both models were beneficial for Chinese students’ academic achievement, whereas only the virtue model benefited European–American students. These findings have important implications for addressing the Paradox of Chinese Learners.

Keywords: cross-cultural comparison; virtue model; mind model; learning beliefs; academic achievement; Chinese students; European–American students; paradox of Chinese learners

1. Introduction
The world has long been widely divided, especially culturally. Although all cultures of the world strive to promote education and learning, which are essential for enhancing the development of individuals, societies, and countries, they have rich, longstanding, and fundamentally different outlooks on learning as a vital part of their respective philosophies.
However, in recent decades, with rapid globalization, the world has undergone tremendous integration-oriented changes with far-reaching impacts on education and learning. Indeed, a global convergence of educational policies, practices, and values has been observed in many countries. Yet, educational borrowing and transfer are not straightforward; there are still cultural variations in learning across social contexts, while the ultimate ends of education (such as intellectual competencies versus moral cultivation) remain contested. Therefore, forming a consensus on best practices in education and learning requires objective and comprehensive frameworks for cross-cultural comparison.

Comparing the approaches to education and learning of the world’s two largest economies, the United States and China, is of great interest in the era of globalization. However, as the two cultures differ considerably in almost every aspect, existing knowledge of this field remained discrete and could only represent separate and fragmented images of the two educational systems. In view of this drawback, Jin Li adopted an anthropological emic perspective and conducted a series of cross-cultural comparative studies focusing on cultural beliefs about learning with the ambitious goal of comprehensively understanding the two education systems from all angles [1] (p. 77). Li argued that cultural beliefs play an imperceptible role in guiding people’s goal setting and motivation and thus better reflect the reasons underlying the observed behavior of the group [2–6].

According to Li, Chinese and European–American people hold fundamentally different beliefs about learning that influence their approach to education owing to two contrasting intellectual traditions. The Chinese intellectual tradition, called the virtue model, stems from Confucian teaching and prioritizes moral and social self-perfection. In contrast, the European–American tradition, called the mind model, originates from Socratic epistemology and aims to cultivate the mind to understand the world [1] (introduction). With this important conceptual distinction between the two cultures, Li uncovered a new path in this field of research, calling for more cross-cultural studies to be conducted within this virtue–mind theoretical framework (e.g., [7–10]).

However, Li’s theory was developed at the turn of the 21st century; over the next 20 years or so, unprecedented cultural exchange bridged the cultural differences that had existed for thousands of years. Is this cultural distinction still as broad today? To answer this question, the first objective of our research was to investigate learning beliefs in today’s China and the United States in the era of globalization to retest Li’s theory.

Second, although Li’s cross-cultural studies helped us better understand the strengths and limitations of the two education systems, these studies lacked an integrated view of how the two cultures can borrow wisdom from each other in the current trend of broadening and deepening cultural merging. In other words, which cultural model is more beneficial for students’ academic achievement between the virtue model and the mind model? Addressing this question is undoubtedly meaningful for educational practices in both cultures.

Therefore, in this paper, we re-examined current differences in learning beliefs and their relationship to academic achievement between Chinese and European–American students under Li’s virtue–mind framework in an attempt to amend or enrich Li’s theory from the perspective of cultural exchange.

2. Literature Review and Theoretical Framework
2.1. Development of the Virtue–Mind Framework

Jin Li’s cross-cultural comparative studies were inspired by the famous Paradox of Chinese Learners. Coined by Watkins and Biggs in 1996 [11], the Paradox of Chinese Learners refers to an unsustainable way of learning among Chinese students who consistently excel in international assessments, such as Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA), compared with European–American students [12–15], but show little intrinsic interest in exploration, independent thinking, and critical thinking [16,17]. Chinese students’ high performance has attracted the attention of researchers seeking to uncover the uniqueness of
Chinese students, teachers, and parents in terms of learning [18–22], organization of school days [23], curriculum [24], pedagogy [16,25,26], and parenting [27–29] (see Section 2.1 in our previous work [30] for a detailed review). Yet, the unsustainability of Chinese education [31], leading to high academic stress [32] and a lack of creativity [33], has also prompted China to seek to emulate Western-style educational practices [23,34–36]. However, the differences in approaches to education and learning between China and the United States identified in the literature are almost ubiquitous, which amounts to traveling on two parallel paths. This has led many scholars to develop broader frameworks of the two intellectual traditions—Confucian and Socratic philosophy [16,29,37–39]. Among them, Li’s virtue–mind framework [40–50] is generally considered the most comprehensive, encouraging future research in the field.

Li’s theory is innovative in that she adopted an anthropological emic perspective to identify the fundamental beliefs behind the perceived differences in the Chinese and American education systems. Specifically, Li used a prototype method, which is an empirical method based on the idea that humans categorize objects and experience events according to their understanding of the world with the aid of language by naming and labeling these objects and events. By analyzing these names and labels, i.e., conceptualized prototypes, Li was able to identify the cultural foundations of education and learning in China and the United States [1] (pp. 77–78).

In the two studies she conducted to compare Chinese and European–American learning models [40,41], she asked native university students from each culture to provide free associations of the Chinese term “xuexi (学习)” or its English synonym “learn/learning”, and then used cluster analysis to map the relationships between the various associative concepts in each culture. The results revealed striking differences in learning vocabulary between the two groups.

In terms of readily observable purely linguistic features (see Tables 3.1 and 3.2 in [1] for the 20 highest rated items in each culture and their characteristic differences (pp. 79–81)), the Chinese associative words typically included idioms and expressed strong affect and a strong call to action, such as “read extensively (博览群书)”; “there is no boundary to learning (学无止境)”; “keep on learning as long as you live (活到老, 学到老)”; “learning without thought is labor lost; thought without learning is perilous (学而不思则罔, 思而不学则殆)”; “long-term diligence is the road to the pinnacle of knowledge; endurance of hardship is the boat to the boundless sea of learning (书山有路勤为径, 学海无涯苦作舟)”. However, the English associative words were mostly single, common words that did not convey desire, passion, or intensity, such as “knowledge”, “thinking”, “students”, “teacher”, and “library”.

In terms of conceptual features (see Figures 3.1 and 3.2 and Tables 3.2 and 3.3 in [1] (pp. 81–86)), the Chinese vocabulary list contained a large proportion of learning virtues, such as diligence, endurance of hardship, steadfast perseverance, concentration, humility, and lifelong learning. In stark contrast, among the nearly 500 English words, there was no reference to hard work. However, 30% of the terms included in the English vocabulary list were related to thinking and other mental processes or characteristics (e.g., intelligence, inquiry, logic, analysis), which only accounted for 6% in the Chinese vocabulary list. In addition, the English terms primarily referred to external factors such as resources, institutions, and teachers, which was only the case for the lowest rated Chinese items. Moreover, the Chinese concepts focused on unique learning purposes such as moral and social self-perfection, improved social status, and contribution to society.

Converging the above findings, Li discussed the similarities and differences between the Chinese virtue model and the European–American mind model while separately highlighting their correspondence with Confucian and Socratic epistemological lineages. This allowed her to examine in greater detail each culture’s learning processes, learning affect, relationships between learning peers, knowledge expression, and parental guidance through a number of follow-up studies.
The underlying assumption of Li’s studies was that culture exerts a strong influence on people’s fundamental beliefs about learning, thereby shaping their educational and learning behaviors. Li’s ambitious objective of establishing a comprehensive theoretical framework and her extensive empirical efforts are undoubtedly admirable. However, when it comes to the discussion of the influence of cultural exchange on education and learning, she failed to follow through on the same hypothesis consistently. For example, she argued that “variations remain despite deepening cultural exchange” [1] (p. 331), that “the basic patterns of cultural learning models are tenacious and unlikely to melt in grand unification” [1] (p. 332), and that “despite today’s accelerated cultural exchange, these learning models do not diminish but endure” [1] (introduction). How can a country’s cultural tradition affect education and learning, but cultural exchange cannot? It should be noted that Li’s theory was developed around 20 years ago, when global cultural exchange was not as intense as it is today. In addition, the effect of cultural exchange on beliefs about education and learning has not been empirically studied, a research gap that underlies our previous research and this paper.

Moreover, to better address the Paradox of Chinese Learners and improve the sustainability of Chinese education, research should not merely focus on a phenomenological explanation of the distinction between the two cultural learning models, but should examine the relationship between their respective learning beliefs and students’ academic achievement. In Li’s subsequent studies [49,50], she bridged the missing link between learning beliefs and academic achievement. However, the results from these studies are insufficient and not comparative in nature to determine which model is best for students’ academic achievement. We address this problem in this paper.

2.2. Introduction of Our Previous Work

In an effort to explore the effect of cultural exchange on learning beliefs, we recently conducted a large-scale survey in China to replicate Li’s studies [40,41] with the necessary amendments to her word association test. We recruited 2326 Chinese students ranging from Grade 1 in primary school to juniors in university, coded 32,202 learning associative terms according to Li’s virtue–mind framework, and counted the percentages of virtue and mind word categories. The results revealed a changing trend, from the dominance of the virtue model in primary school to a balance between the virtue and mind models in university; that is, although the tradition of the virtue model among Chinese students was maintained to a large extent, as they grew older, the components of the mind model steadily increased in their learning beliefs to the point of outnumbering those of the virtue model, indicating that learning beliefs are not immutable but grow with a learner’s educational experiences [30]. The consistent Westernization of Chinese students’ learning beliefs was so prominent that it could be observed simply by looking at the linguistic features of the proposed associative terms (see Table 1 in [30]). In the discussion, we attributed this finding to the fact that education in China has changed as a result of cultural exchange, from its system to curriculum content, which Li also recognized [1] (pp. 63–64). We further suggested a narrowing or disappearance of the gap between the virtue and mind models in the future, and proposed a sustainable learning model dynamically balancing virtue and mind for Chinese education [30].

In our qualitative study [30] based on manual coding of associative words in line with Li’s framework, we remapped the hierarchical structure of Chinese students’ learning concepts and integrated both virtue and mind orientations into a diagram (see Figure 1) as a more appropriate analytical alternative in the era of cultural exchange. As most associative terms were positive or neutral, negative terms that reflected undesirable aspects of learning were exclusive of one orientation or the other. In both orientations, we found four common aspects: (1) learning motivation, (2) learning ability and attitude, (3) learning strategy and support, and (4) learning content. However, their respective dimensions were significantly different.
Table 1. The 20 learning associative words with the highest frequency in the two cultures (frequencies are in brackets).

| Chinese                  | Chinese (老师) (135) | Knowledge (90) |
|-------------------------|----------------------|----------------|
| Chinese                  | Examination (考试) (132) | School (78) |
| Chinese                  | Schoolwork (作业) (106) | Study (70) |
| Chinese                  | Library (图书馆) (87) | Education (62) |
| Chinese                  | Hard work (努力) (80) | Book (52) |
| Chinese                  | Grade (成绩) (75) | Read (43) |
| Chinese                  | Review (复习) (73) | Teacher (42) |
| Chinese                  | Mathematics (数学) (69) | Skill (37) |
| Chinese                  | English (英语) (61) | Teach (36) |
| Chinese                  | School (学校) (61) | College (31) |
| Chinese                  | Knowledge (知识) (61) | Smart (30) |
| Chinese                  | Attend lesson (上课) (55) | Intelligence (30) |
| Chinese                  | Diligence (勤奋) (55) | Information (25) |
| Chinese                  | Straight-A student (学霸) (52) | Class (22) |
| Chinese                  | Classmate (同学) (50) | Work (22) |
| Chinese                  | Student (学生) (49) | Understand (22) |
| Chinese                  | Chinese (语文) (48) | Test (20) |
| Chinese                  | Earnestness (认真) (46) | Write (19) |
| Chinese                  | Physics (物理) (44) | Homework (15) |
| Chinese                  | Perseverance (坚持) (44) | Classroom (12) |

For example, for learning motivation, the virtue model pointed inward and focused on the self (i.e., perfection of oneself morally/socially; depth and breadth of knowledge; promotion of social status; and contribution to society), reflecting the exemplary path of growth envisioned by Confucius, that is, “cultivate self, regulate family, order the state, and bring peace to the world (修身，齐家，治国，平天下)”. In contrast, the mind model pointed outward and focused on the world, aiming to explore, understand, and face the world through the development of one’s abilities or skills. In addition, as Li also pointed out [1] (p. 159), the mind model emphasized the need for learners to receive constant external affirmation to maintain their learning motivation, such as praise and rewards.

For learning ability and attitude, the virtue model focused specifically on learning virtues or attitudes including love and passion, diligence, cherishing time, perseverance and endurance of hardship, concentration, humility, and lifelong pursuit. In contrast, the mind model only paid attention to one attitude (i.e., active engagement), but focused on cognitive ability, which was not involved in the virtue model.

For learning strategy and support, the virtue model was limited to only one approach (i.e., practice and review) because Confucian learners view long-term repeated practice as the only way to achieve mastery of knowledge and as inseparable from diligence, endurance of hardship, perseverance, and other learning virtues. In contrast, the mind model was rich in this category, comprising learning and self-management plan, learning approaches, exploration and experiment, thinking and comprehension, and cooperation and communication, all of which reflect learners’ agentic process of active engagement in learning. In addition, this model included many neutral terms representing external support for learning, such as teaching methods, learning experiences and environment, resources, facilities, and tools for learning, and life processes and stages.
In our qualitative study [30] based on manual coding of associative words in line with Li’s framework, we remapped the hierarchical structure of Chinese students’ learning concepts and integrated both virtue and mind orientations into a diagram (see Figure 1) as a more appropriate analytical alternative in the era of cultural exchange. As most associative terms were positive or neutral, negative terms that reflected undesirable aspects of learning were exclusive of one orientation or the other. In both orientations, we found four common aspects: (1) learning motivation, (2) learning ability and attitude, (3) learning strategy and support, and (4) learning content. However, their respective dimensions were significantly different.

Figure 1. The integrated hierarchical structure of Chinese students’ virtue and mind learning beliefs in the age of cultural exchange. The categories were formed by classifying associative terms with the corresponding meaning. The categories marked with an “*” were all quoted directly from Li [40,41], and the rest were identified by the coders with reference to Li’s other study [1].

Finally, for learning content, the virtue model focused on moral education (i.e., daily code of conduct), whereas the mind model focused on intellectual education (i.e., school curriculum and basic knowledge).

As counting the percentages of virtue and mind associative terms may lead to biased results, that is, it may not clearly ascribe the Westernization of learning beliefs to a decline in virtue concepts or an increase in mind concepts, or a combination of both, we adopted a novel quantitative method [30]. Specifically, we developed a concept correlation rating scale to measure the extent to which the participants held virtue and mind learning beliefs and revealed that the virtue and mind models were both conducive to academic achievement and that neither should be neglected, thereby addressing the Paradox of Chinese Learners to some extent.

However, although our work [30] contributed to amend and enrich Li’s theory, it inevitably had limitations. The main limitation was that the studies were conducted in China only, so the situation of European–American students’ learning beliefs in the age of cultural exchange remains unclear. In addition, because of its cross-sectional nature, the results for this study are insufficient to draw conclusions about the role of cultural exchange. Moreover, as the literature [16–29] has identified different factors influencing learning achievement between Eastern and Western cultures, research conclusions drawn from a Chinese sample cannot be generalized to a Western sample.

2.3. Overall Design of the Current Research

Hence, in this paper, we present two sets of studies to reinforce the conclusions of our previous work regarding the influence of cultural exchange and the relationship between cultural learning beliefs and academic achievement.

Specifically, Study 1 investigated the learning beliefs of Chinese and European–American university students to determine whether the distinction between the virtue and mind models
today was as broad as that discovered in Li’s works 20 years ago; Study 1a replicated Li’s word association test [40,41], while Study 1b used the concept correlation rating scale developed in our previous research [30] to check the robustness of the findings of Study 1a. We expected to see that the gap between the two models in each country was narrowing even to the point of elimination due to global cultural exchange.

Study 2 further explored the relationships between the virtue and mind learning beliefs and academic achievement of Chinese and European–American students separately. We assumed that both models of learning beliefs were conducive to students’ academic achievement in the two countries.

3. Study 1: Virtue and Mind Learning Beliefs of Chinese and European–American University Students

3.1. Study 1a: A Qualitative Study

To replicate Li’s findings [40,41] in today’s deepening cultural exchange, in Study 1a, we modified her word association test [40,41]. In her studies [40,41], she first invited three university students from each culture to write down as many common words and phrases as possible denoting aspects of learning. She then recruited another 20 university students with similar backgrounds from each culture to add new items. Next, she asked another 60 participants from each culture to rate the proposed terms on a 4-point scale (i.e., 1 = “not correlated at all” to 4 = “highly correlated”) according to their relationship to learning, and eventually selected all core terms with scores above 2.72—225 items for the Chinese list and 203 items for the English list [1] (p. 79). We argued that a sample of 23 participants from each culture and 428 learning associative terms were not enough to reflect the full picture of cultural beliefs about learning, especially when Eastern and Western cultural learning beliefs blend together in the era of global cultural exchange. Therefore, our word association test was conducted on a much larger scale, and we processed all of the learning terms without selecting the core terms. We first conducted our study with the Chinese sample [30] and replicated it with the European–American sample.

3.1.1. Participants

We recruited Chinese and European–American undergraduate students from Wenjuanxing (https://www.wjx.cn/, accessed on 20 August 2021) and Credamo (https://www.credamo.com/, accessed on 20 August 2021), respectively, two online questionnaire survey platforms resembling Amazon’s Mechanical Turk that offer high-quality sample collection services. The effective Chinese sample consisted of 463 participants (see [30] for demographic details and participant recruitment). For the European–American sample, 254 individuals voluntarily participated in this study via Credamo for monetary compensation. After being ensured that their information would remain confidential, the participants had consented to report their ethnic and educational background, while Credamo recorded their IP address, location, and questionnaire completion duration. After deleting the participants who failed to follow the instruction, who spent too little time completing the questionnaire, and whose background did not meet our requirements, data were analyzed with remaining 220 individuals (111 women, $M_{\text{age}} = 21.24$, $SD_{\text{age}} = 1.00$, 91 liberal art students and 129 science and engineering students).

3.1.2. Methods

The participants in both samples were asked to provide free associations of relevant words, phrases, idioms, or proverbs that came to mind when they saw the target word “xuexi (学习)” or “learn/learning”. After removing several terms unrelated to learning, two lists of 8394 Chinese items [30] and 1966 English items were retained for formal analysis. As we conducted our analysis with the Chinese sample first [30] and established an integrated hierarchical structure of Chinese students’ virtue and mind learning beliefs (see Figure 1), we used the same framework to code the English terms.
Two coders in the authorship who were familiar with the virtue–mind framework used NVivo 11.0 to classify the formally retained English associative terms into one of the 33 learning concept categories in Figure 1 to increase the frequency of occurrence of the corresponding category. Holsti’s intercoder reliability was 0.87 (Holsti’s intercoder reliability was computed by the formula: \( R = \frac{2M}{N_1 + N_2} \), where \( M \) represented the number of coding decisions on which the two coders were in agreement, and \( N_1 \) and \( N_2 \) referred to the number of coding decisions made by the two coders, respectively). Then, we separately summed the total frequency of Chinese and English associative terms in the virtue and mind categories and divided it by the total number of associative words in each culture (8394 Chinese items and 1966 English items) to obtain the frequency of occurrence of the virtue and mind learning concepts in the two cultures.

Next, we used chi-square tests to determine whether there was a significant difference between the proportions of virtue and mind learning beliefs within and between each culture.

### 3.1.3. Results

Table 1 presents the 20 associative terms with the highest frequency in the two cultures. In terms of linguistic features, there was no clear difference between Chinese and English items, which were all single, common words that did not express strong emotions or embody a strong incentive for behavioral performance. However, in terms of conceptual features, some of the Chinese terms conveyed learning virtues such as “hard work”, “diligence”, “earnestness”, and “perseverance” that the English terms did not. The English list also included some terms referring to mental processes and characteristics such as “smart”, “intelligence”, and “understand” that were not included in the Chinese list. Finally, both lists referred to external learning factors such as institutions (e.g., “school”, “college”) and “teacher”. Overall, the top 20 Chinese and English learning associative words revealed a pattern different from that of Li’s studies [40,41] conducted 20 years ago. These results indicated that although the two cultures still have some of their distinct identities, the distinction between virtue and mind learning beliefs is narrowing as Chinese learning beliefs are heavily influenced by the West, demonstrating the role of global cultural exchange.

Table 2 reports the final coding results for the Chinese and English associative terms according to our framework (Figure 1), i.e., the frequency of occurrence of the virtue and mind categories in the two cultures. For the Chinese sample, the proportion of virtue learning beliefs (33.25%) was almost the same as the proportion of mind learning beliefs (48.86%) (chi-square goodness-of-fit test with an expected ratio of 1:1, \( \chi^2 = 0.030, p = 0.863 \)). For the European–American sample, the difference between the proportion of virtue learning beliefs (11.24%) and that of mind learning beliefs (82.45%) was large but not significant (chi-square goodness-of-fit test, \( \chi^2 = 0.541, p = 0.462 \)). These results revealed that in today’s Eastern and Western cultures, people hold similar learning beliefs, which refutes Li’s conclusion regarding the persistence of distinct cultural learning models and confirms the role of global cultural exchange. Comparing the Chinese and European–American participants, the significant result (\( p < 0.001 \)) of Fisher’s exact test revealed a persistent difference in virtue and mind learning beliefs between the two cultures. The Chinese participants had more virtue learning beliefs, whereas the European–American participants had more mind learning beliefs, indicating that the two cultures still retain some of their distinct identities in today’s accelerated cultural exchange.
Table 2. Frequency of occurrence of the virtue and mind categories in the two cultures.

| Category                                           | Chinese (%) | European–American (%) |
|----------------------------------------------------|-------------|------------------------|
| **Virtue Model**                                   |             |                        |
| Learning motivation                                | 33.25       | 11.24                  |
| Perfection of oneself morally/socially            | 3.53        | 3.56                   |
| Depth and breadth of knowledge                     | 3.88        | 2.09                   |
| Promotion of social status                         | 1.64        | 0.25                   |
| Contribution to society                            | 0.33        | 0.00                   |
| **Learning ability and attitude**                  |             |                        |
| Love and passion                                   | 2.07        | 1.73                   |
| Diligence                                          | 6.24        | 0.71                   |
| Cherishing time                                    | 1.74        | 0.41                   |
| Perseverance and endurance of hardship             | 2.70        | 0.36                   |
| Concentration                                      | 2.30        | 0.76                   |
| Humility                                           | 2.70        | 0.05                   |
| Lifelong pursuit                                   | 2.03        | 0.81                   |
| **Learning strategy and support**                  |             |                        |
| Practice and review                                | 3.79        | 0.51                   |
| Daily code of conduct                              | 0.30        | 0.00                   |
| **Mind Model**                                     |             |                        |
| Learning motivation                                | 48.86       | 82.45                  |
| Development of one's abilities/skills              | 4.54        | 12.16                  |
| External motivation, e.g., praise and rewards      | 2.29        | 8.29                   |
| **Learning ability and attitude**                  |             |                        |
| Active engagement                                  | 2.95        | 4.78                   |
| Cognitive ability                                  | 1.43        | 6.51                   |
| **Learning strategy and support**                  |             |                        |
| Learning and self-management plan                  | 3.79        | 0.31                   |
| Learning approaches                                | 3.30        | 8.49                   |
| Exploration and experiment                         | 1.87        | 8.85                   |
| Thinking and comprehension                         | 2.22        | 5.60                   |
| Cooperation and communication                      | 2.55        | 1.42                   |
| Teaching methods                                   | 3.51        | 7.32                   |
| Learning experiences and environment               | 4.07        | 10.43                  |
| Resources, facilities, and tools for learning      | 6.45        | 6.26                   |
| Life processes and stages                          | 4.29        | 3.41                   |
| **Learning content**                              | 7.59        | 6.92                   |
| School curriculum and basic knowledge              | 7.59        | 6.92                   |

3.1.4. Discussion

By replicating Li’s word association test [40,41] 20 years later, Study 1a showed that the distinction between the Eastern virtue model and the Western mind model of learning is constantly narrowing due to global cultural exchange, which is in line with our previous finding regarding the Westernization of learning beliefs among Chinese students today [30]. In addition, the results challenged Li’s conclusions that “variations remain despite deepening cultural exchange” [1] (p. 331), that “the basic patterns of cultural learning models are tenacious and unlikely to melt in grand unification” [1] (p. 332), and that “despite today’s accelerated cultural exchange, these learning models do not diminish but endure” [1] (introduction). However, the extent to which Chinese and European–American students are involved in this “grand unification” may differ. As Li and her colleagues continued their studies throughout these 20 years, they should have noted this narrowing gap. One possible reason for their failure to obtain this important finding may be that the Western world has been relatively less influenced by Chinese culture, whereas Chinese people have actively embraced Western culture for various reasons, such as China’s reform and opening up. To further investigate this problem, a more accurate measure of the extent to which
virtue and mind learning beliefs are embedded in a person’s mind is needed; hence, we conducted the following quantitative study.

3.2. Study 1b: A Quantitative Study

Replicating Li’s qualitative studies [40,41], Study 1a confirmed our assumption that 20 years of cultural exchange have narrowed the gap between the virtue and mind models of learning, revisiting Li’s standpoint of enduring cultural variations. However, the word association test we used in Study 1a could not accurately evaluate the extent to which a person possesses virtue or mind learning beliefs. Therefore, in Study 1b, we adopted a quantitative method using our self-developed concept correlation rating scale [30] to further verify the results for Study 1a.

3.2.1. Participants

Following the similar participant recruitment process and standards as Study 1a, we recruited a valid sample of 210 Chinese undergraduate students and a valid sample of 236 European–American undergraduate students from Wenjuanxing and Credamo, respectively, and their basic information is shown in Table 3.

Table 3. Basic information of Study 1b participants.

|                | Chinese | | European–American | |
|----------------|---------|---|-------------------|---|
|                | N      | % | N                | % |
| Gender         |        |   |                  |   |
| Male           | 48     | 22.9 | 119              | 50.4 |
| Female         | 162    | 77.1 | 117              | 49.6 |
| Type of major  |        |   |                  |   |
| Science and engineering | 119 | 56.7 | 136 | 57.6 |
| Liberal arts   | 91     | 43.3 | 100              | 42.4 |
| Grade          |        |   |                  |   |
| Freshman       | 68     | 32.4 | 23               | 9.7 |
| Sophomore      | 50     | 23.8 | 42               | 17.8 |
| Junior         | 78     | 37.1 | 62               | 26.3 |
| Senior         | 14     | 6.7  | 109              | 46.2 |
| Total          | 210    | 100 | 236              | 100 |

3.2.2. Methods

In our previous study [30], eight experts familiar with Li’s virtue–mind framework selected the following 20 typical learning-related concepts (10 for each model): “diligence (勤 奋)”, “earnestness (认真)”, “endurance of hardship (刻苦)”, “perseverance (坚持)”, “concentration (专注)”, “carefulness (细致)”, “cherishing time (惜时)”, “proficiency (熟练)”, “recitation (背诵)”, and “ambition (志向)” for the virtue model; “intelligence (智力)”, “talent (天赋)”, “smartness (聪明)”, “thinking (思维)”, “comprehension (理解)”, “exploration (探索)”, “discovery (发现)”, “discussion (讨论)”, “innovation (创新)”, and “interest (兴趣)” for the mind model. In Study 1b, each participant was asked to rate the correlation between the 20 selected concepts and “learning (学习)” on a 7-point Likert scale with 7 points indicating highest correlation with learning (see Table A1 in the Appendix A). Then, for each participant, we calculated the mean score of the 10 concepts for the corresponding virtue or mind learning model. Cronbach’s $\alpha$ for the virtue and mind models was 0.903 and 0.893, respectively. Next, we conducted t-tests to determine whether there were significant differences in virtue and mind learning beliefs between Chinese and European–American university students.

3.2.3. Results

Table 4 presents the differences in virtue and mind learning beliefs between the Chinese and European–American participants. The Chinese participants had significantly more learning beliefs related to the virtue model than the mind model, whereas the European–American participants had significantly more mind learning beliefs than virtue
learning beliefs. This result showed the persistence of the learning traditions with the two cultures to some extent. The virtue learning beliefs of the Chinese participants were significantly stronger than those of the European–American participants. However, the mind learning beliefs of the Chinese and European–American participants were almost the same, which could indicate that Chinese people are more subject to the influence of cultural exchange and actively absorb the wisdom of the Western mind learning model. Overall, these results confirmed the findings of Study 1a and our previous study [30], enriching our knowledge of the differential effects of cultural exchange on people from different cultures.

Table 4. Differences in virtue and mind learning beliefs between Chinese and European–American university students.

|                  | M (SD) for the Virtue Model | M (SD) for the Mind Model | t-Test |
|------------------|-----------------------------|--------------------------|--------|
| Chinese          | 5.78 (±1.00)                | 5.58 (±1.00)             | t = 4.46 *** |
| European–American| 5.25 (±1.02)                | 5.53 (±0.97)             | t = −6.60 *** |
| t-test           |                             |                          | t = 5.46 *** |

*** p < 0.001.

3.2.4. Discussion

Study 1b adopted a quantitative method to confirm the findings of Study 1a and reveal the differential extends to which the Chinese and the European–American students were affected by the other culture. Compared with the Chinese students who had nearly the same degree of the mind learning beliefs as their Western counterparts did, the European–American participants had fewer virtue learning beliefs than their Chinese counterparts, which confirmed our assumption. According to these results, it is no wonder that Li and her colleagues missed the important finding of the constantly narrowing gap between the virtue model and the mind model of learning as a result of accelerated cultural exchange. One reason may be that living and working in the United States, Li and her colleagues are surrounded by people who cling to their cultural identity and are less subject to foreign values, so the learning tradition that they perceive remains unchanged. Another reason may be the lack of quantitative methods to estimate the proportion of students’ virtue and mind learning beliefs, leading to ambiguous cross-cultural results in the era of global cultural exchange.

While Studies 1a and 1b demonstrated the role of cultural exchange in bridging the gap between the virtue model and the mind model of learning, the following question arises: Which model is better for students? Is it a good thing for Chinese people to actively embrace the Western mind model of learning? Is it a bad thing for European–American people to stick to their intellectual tradition? Answering these questions will contribute to addressing the Paradox of Chinese Learners, forming a comprehensive understanding of learning, and providing clear insights into learning from a cultural perspective.

4. Study 2: The Relationship between Virtue and Mind Learning Beliefs and Academic Achievement

While Study 1 revisited Li’s virtue–mind framework in the era of deepening cultural exchange, Study 2 further examined the relationship between students’ virtue and mind learning beliefs and their academic achievement to address the Paradox of Chinese Learners. Therefore, Study 2 divided the participants of Study 1b into two groups (i.e., high and low achievers) according to their universities to determine whether there was a significant difference in correlation scores for virtue and mind learning beliefs between the two groups.

4.1. Participants and Methods

For the 210 Chinese participants in Study 1b, we divided them into two academic achievement groups based on the university quality criterion verified in our previous work [30]. Those who studied at 985/211 universities (key universities in China) were classified as high achievers (107 participants, accounting for 50.95% of the Chinese sample); the remaining 103 participants (49.05% of the sample) who studied at Type II or III universities or technical
and vocational colleges were classified as low achievers. We chose this criterion because China’s college entrance examination is a screening process for outstanding students; the top students go to 985/211 universities, while those with poor academic performance go to Type II or III universities or technical and vocational colleges.

Similarly, as the positive relationship between students’ academic performance and their choice of university in the United States was verified by Strayer [51], we divided the 236 European–American participants in Study 1b into two academic achievement groups according to the 2021 Best College Rankings issued by U.S. News & World Report (https://www.compassedu.hk/usnews_2021, accessed on 22 August 2021). The students whose university ranked in the top 150 were classified as high achievers (138 participants, accounting for 58.47% of the European–American sample); the remaining 98 students (41.53% of the sample) were classified as low achievers.

Next, we performed t-tests to compare the correlation scores of virtue and mind learning beliefs between the two groups in each culture; if the results showed a statistically significant difference, it meant that the corresponding learning beliefs had an impact on academic achievement.

### 4.2. Results

Table 5 presents the results for the difference in virtue and mind learning beliefs between high and low achievers in the two cultures. For the Chinese sample, the high achievers scored significantly higher on both virtue and mind learning beliefs. However, for the European–American sample, academic achievement significantly correlated with their virtue learning beliefs but not with their mind learning beliefs. These results indicated that the two learning models played different roles in affecting academic achievement in the two cultures and that the virtue model played a more important role in learning than expected, especially for European–American students.

**Table 5.** The difference in virtue and mind learning beliefs between high and low achievers in the two cultures.

| Culture          | Learning Beliefs | M (SD) for High Achievers | M (SD) for Low Achievers | t-Test |
|------------------|------------------|----------------------------|--------------------------|--------|
|                  | Virtue model     | 6.02 (±0.64)              | 5.52 (±1.22)             | t = 3.70 *** |
|                  | Mind model       | 5.77 (±0.75)              | 5.37 (±1.81)             | t = 2.94 ** |
| Chinese          | Virtue model     | 5.37 (±1.04)              | 5.08 (±0.99)             | t = 2.18 *  |
|                  | Mind model       | 5.56 (±1.00)              | 5.49 (±0.93)             | t = 0.55 |

* p < 0.05, ** p < 0.01, *** p < 0.001.

### 4.3. Discussion

Following the finding of Study 1b, that in today’s cultural blending, European–American students are hardly influenced by the Eastern virtue model, whereas Chinese students have integrated the concepts of the Western mind model into their epistemological beliefs about learning, we investigated the following question in Study 2: Is it beneficial for both cultures to learn from each other? The results from Study 2 showed that the answer to this question was positive. For the Chinese participants, both virtue and mind learning beliefs played an important role in their academic achievement, supporting China’s modern educational reform based on the merits of Western mind learning culture [34–36]. For the European–American participants, their existing mind learning beliefs played a limited role in their academic achievement, whereas their few virtue learning beliefs had a significant effect on their achievement. This finding has important implications for directly addressing the Paradox of Chinese Learners. The reason for Western students’ poorer performance in large-scale international exams relative to Eastern students, despite more favorable educational conditions, may be their lack of important learning virtues such as assiduity and perseverance, which provide learners with psychological resilience to overcome difficulties on the path to academic excellence [52]. In addition, this finding indicates that Western scholars may have been baffled by such a seemingly paradoxical phenomenon because of their failure to adopt an open and positive attitude to understand
the Chinese virtue model and to objectively recognize its strengths. Today, with Western educational researchers gradually acknowledging the advantages of the Eastern virtue learning model [53] and Chinese scholars making great efforts to develop educational concepts with Chinese characteristics that can be communicated to the West [54], the results from Study 2 contribute to the literature by highlighting the importance of the Eastern virtue model under Li’s virtue–mind theoretical framework.

5. Conclusions and General Discussion

Drawing from Jin Li’s virtue–mind theoretical framework, this paper presents two cross-cultural comparative studies on the learning beliefs and academic achievement of Chinese and European–American university students. Study 1 revealed that the gap between the Eastern virtue model and the Western mind model has narrowed as a result of global cultural exchange (Study 1a), but the impact of the virtue model on European–American students is lower than that of the mind model on Chinese students (Study 1b). These findings alter Li’s view of the persistence of differences between the two models despite today’s accelerated cultural merging. The results from Study 2 enrich Li’s theory of the relationship between cultural beliefs about learning and academic achievement by revealing that it is beneficial for China to learn from the Western mind model, because the virtue and mind models both contribute to Chinese students’ learning achievement. However, it is unfortunate that the United States pays little attention to the merits of the Eastern virtue model, as our results showed that this model plays a more important role in European–American students’ academic achievement than the mind model. This paper provides a comprehensive understanding and clear insights into the well-known Paradox of Chinese Learners from a cultural perspective.

Western educational researchers have long been puzzled that Chinese students generally outperform their Western counterparts in mathematics and science in international assessments such as TIMSS and PISA, despite China’s large class sizes, authoritarian and indoctrinating style of teaching, relentless normative testing, and obedient classroom climate, which are not conducive to optimal learning by Western standards [11]. Although education in China has been discussed from various angles, Li was the first to analyze the starting point or ultimate goal of learning in China, identifying China’s pursuit of self-perfection rooted in the Confucian tradition as its distinguishing feature, in contrast to the Western tradition focused on understanding the external world (see Sections 2.1 and 2.2 in our previous work [30] for a systematic review). Li attributed the success of Chinese learners to their learning virtues (e.g., sincerity, diligence, endurance of hardship, perseverance, concentration, respect for teachers, humility) derived from Confucian moral principles and providing them with constant agency [1] (pp. 49–52). As vividly shown by the three-episode BBC documentary Are Our Kids Tough Enough: Chinese Schools [55], British children were much less self-disciplined, less serious about learning, and less resilient to learning setbacks than the Chinese teachers expected, owing to a lack of concerted effort on the part of their parents, teachers, and society to foster these learning virtues. When the Chinese teachers conducted the teaching experiment, although the British students had a difficult time adapting to their Chinese teaching approaches, their test scores were clearly higher than those of the control group taught by British teachers, demonstrating the importance of the Chinese virtue learning model. These findings also echo the “grit” and “growth mindset” movement in American education that aims to cultivate a desirable personality in students consisting of self-motivation, self-discipline, and self-adjustment that continuously generates passion and perseverance for long-term goals and a desirable mindset that can best encourage achievement after failure by regarding ability as malleable, attributing success to hard work, enjoying challenges, and generating strategies for improvement [56–61].

However, focusing on the virtue model of learning alone is not without drawbacks. As shown in our previous studies [30,52], neglecting the mind model is an unsustainable learning approach that threatens students’ mental health [32,62] and hinders creativity,
which can partly explain Needham’s observation of technological backwardness in modern China [63]. Therefore, in the era of globalization, China has implemented various educational reforms to emulate the practices of the Western mind model, which can better equip students with independent and critical thinking, communication and cooperation, and exploration and innovation. These reforms have fundamentally and positively changed education in China, including the entire education system, curriculum content [34–36], and the very epistemological beliefs about learning, as revealed by our study. In comparison, education in the United States remains complacent and does not learn much from China. In the future, as the acceleration of global cultural exchange will no doubt further narrow the gap between the two models, a balance between virtue and mind should be achieved through mutual emulation between the East and the West. Only learners with both high intellectual competencies and psychological resilience can achieve optimal academic success.

6. Limitations and Future Research

There are inevitably some limitations in our studies. For one, the specific mechanism by which cultural learning beliefs influence academic achievement remains unclear. Although our studies demonstrated the different effects of virtue and mind learning beliefs on academic achievement, the mediation between them has not been studied. Recently, Li and her colleagues found that the effect of children’s virtue-oriented beliefs on academic achievement was mediated by academic self-regulation, which bridged the link between learning virtues and grit personality [49], but the mediation of mind-oriented beliefs has not been examined. For future research, experiments that explore causality can also be conducted by priming children’s virtue or mind learning beliefs to induce changes in their task performance. A typical example of priming beliefs is that Dweck and her colleagues found, in laboratory studies, that effort praise or process praise encouraged children to adopt a growth mindset which further led them to higher task achievement, while praise for intelligence or the person as a whole could undermine children’s motivation and performance [64–66]. As Needham’s observation indicated that Chinese culture might be accused of resulting in limited creativity [30,63,67], the effects of priming virtue or mind learning beliefs on children’s performance at creativity tasks is particularly worth exploring.

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Appendix A

Table A1. The self-developed conception correlation scale used in Study 1b.

Please evaluate the correlation between the following 20 conceptions and “learning” by ticking in the corresponding grid. 1 point = lowest correlation with learning, 7 points = highest correlation with learning.

| Conceptions                          | Correlation points |
|--------------------------------------|--------------------|
| (1) Perseverance (坚持)              |                    |
| (2) Recitation (背诵)                |                    |
| (3) Thinking (思维)                  |                    |
| (4) Interest (兴趣)                  |                    |
| (5) Cherishing time (惜时)           |                    |
| (6) Discovery (发现)                 |                    |
| (7) Exploration (探究)               |                    |
| (8) Comprehension (理解)             |                    |
| (9) Earnestness (认真)               |                    |
| (10) Proficiency (熟练)              |                    |
| (11) Smartness (聪明)                |                    |
| (12) Carefulness (细致)              |                    |
| (13) Endurance of hardship (刻苦)    |                    |
| (14) Diligence (勤奋)                |                    |
| (15) Discussion (讨论)               |                    |
| (16) Innovation (创新)               |                    |
| (17) Intelligence (智力)              |                    |
| (18) Concentration (专注)             |                    |
| (19) Talent (天赋)                   |                    |
| (20) Ambition (志向)                 |                    |

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