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We are not WEIRD: Chinese culture and psychology

Edited by
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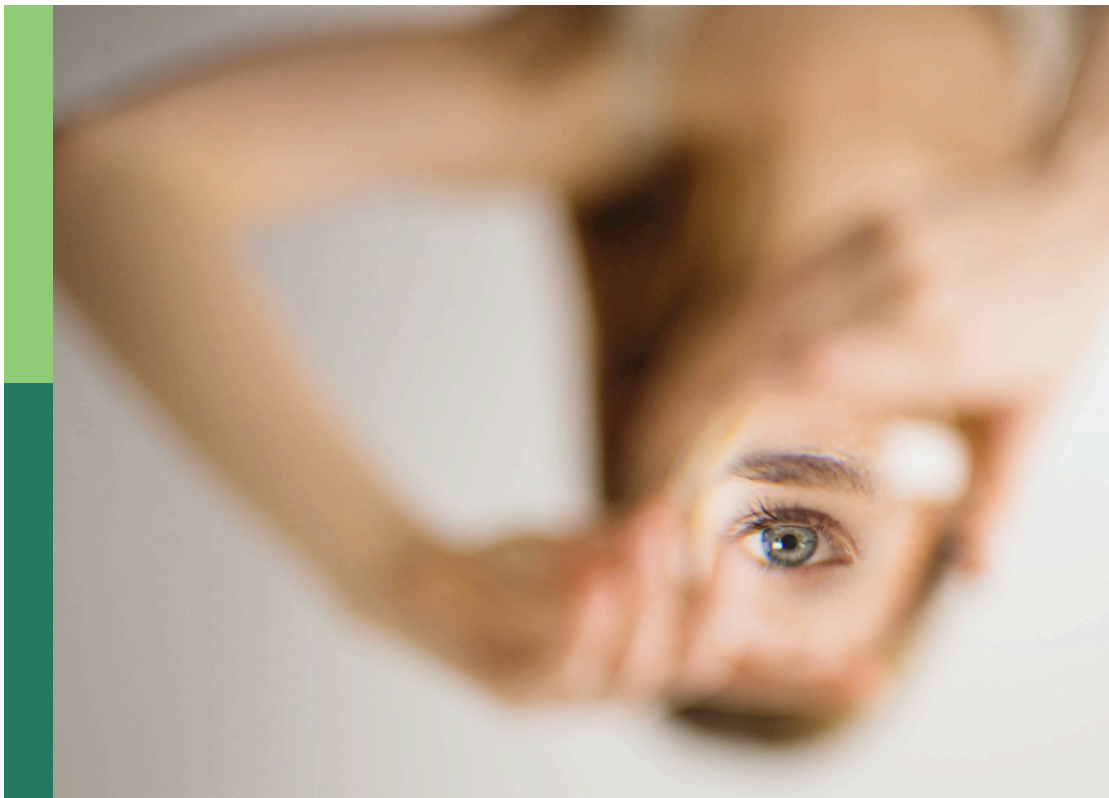

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We are not WEIRD: Chinese culture and psychology

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Editorial: We are not WEIRD: Chinese culture and psychology

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Chinese culture, Chinese traditions, self-cultivation, Confucianism, Taoism, Buddhism

Editorial on the Research Topic
We are not WEIRD: Chinese Culture and Psychology

Professor Kwang-Kuo Hwang, my mentor, and I organized this current Research Topic. It is an extended issue of the previous issue titled "*Eastern Philosophies and Psychology: Toward Psychology of self-cultivation*" (Hwang et al., 2017). However, sadly, he passed away peacefully in his sleep on July 30, 2023. The sudden passing of my mentor is genuinely unacceptable and heartbreaking. He often remarked that the research orientation of "logical positivism" is not the biggest obstacle to developing and publishing indigenous social science (Hwang, 2019). He further emphasized that many Chinese scholars unquestioningly adopted Western social science theories without critical thinking, engaging in research that merely mimics existing academic work and neglects Chinese culture. Furthermore, he pointed out that there needs to be more understanding of the essence of Western science, which is scientific philosophy. The biggest misconception is that Western scientific philosophy is confined to logical positivism only.

By providing a thorough scientific interpretation of Chinese traditions and revolutionizing "WEIRD" psychology and social science (Hwang, 2012; Shiah, 2016, 2021, 2023; Kuo et al., 2022; Xu et al., 2022), we can pave the way for a transformative movement. For the sake of establishing an autonomous academic tradition of social science in transformative Confucian culture, we established the Chinese Indigenous Social Science Association in 2018 in Taiwan to promote this movement, and I am the current president of the association. We encourage our colleagues to construct their theoretical models for conducting empirical research in Chinese societies, which is also the primary reason for establishing the current Research Topic.

We decided to increase the visibility of Chinese culture and psychology by publishing our works in an international journal of high reputation, and *Frontiers in Psychology* became our first choice. We called for papers on *Philosophical and Theoretical Psychology* from the international academic community and obtained a total submission of 87 articles. Eventually, 11 articles were accepted for publication after a strict review procedure by FIP standards.

The two following papers are from the theoretical perspective. Chang Azanlansh constructed the Dialectical Mandala Model of Self-cultivation to provide a universal framework for the multifaceted and systematic analysis of self-cultivation traditions, enabling future research to further develop additional culturally specific ontologies and psychological models in the second step of the strategy. This model can assist researchers in making ontological commitments, understanding self-cultivation more comprehensively, and determining whether they have overlooked any research domains. Chen proposed

a dual-mode framework of achievement goals to conceptualize the motivation for academic learning, including two kinds of effort beliefs (obligation-oriented and improvement-oriented belief about effort) students may develop when pursuing academic achievement in societies influenced by Confucian-heritage contexts (CHC).

Li et al. pointed out that, according to the role obligation theory of self-cultivation, learners in CHC tend to perceive academic failure from personal and interpersonal perspectives. The fundamental differences in fear of failure further indicated the inadequacy of the self-worth theory in explaining achievement motivation, where relationalism and role obligations are significant parts of the cultural traditions. Fwu et al. found that CHC's teachers who hold an obligation belief tend to attribute students' failure to a lack of fulfilling duties and provide duty-based feedback, including comforting and advisory feedback based on duty, encouraging students to persevere rather than change direction.

Wong and Cowden provide some strategies for advancing a global psychological science that could enrich the WEIRD-centric landscape of current psychological science. Tang et al. found that independence, intention of residential mobility, and relational mobility positively influenced the preference for cosmopolitan cities. Shu et al. targeted the sense of belonging and homeland construction for refugees and their descendants. They ascribed meanings to resettlement sites and experienced specific emotions within them, thereby fostering a sense of place identity and initiating the process of homeland construction.

Liu et al. found a more robust kinship premium in generosity among Chinese than French students and no significant effect of cultural collectivism. Han proposed a "cultural perception + functional satisfaction and burnout + social media" framework to interpret Chinese youth kinship communication activity. Yik and Chen found an inconsistent result to previous findings that Chinese people did not have a higher tendency to report somatic symptoms of their psychological distress than people with a European ethnic background. Qin reported Longtao He's book investigating the experiences and perceptions of filial care among migrant peasant workers who came home from cities to provide care for elderly parents with advanced cancer.

Those articles provide us with solid confidence that the strategy of constructing culture-inclusive theories and their empirical studies by integrating Western and Eastern philosophies opens a new field of psychology.

Finally, I commemorate Professor Huang's contributions to indigenous Chinese social sciences through this Research Topic.

Author contributions

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The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Hwang, K.-K. (2012). *Foundations of Chinese Psychology: Confucian Social Relations*. New York: Springer-Verlag. doi: 10.1007/978-1-4614-1439-1

Hwang, K.-K. (2019). *Culture-inclusive theories: An epistemological strategy*. Cambridge University Press.

Hwang, K.-K., Shiah, Y.-J., and Yit, K.-T. (2017). Eastern philosophies and psychology: towards psychology of self-cultivation. *Front. Psychol.* *8*, 1083. doi: 10.3389/fpsyg.2017.01083

Kuo, Y.-F., Chang, Y.-M., Lin, M.-F., Wu, M.-L., and Shiah, Y.-J. (2022). Death anxiety as mediator of relationship between renunciation of desire and mental health as predicted by Nonself Theory. *Sci. Rep.* 12, 10209. doi: 10.1038/s41598-022-14527-w

Shiah, Y.-J. (2016). From self to nonself: the nonself theory. *Front. Psychol.* *7*, 1–12. doi: 10.3389/fpsyg.2016.00124

Shiah, Y.-J. (2021). *Foundations of Chinese Psychotherapies: Towards Self-Enlightenment*. Cham: Springer International Publishing.

Shiah, Y.-J. (2023). The nature of consciousness: contentless consciousness theory. *World Futur.* 2023, 1–19. doi: 10.1080/02604027.2023.2226595

Xu, J., Chang, N.-S., Hsu, Y.-F., and Shiah, Y.-J. (2022). Comments on previous psychological Tai-Chi models: Jun-zi Self-cultivation Model. *Front. Psychol.* 13, 871274. doi: 10.3389/fpsyg.2022.871274

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The impact of teacher feedback on students' decisions to stay on or change course after math failure in a Confucian cultural context

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Previous research indicated that instructors holding entity belief tended to judge students to have low ability and provided ability-comforting feedback following math failure. Students receiving such feedback tended to quit and change course, creating a potential decrease in the pool of students pursuing math related fields. In Confucian heritage cultures (CHCs), the ideal society is primarily based on fulfillment of duties. Thus, the ability-based findings, derived from WEIRD samples, may not apply to duty-based CHCs. We hypothesized that CHC's teachers holding obligation belief tend to attribute students' failure to lack of duty fulfillment and provide duty-based feedback, including duty-comforting and duty-advising feedback, which motivates students to stay on rather than change course. To validate our hypothesis, we conducted three scenario experiments with 160 college students with teaching experiences, 273 high school students, and 369 pre-service teachers in Taiwan. Results showed that while ability-based paradigm may be culture-free, duty-based paradigm seems to be culture-bound. Consistent with previous research, teachers with entity belief tended to give ability-comforting feedback, pushing students to pursue non-math related fields. In contrast, teachers with obligation belief were likely to offer duty-comforting and duty-advising feedback, contributing to students' persistent pursuit in math. Furthermore, three fifths of teachers were inclined to provide ability-comforting, duty-comforting and duty-advising feedback concurrently, thus putting students in an unpleasant predicament that might be detrimental to their psychological well-being. Theoretical and practical implications are discussed.

KEYWORDS

entity belief, math failure, obligation belief, path-changing, teacher feedback

Introduction

Failure is an inevitable yet essential part of learning. Students' decision to persist or quit after setbacks is likely influenced by teacher feedback, which has been identified as one of the top ten factors that affect student achievement (Hattie, 2009). Teacher feedback may inadvertently convey teacher's belief and attribution, which impact student motivation. Rattan et al. (2012) found that instructors endorsing an entity theory tended to judge students to have low ability thus comfort students who failed math by saying "It's OK. It's just not the case that everyone is a 'math person.' I want you to remember how great you do in other subjects." Such ability-comforting feedback demotivated students to learn math, and rather motivated them to pursue non-math related fields, creating a potential crisis of shrinking STEM (Science, Technology, Engineering, and Math) talent pool.

Prior studies have examined the sociocultural influences on student approaches to learning (Biggs, 1996), students' attitudes towards assessment (Kennedy et al., 2008; Leong et al., 2018), and students' attitudes toward mathematics in flipped classrooms (Ryan et al., 2014; Karjanto and Simon, 2019). By the same token, studies have emphasized the importance of understanding the role of teacher feedback in student learning in school settings within their own sociocultural context (de Luque and Sommer, 2000; Torrance, 2012; Yang and Yang, 2018). Many researchers (Arnett, 2008; Henrich et al., 2010; Raffaelli et al., 2013; Pollet and Saxton, 2019) have raised concerns that a large majority of psychological research came from WEIRD (Western, Educated, Industrialized, Rich, and Democratic) samples, predominantly American undergraduates, who only represent 12% of the world population. However, most non-WEIRD scholars assumed that these research findings represent "truth" and implanted them to their native countries unquestionably (Hwang, 2010), which may cause neglect of important cultural factors that have profound impacts on human behavior in their own cultures (Hwang, 2005). In Confucian heritage cultures (CHCs), the ideal society is primarily based on fulfillment of duties (Cheng, 1990). Therefore, Rattan et al.'s ability-based findings, derived from WEIRD samples, may not fully apply to duty-based CHCs. We argue that CHC's teachers tend to provide duty-based feedback, which motivates students to stay on rather than change course. Such persistence to overcome learning difficulties and challenges may lead students to perform well in international assessments such as TIMSS and PISA (Schleicher, 2019; Mullis et al., 2020) and provide abundant talent pool in STEM (Guo, 2013).

Li (2002, 2005, 2012) indicated that Western and CHC's people hold fundamentally different beliefs about learning that influence how they approach education. The Western mind-oriented model of learning focuses on cognitive domain, aiming to cultivate the mind to understand the world, whereas the CHC's virtue-oriented model of learning stresses the development of the whole person, intending to perfect oneself morally and maintain harmonious relationships with significant others socially. In line with mind-oriented model, the aforementioned ability-based feedback seems to be related to Dweck's entity theory (Dweck and Leggett, 1988; Dweck, 1999), focusing on an individual's belief that human traits and qualities such as abilities are fixed. Previous research indicated that teacher emotions and behaviors, including ability-comforting feedback, may unintentionally and unwittingly communicate low-ability cues (Graham, 1984; Barker and Graham, 1987; Graham and Barker, 1990; Butler, 1994; Georgiou et al., 2002; Weiner, 2010; Rattan et al., 2012; Lou and Noels, 2020; Taxer and Frenzel, 2020). For entity theorists, if perceived ability to perform a task is low, the perceived possibility for mastery and success is also low. They thus tend to pursue a task they are good at because they have a better chance of success.

In accordance with virtue-oriented model, duty-based feedback appears to be associated with obligation belief, which can be dated back to the role obligation theory of self-cultivation (ROT) in CHCs (Fwu et al., 2021). The ROT perspective argues that individuals' traits *should* be continuously improved to achieve the ultimate good (zhì shàn, 至善), as depicted in a Chinese axiom, "If you can improve yourself in a day, do so each day, forever building on improvement" (original source: 《dàxué》 gǒu rì xīn rì rì xīn yòu rì xīn, 《大學》「苟日新，日日新，又日新」) (Fwu et al., 2021). Hence, obligation belief emphasizes that continual and endless self-improvement is not only possible but also mandatory. It is one's *obligation* to realize one's full potential through a continuous process of self-perfection to become an ideal virtuous person (Hwang, 2012; Fwu et al., 2017). As expectations for achieving the ultimate good can be elevated without limits, one should perfect oneself to fulfill one's duty in one's lifetime. The obligation belief appears to corroborate to incremental belief, i.e., the opposite of entity belief, because it stresses that human attributes are not fixed.

In school settings, CHC's students are expected to work hard and perform well so as to fulfill their role obligations. Research conducted in CHCs indicated that schoolteachers gave struggling students duty-based feedback (Wang, 1998). For those who were slow but fulfilled their duty as hardworking students, teachers tended to offer duty-comforting feedback, like "It's OK. As long as you have exerted yourself in the learning process, you do not owe anyone an apology." For those who were smart but did not work hard to fulfill their duty, teachers tended to give duty-advising feedback by saying "You reap what you sow. If you try your hardest, you will certainly perform better" (Wang, 1998). While duty-comforting feedback focuses on consoling students for hard work and suggesting working smart strategy to perform well, duty-advising feedback stresses advising students to cultivate their moral virtues by working hard. Thanh Pham and Renshaw (2015) contend that the cultural values internalized through students' socialization heavily influence the ways in which they perceive and respond to teacher feedback.

Taken together, we hypothesized that consistent with Rattan et al.'s findings, teachers holding entity belief are likely to judge students to have low ability and give ability-comforting feedback after math failure, whereas those holding obligation belief tend to diagnose students' lack of duty fulfillment and provide duty-based

feedback (H1). Furthermore, students receiving ability-comforting feedback are inclined to pursue non-math related fields, whereas those receiving duty-based feedback tend to persist in math (H2). Lastly, cross-cultural research has indicated that North Americans who succeeded on a task persisted on a follow-up task, whereas East Asian students tended to persist after failure (Heine et al., 2001; Zhang and Cross, 2011). Consequently, we hypothesized that CHC's teachers tend to provide duty-comforting and duty-advising feedback that motivate students to stay on rather than change course (H3). We tested these hypotheses in three studies. This research has obtained IRB approval from the Institutional Review Board at National Taiwan University (NTU-REC: 201705HS032 & 201805HS009).

Study 1

The aim of Study 1 was to examine whether Rattan et al.'s (2012) claim that instructors holding entity belief were more likely to make low ability attribution and give ability-comforting feedback is culture-free. Moreover, we explored if teachers holding culturally relevant obligation belief tended to ascribe failure to insufficient duty fulfillment and provide duty-comforting and duty-advising feedback, signifying a culture-bound phenomenon. We investigated the impacts of teacher beliefs on the attributions of student failure and the types of feedback given to failing students.

Method

Participants and procedure

Participants were 160 college students with teaching experience in their own study fields from a top university in Northern Taiwan. Data collection occurred during TA workshops or regular classes. Trained research assistants administered the questionnaire. After giving their consent, participants responded to the questionnaire on a voluntary and anonymous basis. All participants received NTD $50 (approximately USD $2) in compensation for their time. To ensure data quality, 2 participants were excluded for failing attention checks, resulting in a valid sample size of 158 (98 males, $M_{age} = 23.25$, $SD = 2.94$; 60 females, $M_{age} = 21.18$, $SD = 2.83$).

We applied the scenario method, which may be like a behavioral observation in controlled conditions where unwanted situational factors are minimized (Peng et al., 1997). Participants began with a "teacher belief" survey, in which entity and obligation beliefs were embedded. Participants were then instructed to read a scenario that "after the mid-term examination, you met with a student named Minghua (明華, gender neutral name in CHCs), who had received 65 out of 100 points on the first test of the year, and discussed their performance individually." Next, participants were asked about their attribution to Minghua's math performance and a series of feedback items measuring the degree to which they would give to them.

Measures

All measures outlined below were rated on a Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). All detailed items of each construct in teacher belief, attribution and feedback were listed in Supplementary material 1.

Teacher belief

Teacher belief included entity belief and obligation belief.

Entity belief (EB) meant viewing personality trait/quality as an unchangeable, fixed internal characteristic, which was measured by four items adopted from "Kind of Person" Implicit Theory Scale (Dweck, 1999; $\alpha = 0.88$). A sample item from the scale read, "Everyone is a certain kind of person, and there is not much that can be done to really change that." Higher scores indicate higher tendency of holding entity belief.

Obligation belief (OB) was defined as viewing improving one's personality trait/quality as one's own duty and responsibility, which was measured by five items derived from the Scale of Role Obligation Theory of Self-cultivation (Yang et al., 2021a; $\alpha = 0.90$). A sample item from the scale read, "One should be ever-seeking to improve and further refine oneself." Higher scores indicate higher tendency of holding obligation belief.

Teacher attribution

Teacher attribution referred to how participants explained the causes of the protagonist's academic failure in the scenario, which was measured by two factors: Minghua's performance was not satisfactory because of a lack of ability and a lack of duty fulfillment.

Lack of ability (LA) was defined as low inborn talent, which was assessed by three items taken from the Scale of Failure Attribution (Yang et al., 2021b; $\alpha = 0.88$). A sample item from the scale read, "Minghua is not good at the subject." Higher scores indicate higher level of low ability.

Lack of duty fulfillment (LD) referred to failing to exert himself/herself to fulfill his/her duty, which was measured by four items taken from the Scale of Failure Attribution (Yang et al., 2021b; $\alpha = 0.90$). A sample item from the scale read, "Minghua did not do whatever he/she can to fulfill his/her obligation." Higher scores indicate higher level of insufficient duty fulfillment.

Teacher feedback

Teacher feedback referred to information provided by teachers following a student's math failure, including ability-comforting, duty-comforting and duty-advising feedback.

Ability-comforting feedback (AC) was defined as consoling struggling students for their low ability and enacting potentially unhelpful pedagogical practices, which were assessed by eight items adapted from Rattan et al.'s (2012) research (Chen et al., 2021; $\alpha = 0.82$). Two sample items from the scale included, "It's just not the case that everyone has a talent for this subject" and "I'm going to give you some easier tasks to work on so you can get more comfortable with those skills." Higher scores indicate higher likelihood of giving ability-comforting feedback.

Duty-comforting feedback (DC) was defined as consoling failing students' disappointment by praising their good learning attitudes and offering working-smart strategies for success, which were assessed by seven items adapted from Chen et al.'s (2021) research ($\alpha = 0.82$). Two sample items from the scale included, "Good attitude in the learning process is more important than end results" and "If you have trouble understanding what was taught, you can ask your classmates for help." Higher scores indicate higher likelihood of giving duty-comforting feedback.

Duty-advising feedback (DA) was defined as a reminder of "no pains, no gains" and giving working-hard strategies for success, which were assessed by eight items adapted from Wang's (1998) research (Chen et al., 2021; $\alpha = 0.89$). Two sample items from the scale included, "You reap what you sow" and "I suggest you review what was taught in class." Higher scores indicate higher likelihood of giving duty-advising feedback.

Results and discussion

To validate H1, we identified participants with low-and high-scores on entity belief and obligation belief, respectively. Participants with high and low scores were defined as participants whose scale average value was one standard deviation above and below the scale mean, respectively. Table 1 listed Means, SD, cut-off values, and numbers of students in low-score and high-score groups in entity and obligation beliefs.

Unexpectedly, results indicated that there was no significant difference in lack of ability between high-score and low-score groups of entity belief. However, as hypothesized, results indicated a significant difference in lack of duty fulfillment between high-score ($M = 4.70$, $SD = 0.80$) and low-score groups ($M = 3.75$, $SD = 0.92$) of obligation belief, $t(44) = 3.20$, $p < 0.05$, but no significant difference between the two groups of entity belief. Moreover, as predicted, we found a significant difference in ability-comforting feedback between high-score ($M = 3.96$, $SD = 1.04$) and low-score groups ($M = 3.35$, $SD = 0.76$) of entity belief, $t(83) = 2.20$, $p < 0.05$, but no significant difference between the two groups of obligation belief. We also found a significant difference in duty-comforting feedback between high-score ($M = 5.33$, $SD = 0.66$) and low-score groups ($M = 4.42$, $SD = 0.67$) of obligation belief, $t(44) = 4.86$, $p < 0.05$, but no difference between the two groups of entity belief. Similarly, there was a significant difference in duty-advising feedback between high-score ($M = 4.57$, $SD = 1.16$) and low-score groups ($M = 3.58$, $SD = 0.56$) of obligation belief, $t(44) = 4.51$, $p < 0.05$, but no significant difference between the two groups of entity belief (see Figure 1).

In sum, results replicated Rattan et al.'s (2012) findings that instructors who held entity belief were inclined to provide ability-comforting feedback. In contrast, instructors who held obligation belief tended to ascribe failure to lack of duty fulfillment and offered duty-comforting and duty-advising feedback.

How would students perceive their teacher's belief and attribution and respond after receiving three different types of teacher feedback following math failure? Study 2 explored these questions through three scenarios associated with ability-comforting, duty-comforting and duty-advising feedback conditions and examined students' perceptions and decisions to stay on or change course after hearing such feedback from a teacher.

Study 2

The aim of Study 2 was to investigate the differences in students' perceptions of teacher belief and attribution as well as their own decisions to change course or stay on, among students exposed to ability-comforting, duty-comforting and duty-advising feedback conditions following math failure.

Method

Participants and procedure

Rattan et al. (2012) conducted research at a competitive university in North America where students do not have to declare major until enrolling in universities. However, senior high school students in Taiwan need to select a major of study: STEM or humanities/social sciences by 10th grade, which determines their majors in university. Moreover, while most public senior high schools are coeducational, major public "star" senior high schools are single-gender. In an effort to replicate Rattan et al.'s (2012) research, we recruited 273 tenth graders from two highly selective single-sex senior high schools, one for boys and the other for girls in the Taipei metropolitan area, which admitted students who scored top on national entrance examinations. Data collection occurred a week after mid-term math examinations during regular classes. Trained research assistants administered the questionnaire. After giving their consent, participants responded to the questionnaire on a voluntary and anonymous basis. All participants received NTD $50 (approximately USD $2) in compensation for their time. To ensure data quality, 3 participants were excluded because of failed

TABLE 1 Means, SD, cut-off values, and numbers of low-and high-score groups of EB and OB.

	Mean	SD	Cut-off values of low-score group	Cut-off values of high-score group	Numbers of participants in low-score group	Numbers of participants in high-score group
EB	3.30	1.09	2.21	4.39	21	21
OB	4.48	0.96	3.52	5.44	20	26

EB, Entity belief; OB, Obligation belief.

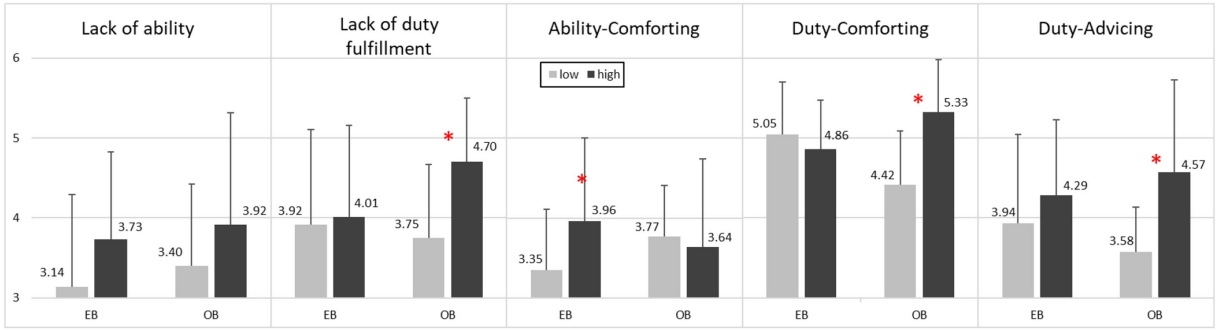

FIGURE 1
Mean scores of lack of ability, lack of duty fulfillment, ability-comforting, duty-comforting, and duty-advising feedback between low-and high-score groups in EB and OB. EB, Entity belief; OB, Obligation belief. Scores between low-and high-score of EB and OB groups were compared using two tailed *t* test. *$p<0.05$.

attention checks, resulting in a valid sample size of 270 (126 boys, $M_{age} = 15.89$, $SD = 0.34$; 144 girls, $M_{age} = 15.87$, $SD = 0.41$).

We applied the scenario method that described "after the mid-term math examination, you met with your teacher to learn your low score on the math test (65 out of 100 points). Your math teacher noticed that you were not happy and probably disappointed by your grade." Participants were then randomly assigned to one of the three hypothetical feedback conditions, including ability-comforting, duty-comforting, and duty-advising feedback. Ability-comforting feedback focused on students' strengths and comforting their weaknesses. Duty-comforting feedback emphasized praising students' good learning attitudes and offering strategies for studying smarter, whereas duty-advising feedback stressed urging students to study hard to fulfill their duties. All detailed conditions of teacher feedback were listed in Supplementary material 2. Participants pretended that the hypothetical situation happened to them. After reading the scenario, participants were asked to respond to 22 items rated on a Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Their responses indicated how they personally felt about the feedback at that time.

Measures

The response items of each construct, including perceived teacher belief, perceived teacher attribution, and students' behavioral intentions were listed in Supplementary material 1.

Perceived teacher belief

Perceived teacher belief referred to participants' perceptions about their teacher belief, including perceived entity belief and perceived obligation belief.

Perceived entity belief (EBp) meant that participants viewed their teachers as having entity belief, which was measured by four items taken from the "Kind of Person" Implicit Theory Scale (Dweck, 1999; e.g., "I felt my teacher believed everyone is a certain kind of person, and there is not much that can be done to really change that," $\alpha = 0.90$). Higher scores indicate higher levels of perceived teacher's entity belief.

Perceived obligation belief (OBp) meant that participants viewed their teachers as having obligation belief, which was assessed by four items from the Obligation Belief Scale (Yang et al., 2021a; e.g., "I felt my teacher believe one should be ever-seeking to improve and further refine oneself," $\alpha = 0.94$). Higher scores indicate higher levels of perceived teacher's obligation belief.

Perceived teacher attribution

Perceived teacher attribution referred to participants' perceptions about teacher's failure attributions, including perceived lack of ability and perceived lack of duty fulfillment.

Perceived lack of ability (LAp) meant that participants regarded their teachers as attributing failure to low innate talent, which was measured with three items from the Scale of Failure Attribution to Lack of Ability (Yang et al., 2021b; e.g., "I felt my teacher think I'm not good at math," $\alpha = 0.94$). Higher scores represent higher levels of perceived teacher's low ability attribution.

Perceived lack of duty fulfillment (LDp) meant that participants viewed their teachers as attributing failure to insufficient duty fulfillment, which was assessed with four items from the Scale of Failure Attribution to Lack of Duty Fulfillment (Yang et al., 2021b; e.g., "I felt my teacher think I did not do my best to fulfill my role as a student," $\alpha = 0.96$). Higher scores represent higher levels of perceived teacher's low duty fulfillment attribution.

Students' behavioral intentions

Behavioral intentions referred to participants' decisions to stay on or change path. Rattan et al. (2012) indicated that participants in ability-comforting feedback are unmotivated to work on math, and might pursue non-math related areas. This study, aside from persistent behavior in math following failure, added path-changing to directly assess participants' decision to switch to non-math related fields.

Staying-on referred to the intention of persistence to study math, which was measured with three items adapted from Rattan et al. (2012) and Fwu et al. (2018) (e.g., "I do not give up easily in the face of difficulty on math tests," $\alpha = 0.80$). Higher scores indicate higher intention of persisting in math.

Path-changing meant the intention to pursue a non-math field, which was assessed with four items from the Scale of Path-Changing (Chen et al., 2021; e.g., "I will switch to a field that I am good at," $\alpha = 0.91$). Higher scores indicate higher intention of changing to non-math fields.

Results and discussion

Profile analysis

Descriptive statistics for all items for high-school students were shown in Supplementary material 3. To validate H2, profile analysis was used to identify whether three groups of participants in this study show a significantly distinct profile. As expected and shown in Figure 2, students in an ability-comforting feedback condition were most likely not only to perceive their teacher as endorsing entity belief and attributing failure to low ability, but also to pursue non-math fields among the three feedback conditions. In contrast, students exposed in duty-based conditions, including both duty-comforting and duty-advising feedback, were more inclined not only to perceive their teacher as having obligation belief and attributing failure to insufficient duty fulfillment, but also to stay on math field than those in the ability-comforting feedback condition. There were no significant differences between girls and boys in their perception of teacher belief, teacher attribution, and their own behavioral intentions.

In short, consistent with Rattan et al.'s (2012) research, ability-comforting feedback not only conveyed more of an entity theory and a cue of lack of ability, but also led students to pursue non-math related fields compared to the other two duty-based feedback conditions. Conversely, duty-comforting and duty-advising feedback not only reflected more of an obligation belief and a cue of lack of insufficient duty fulfillment, but also motivated students to persist in math learning. Moreover, it is worth noting that, both ability-comforting and duty-comforting feedback attempted to ease students' discomfort and pressure following math failure; however, the former pushed students to change to non-math fields, whereas the latter encouraged them to stay on.

Study 2 indicated that while ability-comforting feedback led students to switch to non-math related fields, duty-comforting and duty-advising feedback led students to persist in math. How would CHC's teacher give feedback to students following academic failure? How can teachers be categorized by using the aforementioned feedback conditions (i.e., ability-comforting, duty-comforting, and duty-advising)? This question was addressed in the next study.

Study 3

The aim of Study 3 was to investigate whether a majority of teachers tend to provide duty-based feedback rather than ability-comforting feedback, thus motivating failing students to stay on.

Method

Participants and procedure

A total of 369 pre-service teachers of secondary education programs were recruited from three universities in Northern Taiwan. Data collection occurred during regular classes. Trained research assistants administered the questionnaire. After giving

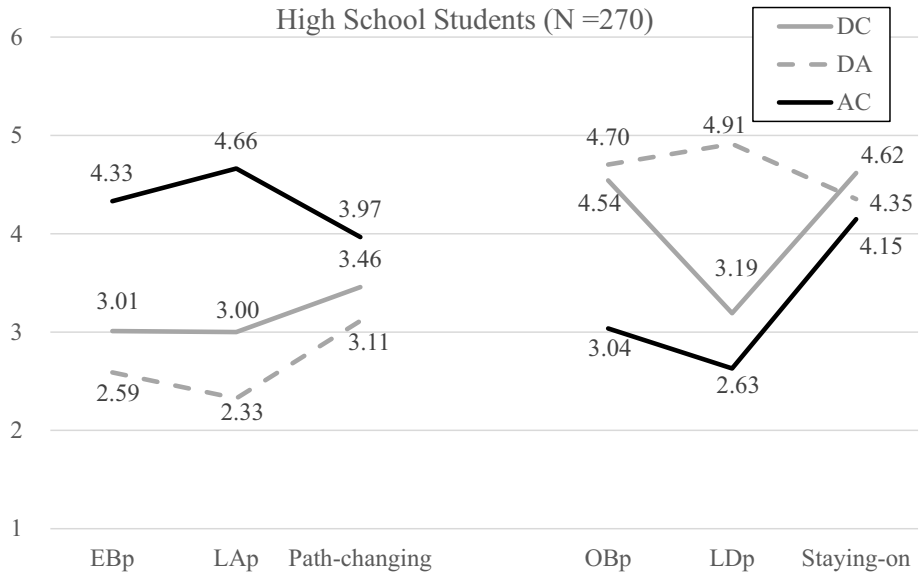

FIGURE 2
Results of profile analysis of the impact of teacher feedback on students' perceived teacher belief, teacher attribution, and students' behavioral intentions. EBp, Perceived entity belief; LAp, Perceived lack of ability; OBp, Perceived obligation belief; LDp, Perceived lack of duty fulfillment.

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TABLE 2 Model fit indices and degree of freedoms under models with different numbers of groups.

Models	C1	C2	C3	C4
BIC	287.78	163.02	184.74	180.4
CAIC	293.78	183.02	197.74	207.4
Entropy	1	0.69	0.77	0.77
df	57	50	43	36

TABLE 3 Conditional probabilities and group proportions of two observed latent groups.

	AC + DC + DA	DC + DA
proportion	60.0%	40.0%
AC1	**0.799**	0.053
AC2	**0.918**	0.201
DC1	**1.000**	**0.982**
DC2	**0.986**	**0.979**
DA1	**0.863**	**0.713**
DA2	**0.861**	**0.735**

Conditional probabilities greater than 0.700 were shown in bold. AC, Ability-comforting feedback; DC, Duty-comforting feedback; DA, Duty-comforting feedback. Detailed explanations of AC1, AC2, DC1, DC2, DA1, and DA2 were shown in Supplementary material 4.

their consent, participants responded to the questionnaire on a voluntary and anonymous basis. Each participant was compensated NTD $50 for their participation. Three participants were excluded for failing the attention check questions, resulting in a valid sample size of 366 (178 males, $M_{age} = 21.63$, $SD = 3.09$; 188 females, $M_{age} = 21.90$, $SD = 3.50$). The sample included 38.3% STEM majors, 41.3% Humanities/Social Science majors, and 20.5% other majors. We used the scenario method that depicted "you imagine yourself as a high school teacher. After the mid-term examination, you met with your student named Minghua, who had received 65 out of 100 points on the first test in the subject you taught. You had a chance to discuss with them individually." Participants were asked to provide Minghua with feedback.

Measures

All measures for ability-comforting, duty-comforting, and duty-advising feedback were identical to Study 1.

Results and discussion

Latent class analysis

To validate H3, we conducted a latent class analysis (LCA) to investigate possible underlying groups of teachers who gave feedback with the following three steps. First, to better explain the latent classes, we transferred the parceled indicators into 2-point scale before applying in LCA. Those above or equal to 4 points (4 = somewhat agree, 5 = agree, 6 = strongly agree) were coded as 1, whereas those below or equal to 3 (3 = somewhat disagree, 2 = disagree, 1 = strongly disagree) were coded as 0. Second, to find the most proper number of groups to explain the data, we took one to four latent class models into consideration and adopted the most interpretable and parsimonious model suggested by model fit indices, BIC and CAIC. Finally, according to the selected model, we explained the characteristics of each latent class. All data analysis procedures were performed in SAS (9.4; Lanza et al., 2007).

Model selection

Table 2 presents the model fit indices, of which two latent groups model with lowest BIC and CAIC (C2) were identified as the most fit.

Parameter estimates

Table 3 shows the results of LCA, indicating two major groups of teachers who gave different combinations of teacher feedback. A larger group was the combination of AC, DC and DA (60.0%), followed by a smaller group of combining DC and DA (40.0%).

In summary, unlike Rattan et al.'s (2012) findings, no teacher groups gave AC only. On the contrary, as expected, the two teacher groups provided duty-comforting and duty-advising feedback that motivate students to persist after academic failure. However, three-fifths of teachers gave ability-comforting, duty-comforting and duty-advising feedback concurrently. While ability-comforting feedback pushed struggling students to disengage from math learning, duty-comforting and duty-advising feedback encouraged them to stay on. Such mixed and contradictory feedback might create intra-personal conflicts and confusion for students of what to do next.

General discussion

The present research intended to investigate the impacts of teacher feedback on students' decision to stay on or change course after math failure in a Confucian cultural context. We found that, first, while teachers holding entity belief were inclined to provide ability-comforting feedback, those holding obligation belief tended to offered duty-comforting and duty-advising feedback. Second, ability-comforting feedback conveyed teacher's entity belief and low ability attribution as well as led students to pursue non-math related fields, whereas duty-comforting and duty-advising feedback communicated teacher's obligation belief and attribution to insufficient duty fulfillment as well as motivated students to persist in math learning. Third, both ability-comforting and duty-comforting feedback attempted to ease students' discomfort and pressure following math failure; nevertheless, the former pushed students to pursue non-math fields, whereas the latter encouraged them to persist in math fields. Fourth, although all Taiwanese teachers tended to offer duty-comforting and duty-advising feedback, three-fifths of teachers gave ability-comforting, duty-comforting and duty-advising feedback concurrently. The theoretical significance and practical implications are discussed as follows.

Culture-free vs. culture-bound in non-WEIRD societies

Arnett (2008) indicated that psychological research published in APA journals has been largely dominated by American

researchers and subjects. Among first authors, 73% were based at American universities, and 99% were at universities in Western countries, including English-speaking countries (such as the UK, Canada, Australia, and New Zealand) and Europe. Only 1% of first authors were from Asia. Similarly, 68% of the samples were in the United States, 95% were in Western countries, and only 3% were in Asia. In other words, the other 95% of the world's population is neglected. Henrich et al. (2010) further revealed that 96% of the subjects of psychological research published in the world's top journals came from WEIRD societies, comprising only 12% of the world's population. Raffaelli et al. (2013) contended that although a great majority of young people live in the "majority world" like developing countries, most contemporary theories and knowledge about adolescent development stemmed from research undertaken in the "minority world" such as WEIRD societies. Consequently, it is widely believed that psychological research depends heavily on WEIRD samples and among those from university students (Pollet and Saxton, 2019), which is incomplete and does not sufficiently represent the whole humanity.

In view of such phenomenon, three points are worth noting. First, although WEIRD samples included European participants, most researchers assumed that there should be many similarities between the United States and the rest of the West; consequently, few empirical studies sought to contrast Americans with European samples (Henrich et al., 2010). Second, even in the United States, research subjects are frequently biased toward middle-and upper-class children (Henrich et al., 2010), neglecting minorities and Asian Americans who might carry their CHC's upbringing. Third, due to the rise of globalization, a lot of international students with Confucian heritage culture are enrolled at American universities; at the same time, more and more international students attend universities in CHC's countries. However, research on the cross-population comparisons remains scant. Meadon and Spurrett (2010) contended that, the remedy for the existing bias is to foster research capacity in the non-Western world. Building research capacity should aim to generate studies led and initiated by non-Western researchers, who not only bring novel perspectives and ideas and are less affected by WEIRD bias, but also study non-WEIRD subjects, thus deepening the subject pool. This research provided a case in point, as it was initiated by non-WEIRD researchers with non-WEIRD samples.

Dweck et al.'s implicit theories (1988) and Rattan et al.'s (2012) findings originated from WEIRD nations may not fully apply to non-WEIRD societies such as CHCs. We should be extremely cautious to directly implant Western theories or research in non-Western cultural contexts. We argued that while some phenomena seem to be culture-free, others might be culture-bound. It is important for non-Western researchers to differentiate between the phenomena that are universal and culture-specific. The current findings showed that while ability-based paradigm might be culture-free, duty-based paradigm seems to be culture-bound. In both the West and CHCs, teachers who endorsed entity theory tended to give ability-comforting feedback. When students received such feedback, they tended to perceive their teacher as having entity belief and attributing failure to low ability as well as reported pursuing non-math related fields. As to the culture-bound paradigm, teachers who held culturally relevant obligation belief are more likely to offer duty-comforting and duty-advising feedback. Students responding to such feedback tended not only to perceive their teacher as having obligation belief and attributing failure to insufficient duty fulfillment, but also decided to stay on.

Student perceptions of hidden messages in teacher feedback

Past research showed that teacher emotions like sympathy or pity (Graham, 1984; Butler, 1994; Georgiou et al., 2002; Taxer and Frenzel, 2020) and teacher behaviors like praise following success at easy tasks or the absence of blame at such task (Barker and Graham, 1987; Graham and Barker, 1990; Weiner, 2010) can indirectly and even unknowingly convey low-ability cues. Rattan et al.'s (2012) research further found that the well-intentioned ability-comforting teacher feedback not only communicated low ability cue and teacher's entity belief, but also led struggling students to give up on math. Students' perceptions of hidden messages in ability-comforting feedback were the attribution of their failure to low ability, which is fixed and uncontrollable. Since there is nothing they can do about it, they may feel hopeless and pessimistic about pursuing a career in math related areas thus change course.

Echoing Rattan et al.'s study, our research extended the finding that students perceived the messages underlying duty-comforting and duty-advising feedback conditions as their teacher's obligation belief and cues of insufficient duty fulfillment. Since duty fulfillment is a controllable and obligatory factor, as long as they exert themselves to fulfill their obligations by working hard or working smart, their math ability can be developed and enhanced through continuous self-perfection. Instead of pursuing non-math related fields, they tended to stay on and try to overcome the difficulties and challenges during math learning. By doing so, they still have a ray of hope for success and cultivate their moral virtues.

Trade-off between positive and negative dimensions of ability-comforting vs. duty-comforting feedback

Although both ability-comforting and duty-comforting feedback tend to reduce students' pressure and discomfort, each type of comfort has its positive and negative sides. Ability-comforting feedback sends a message that while some are math persons, others aren't, implying that math persons succeed without persevering through difficulties or challenges. Such feedback functions as low ability cues that failing students have no talent for math, which pushes them to switch to other non-math related fields, causing potential decrease in the talent pool of STEM students; however, these students might have greater

opportunities to develop their full potentials and maintain their positive self-esteem in non-math related fields.

Duty-comforting feedback also has its bright and dark sides. Previous research revealed that, in CHCs such as Taiwan, compared with the arts, math was more likely to meet high parental expectation, students' greater sense of obligation and stronger peer competition (Fwu et al., 2017). Furthermore, it is widely believed that math is a "critical filter" for admission to top universities and STEM degrees, which lead to higher-paying jobs. Duty-comforting feedback sends a message that as long as one has exerted oneself in the learning process, one does not owe anyone an apology. Such feedback encourages students to persist to overcome difficulties and maintain their engagement in math learning. This may be one of the reasons why East Asian students perform well on international assessments such as PISA and TIMSS (Schleicher, 2019; Mullis et al., 2020), and students in Taiwan tend to pursue "hot fields" such as engineering, science and medicine (Guo, 2013), providing a deep talent pool for tech giants like TSMC, which produces the majority share of the world's semiconductor chips. However, the high math and science achievement of CHC's students on PISA is accompanied by higher levels of anxiety and self-doubting (Wilkins, 2004; Lee, 2009). This phenomenon may be related to the pressure to continuously do well on examinations among CHC's students (e.g., Tan and Yates, 2011). This concurred with previous findings that struggling students holding obligation-oriented belief about effort still tended to make effort after academic failure (Fwu et al., 2018). On top of this, duty-comforting feedback also conveyed a message that even though students are not good at math, they are still discouraged to change course. Under such circumstances, struggling students are under great pressure to stay on even when they face repeated math failures, which may be possible reasons to explain why students in CHCs suffered more mental health issues than their international counterparts (Lee, 2009; Morony et al., 2013; Stankov, 2013; Liu et al., 2017).

Practical implications of conflicting feedback

Our research found that, when encountering students' academic setbacks, a majority of teachers tended to provide ability-comforting, duty-comforting, and duty-advising feedback concurrently. What would be the reason for such mixed and contradictory feedback? It could be that teachers are influenced by both traditional obligation belief and recent Taiwanese education reforms, including 12-year basic education for all, and the new 12-year curriculum guidelines since the 2010s. Drawing inspiration mainly from WEIRD societies such as the United States, Finland, New Zealand, and the UK, the education reforms aimed to provide students with adaptive education to unleash their full potential, and broaden the scope of school success in both academic and non-academic domains in the process of student learning (Fwu et al., 2017; Coudenys et al., 2022). In addition to traditional duty-comforting and duty-advising feedback, we suggested that under the influence of recent education reforms, teachers were likely to provide ability-comforting feedback to encourage failing students to pursue the fields they believe they can develop their full potential.

The co-existence of conflicting feedback was likely to put students in a confusing and awkward situation that might be detrimental to their psychological well-being. The present research connects with other lines of research contending that CHC's students were often torn between moving forward and pulling back in academic learning. For instance, prior research revealed that low-performing students are trapped in a dilemma between a distressing emotional state ("feeling bad") for making too much effort in vain and a negative image ("being bad") for not making enough effort to fulfill their duty (Fwu et al., 2017). Moreover, failing students experience both the de-motivating emotion of hopelessness, discouraging them from trying to do well, and the motivating emotion of indebtedness, triggering persistence. These conflicting emotions create a predicament for students—whether to work hard or not (Fwu et al., 2021). All these dilemmas students suffer may reinforce their psychological distress derived from academic stress. We suggest that it is not only failure but also the constant forces of pushing forward and pulling back after failure from various perspectives that contribute to poor psychological well-being of CHC's students.

Limitations and future research

This research has several limitations. First, our samples were limited to public "star" senior high schools and universities in the Taipei metropolitan area of northern Taiwan. Whether these results can extend to students in other schools and universities in Taiwan, as well as in other CHCs and Western societies would be an interesting question for future research. Second, the present research found that students exposed to different feedback conditions demonstrated differences in students' perceptions about their teacher's belief and attribution and behavioral responses. Future studies should investigate whether students' own belief influences how they perceive teachers' feedback and unveil the psychological mechanism in which students' perceptions of teacher feedback relate to how they respond to feedback. Third, our research revealed that CHC's teachers tend to provide failing students with different combinations of teacher feedback. Further research is needed to identify what factors, e.g., teacher belief or teacher attribution, and how these factors affect teacher feedback following students' math failure.

Conclusion

Current mainstream psychological theories and research findings derived from WEIRD societies have been so dominant in academic circles that non-WEIRD researchers unconsciously

transplant them to their native societies without a doubt (Hwang, 2005, 2010). Findings stemming from such approach are mostly irrelevant to or inadequate for understanding the mentalities of local populations (Sinha, 1986). This research illustrated that it seems difficult to explain the dilemmas that CHC's students encountered without considering cultural factors that may influence teacher feedback and student responses. Therefore, non-WEIRD scholars are advised not only to be skeptical about the theories and findings derived from WEIRD samples but also to further distinguish between culture-universal and culture-specific phenomena in advancing psychological knowledge.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by Research Ethics Committee, National Taiwan University. Written informed consent for participation was not provided by the participants' legal guardians/next of kin because: Our research has obtained IRB approval from National Taiwan University (NTU-REC: 201705HS032). In accordance with the protocol outlined by NTU-REC: 201705HS032, no parental consent was required.

Author contributions

B-JF wrote the manuscript drafts, developed the study concept, and participated in designing the study and interpreting the findings. T-RY contributed to formulating the research questions, structuring the study design, organizing the analysis, and interpreting the results. Y-KC contributed to organizing and performing the statistical analysis, and participated in structuring the study design and interpreting the findings. RC revised the final manuscript. All authors read and approved the submitted version. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2022.1046806/full#supplementary-material

References

Arnett, J. J. (2008). The neglected 95%: why American psychology needs to become less American. *Am. Psychol.* 63, 602–614. doi: 10.1037/0003-066X.63.7.602

Barker, G. P., and Graham, S. (1987). Developmental study of praise and blame as attributional cues. *J. Educ. Psychol.* 79, 62–66. doi: 10.1037/0022-0663.79.1.62

Biggs, J. (1996). "Western misconceptions of the Confucius-heritage learning culture," in *The Chinese Learner: Cultural, Psychological and Contextual Influences*. eds. D. Watkins and J. B. Biggs (Hong Kong: The University of Hong Kong, Comparative Education Research Center), 45–67.

Butler, R. (1994). Teacher communications and student interpretations: effects of teacher responses to failing students on attributional inferences in two age groups. *Br. J. Educ. Psychol.* 64, 277–294. doi: 10.1111/j.2044-8279.1994.tb01102.x

Chen, Y. K., Yang, T. R., and Fwu, B. J. (2021). Self-enhancement or self-improvement after academic failure: scale development of path-changing and staying the course [Paper presentation]. Asian Association of Social Psychology 14th Biennial Conference, Seoul, Korea.

Cheng, S. K. K. (1990). Understanding the culture and behaviour of east Asians — a Confucian perspective. *Austr. N. Z. J. Psychiatry* 24, 510–515. doi: 10.3109/00048679009062907

Coudenys, B., Strohbach, G., Tang, T., and Udabe, R. (2022). "On the path toward lifelong learning: an early analysis of Taiwan's 12-year basic education reform," in *Education to build back better: What can we learn from education reform for a post-pandemic world*. eds. F. M. Reimers, U. Amaechi, A. Banerji and M. Wang (Switzerland: Springer), 75–98.

de Luque, M. F. S., and Sommer, S. M. (2000). The impact of culture on feedback-seeking behavior: an integrated model and propositions. *Acad. Manag. Rev.* 25, 829–849. doi: 10.2307/259209

Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. Philadelphia: Psychology Press.

Dweck, C. S., and Leggett, E. L. (1988). A social cognitive approach to motivation and personality. *Psychol. Rev.* 95, 256–273. doi: 10.1037/0033-295X.95.2.256

Fwu, B. J., Chen, S. W., Wei, C. F., and Wang, H. H. (2018). I believe; therefore, I work harder: the significance of reflective thinking on effort-making in academic failure in a Confucian-heritage cultural context. *Think. Skills Creat.* 30, 19–30. doi: 10.1016/j.tsc.2018.01.004

Fwu, B. J., Wang, H. H., Chen, S. W., and Wei, C. F. (2017). 'Feeling bad' or 'being bad?' The trapping effect of effort in academic failure in a Confucian cultural context. *Educ. Psychol.* 37, 506–519. doi: 10.1080/01443410.2016.1152355

Fwu, B. J., Wei, C. F., Chen, S. W., and Wang, H. H. (2021). "To work hard or not? The conflicting effects of negative emotions on persistence after academic failure in a Confucian-heritage cultural context," in *Emotions in education: Asian insights on emotions in learning, teaching, and leadership*. eds. J. Chen and R. B. King (New York: Routledge), 3–17.

Georgiou, S. N., Christou, C., Stavrinides, P., and Panaoura, G. (2002). Teacher attributions of student failure and teacher behavior toward the failing student. *Psychol. Sch.* 39, 583–595. doi: 10.1002/pits.10049

Graham, S. (1984). Communicating sympathy and anger to black and white children: the cognitive (attributional) consequences of affective cues. *J. Pers. Soc. Psychol.* 47, 40–54. doi: 10.1037/0022-3514.47.1.40

Graham, S., and Barker, G. P. (1990). The downside of help: an attributional-developmental analysis of help-giving as a low ability cue. *J. Educ. Psychol.* 82, 7–14. doi: 10.1037/0022-0663.82.1.7

Guo, Y. (2013). Consultant report. Securing Australia's future STEM: Country comparisons. Report of Taiwan: STEM (Science, Technology, Engineering and Mathematics). Available at: https://acola.org/wp-content/uploads/2018/12/Consultant-Report-Taiwan.pdf

Hattie, J. A. C. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York, NY: Routledge.

Heine, S. J., Kitayama, S., Lehman, D. R., Takata, T., Ide, E., Leung, C., et al. (2001). Divergent motivational consequences of success and failure in Japan and North America. *J. Pers. Soc. Psychol.* 81, 599–615. doi: 10.1037//0022-3514.81.4.599

Henrich, J., Heine, S. J., and Norenzayan, A. (2010). The weirdest people in the world? *Behav. Brain Sci.* 33, 61–83. doi: 10.1017/S0140525X0999152X

Hwang, K. K. (2005). A philosophical reflection on the epistemology and methodology of indigenous psychologies. *Asian J. Soc. Psychol.* 8, 5–17. doi: 10.1111/j.1467-839X.2005.00153.x

Hwang, K. K. (2010). The implication of Popper's anti-inductive theory for the development of indigenous psychologies. *Psychol. Stud.* 55, 390–394. doi: 10.1007/s12646-010-0050-1

Hwang, K. K. (2012). *Foundations of Chinese psychology: Confucian social relations*. New York, NY: Springer.

Karjanto, N., and Simon, L. (2019). English-medium instruction calculus in Confucian-heritage culture: flipping the class or overriding the culture? *Stud. Educ. Eval.* 63, 122–135. doi: 10.1016/j.stueduc.2019.07.002

Kennedy, K. J., Chan, J. K. S., Fok, P. K., and Yu, W. M. (2008). Forms of assessment and their potential for enhancing learning: conceptual and cultural issues. *Educ. Res. Policy Prac.* 7, 197–207. doi: 10.1007/s10671-008-9052-3

Lanza, S. T., Collins, L. M., Lemmon, D. R., and Schafer, J. L. (2007). PROC LCA: a SAS procedure for latent class analysis. *Struct. Equ. Model. Multidiscip. J.* 14, 671–694. doi: 10.1080/10705510701575602

Lee, J. (2009). Universals and specifics of math self-concept, math self-efficacy, and math anxiety across 41 PISA 2003 participating countries. *Learn. Individ. Differ.* 19, 355–365. doi: 10.1016/j.lindif.2008.10.009

Leong, W. S., Ismail, H., Costa, J. S., and Tan, H. B. (2018). Assessment for learning research in east Asian countries. *Stud. Educ. Eval.* 59, 270–277. doi: 10.1016/j.stueduc.2018.09.005

Li, J. (2002). A cultural model of learning: Chinese "heart and mind for wanting to learn". *J. Cross-Cult. Psychol.* 33, 248–269. doi: 10.1177/0022022102033003003

Li, J. (2005). Mind or virtue: Western and Chinese beliefs about learning. *Curr. Dir. Psychol. Sci.* 14, 190–194. doi: 10.1111/j.0963-7214.2005.00362.x

Li, J. (2012). *Cultural Foundations of Learning: East and West*. New York, NY: Cambridge University Press.

Liu, C.-H., Chiu, Y.-H. C., and Chang, J. H. (2017). Why do Easterners have lower well-being than Westerners? The role of others' approval contingencies of self-worth in the cross-cultural differences in subjective well-being. *J. Cross Cult. Psychol.* 48, 217–224. doi: 10.1177/0022022116677580

Lou, N. M., and Noels, K. A. (2020). "Does my teacher believe I can improve?": the role of meta-lay theories in ESL learners' mindsets and need satisfaction. *Front. Psychol.* 11:1417. doi: 10.3389/fpsyg.2020.01417

Meadon, M., and Spurrett, D. (2010). It's not just the subjects—there are too many WEIRD researchers. *Behav. Brain Sci.* 33, 104–105. doi: 10.1017/S0140525X10000208

Morony, S., Kleitman, S., Lee, Y. P., and Stankov, L. (2013). Predicting achievement: confidence vs self-efficacy, anxiety, and self-concept in Confucian and European countries. *Int. J. Educ. Res.* 58, 79–96. doi: 10.1016/j.ijer.2012.11.002

Mullis, I. V. S., Martin, M. O., Foy, P., Kelly, D. L., and Fishbein, B. (2020). TIMSS 2019 international results in mathematics and science. Boston College, TIMSS & PIRLS International Study Center. Available at: https://timssandpirls.bc.edu/timss2019/international-results/

Peng, K., Nisbett, R. E., and Wong, N. Y. C. (1997). Validity problems comparing values across cultures and possible solutions. *Psychol. Methods* 2, 329–344. doi: 10.1037/1082-989X.2.4.329

Pollet, T. V., and Saxton, T. K. (2019). How diverse are the samples used in the journals 'Evolution & Human Behavior' and 'evolutionary psychology'? *Evol. Psychol. Sci.* 5, 357–368. doi: 10.1007/s40806-019-00192-2

Raffaelli, M., Lazarevic, V., Koller, S. H., Nsamenang, A. B., and Sharma, D. (2013). Introduction: special issue on adolescents in the majority world. *J. Res. Adolesc.* 23, 1–8. doi: 10.1111/jora.12000

Rattan, A., Good, C., and Dweck, C. S. (2012). "It's ok-not everyone can be good at math": instructors with an entity theory comfort (and demotivate) students. *J. Exp. Soc. Psychol.* 48, 731–737. doi: 10.1016/j.jesp.2011.12.012

Ryan, E., Shuai, X., Ye, Y., Ran, Y., and Haomei, L. (2014). When Socrates meets Confucius: teaching creative and critical thinking across cultures through multilevel Socratic method. *Nebraska Law Rev.* 92, 289–348.

Schleicher, A. (2019). PISA 2018: insights and interpretations. Available at: https://www.oecd.org/pisa/PISA%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf

Sinha, D. (1986). *Psychology in a Third World Country: The Indian Experience*. New Delhi: Sage.

Stankov, L. (2013). Depression and life satisfaction among European and Confucian adolescents. *Psychol. Assess.* 25, 1220–1234. doi: 10.1037/a0033794

Tan, J. B., and Yates, S. (2011). Academic expectations as sources of stress in Asian students. *Soc. Psychol. Educ.* 14, 389–407. doi: 10.1007/s11218-010-9146-7

Taxer, J. L., and Frenzel, A. C. (2020). Brief research report: the message behind teacher emotions. *J. Exp. Educ.* 88, 595–604. doi: 10.1080/00220973.2019.1588699

Thanh Pham, T. H., and Renshaw, P. (2015). Formative assessment in Confucian heritage culture classrooms: activity theory analysis of tensions, contradictions and hybrid practices. *Assess. Eval. High. Educ.* 40, 45–59. doi: 10.1080/02602938.2014.886325

Torrance, H. (2012). Formative assessment at the crossroads: Conformative, deformative and transformative assessment. *Oxf. Rev. Educ.* 38, 323–342. doi: 10.1080/03054985.2012.689693

Wang, S. H. (1998). The role of teachers' comment and children's attributional process in effort vs. ability perception. Unpublished master's thesis. Taipei: National Taiwan University (in Chinese).

Weiner, B. (2010). Attribution theory. International encyclopedia of. *Education* 6, 558–563. doi: 10.1002/9780470479216.corpsy0098

Wilkins, J. M. (2004). Mathematics and science self-concept: an international investigation. *J. Exp. Educ.* 72, 331–346. doi: 10.3200/JEXE.72.4.331-346

Yang, T. R., Chen, Y. K., and Fwu, B. J. (2021a). Entity belief vs. obligation belief in Confucian-heritage cultures: development and validation of a measurement instrument [Paper presentation]. Asian Association of Social Psychology 14th Biennial Conference, Seoul, Korea.

Yang, T. R., Chen, Y. K., and Fwu, B. J. (2021b). Failure attribution scale construction: lack of ability, lack of exertion, and lack of strategy [Paper presentation]. Asian Association of Social Psychology 14th Biennial Conference, Seoul, Korea.

Yang, L., and Yang, M. (2018). "Exploring the power of teacher feedback in Chinese students: testing the relationships between students' feedback beliefs and student engagement" in *Asian Education Miracles: In Search of Sociocultural and Psychological Explanations*. eds. G. A. D. Liem and S. H. Tan (New York: Routledge), 155–173.

Zhang, M., and Cross, S. E. (2011). Emotions in memories of success and failure: a cultural perspective. *Emotion* 11, 866–880. doi: 10.1037/a0024025

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Mobility, independent agency, and cosmopolitan settlement: Evidence from Chinese senior undergraduates

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Cosmopolitan cities share similarities with historical frontiers, including potential opportunities for economic success, high social mobility, weakened traditional conventions, and adventure and novel experiences. Individuals with high independence typically prefer to settle in cosmopolitan cities. However, previous research testing this cosmopolitan settlement hypothesis did not consider the influence of relational mobility and residential mobility. Moreover, the mechanisms that drive people to prefer cosmopolitan cities remain unclear. This study examines the relationships among independence, relational mobility, residential mobility, and preference for cosmopolitan cities among 296 Chinese senior undergraduates. The results indicate that: (1) independence remains a positive predictor of the preference for cosmopolitan cities above and beyond relational mobility, residential mobility (i.e., history, state, and intention), and other covariates; (2) intention of residential mobility also positively predicts preference for cosmopolitan cities when controlling for related covariates; and (3) relational mobility indirectly predicts perceived preference for cosmopolitan cities through dependence. This research underscores the importance of identifying the factors and mechanisms affecting cosmopolitan settlement.

KEYWORDS

Chinese, cosmopolitanism, voluntary settlement, independence, relational mobility, residential mobility

1 Introduction

People are progressively moving to more economically developed regions that provide greater employment opportunities, wages, social resources, self-fulfillment, and novel experiences (Sevincer et al., 2017; Su et al., 2019; Liu and Yuan, 2022). In China, a great number of people are moving from rural regions to metropolitan centers, such

as Beijing, Shanghai, Guangzhou, and Shenzhen, as a result of the reform and opening up, as well as urbanization. By the end of 2021, China's urban population was 914.25 million, with an urbanization rate of 64.72% (Xinhuanet, 2021), and a large number of people are still moving to cities from rural regions every year (Zuo et al., 2022). Based on recent investigations (Zeng et al., 2021; Xie et al., 2022), Chinese college graduates and senior undergraduates tend to choose to work in first- and second-tier cities, or big and medium cities with greater economic levels. In this paper, we consider this development from the perspective of social-ecological psychology and ask why Chinese senior undergraduates exhibit this preference.

1.1 Voluntary frontier settlement hypothesis

Studies of the "Western Frontier" in the United States during the 18th and 19th centuries, Japan's "Northern Frontier" (i.e., Hokkaido), China's Chuang Guangdong movement and China's ongoing "Southern Frontier" (i.e., Shenzhen) reveal possible reasons for the preference for cosmopolitan cities among Chinese college graduates and senior undergraduates (Kitayama et al., 2006, 2009; Feng et al., 2017; Bai and Ren, 2021). The voluntary frontier settlement hypothesis not only argues that the frontiers offered more opportunities for individuals to pursue wealth and freedom, attracting a large number of voluntary migrants with independent orientation, but also that these immigrants were an important factor in the formation of an individualistic culture in the chosen settlement regions (Kitayama et al., 2006, 2009). Independent self-construal is an essential component of a perspective of the self that is separate from social context. Individuals with high independence define themselves in accordance with their internal attributes and traits, emphasizing personal qualities and successes (Markus and Kitayama, 1991). Previous studies have shown that people in the western United States, where there were more early pioneers, had a higher independent self-construal than those in the eastern United States, as indicated by a greater emphasis on self-direction, universality, and stimulation (Kitayama et al., 2010); a higher percentage of people living alone; more self-employment (Vandello and Cohen, 1999); and a lower tendency to change their views due to social norms or external pressures (Varnum, 2012). Research has found that the voluntary settlement hypothesis can also be applied to collectivistic Eastern cultures. For instance, in the early 20th century, large numbers of mainland Japanese voluntarily migrated to Hokkaido, Japan's northernmost island. Hokkaido's residents have been shown to be more independent than mainland-born Japanese (Kitayama et al., 2006; Ishii, 2014). In China, Chuang Guangdong movement, in which millions of people settled in the northeastern region of China during the 19th and 20th centuries, led to the formation of the China's "Northeast Frontier." Research shows that people from the northeast of China (e.g., Heilongjiang) reported more self-centric and less in-group favoritism, and are more likely to give babies unique names than those in Shandong (Bai and Ren, 2021). Moreover, since the 1980s, many Chinese inland residents have willingly moved to Shenzhen, which is situated on the southernmost part of Guangdong Province and is near Hong Kong, seeking better career and economic opportunities. Shenzhen has been considered an ongoing voluntary frontier settlement, and research indicates that Shenzhen's residents are more independent than those of other mainland cities (e.g., Foshan, Wuhan, and Xiangfan; Chen et al., 2016, 2019; Feng et al., 2017; Luo and Ren, 2018). Overall, these studies provide evidence of the voluntary frontier settlement hypothesis, which holds that individuals who have a strong sense of independence are more willing to relocate to regions with more opportunities to pursue personal wealth and freedom.

1.2 Cosmopolitan settlement hypothesis

The western regions of the United States, Hokkaido in Japan, and three provinces in northeast China and Shenzhen in China are all located in the frontier areas of their respective nations, where the physical or social environment is more strenuous than that of one's hometown. It is becoming increasingly more difficult to find topographical frontiers as a result of rising modernization. Recently, Sevincer et al. (2015) proposed that the cosmopolitan city is the contemporary world's frontier. Although cosmopolitan cities have larger populations and better infrastructure and institutions than the historical frontiers, the two types of settlements do share some similarities. For instance, they not only provide more opportunities for success, as well as novel and adventurous experiences, but also exhibit high social mobility and few conventional customs (Sevincer et al., 2015). Therefore, researchers have argued that modern cosmopolitan cities are also attractive to individuals with a high independent orientation (Sevincer et al., 2015). Research conducted in Germany (Sevincer et al., 2015) has shown that students who wanted to move to a cosmopolitan city (i.e., Berlin) had higher levels of independent self-construal than those who wanted to move to a smaller city (i.e., Braunschweig). Moreover, priming university students with an independent mindset increased their choice of a cosmopolitan city and their inclination to relocate to a new city. Furthermore, university students who relocated to a cosmopolitan city (i.e., Berlin) had a greater number of personal goals and a higher demand for being unique than their counterparts who relocated to a non-cosmopolitan city (i.e., Braunschweig) and those who stayed put (i.e., local students in Berlin and Braunschweig).

Sevincer et al. (2017, 2021) proposed four distinguishing characteristics of cosmopolitan cities, including social

diversity, innovativeness, equality, and more economic opportunities. Using this conceptual framework, they developed the Cosmopolitan City Scale (CCS) to measure how cosmopolitan individuals perceive certain cities (Sevincer et al., 2017). Research based on samples from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies has also shown that perceived cosmopolitanism is significantly and positively linked to measures of objective cosmopolitanism (e.g., proportions of self-employed workers, minorities, foreign-born inhabitants, LGBTQ + population, high-tech index, number of museums, and per capita income) and risk-taking (Sevincer et al., 2017, 2021). Moreover, individuals with greater degrees of independent self-construal or risk-taking have been shown to prefer living in cosmopolitan cities. Independent self-construal or risk-taking still predicted preference for cosmopolitan cities after controlling for demographic variables and personality traits (Sevincer et al., 2017, 2021). These findings provided preliminary evidence for the cosmopolitan settlement hypothesis in individualistic Eastern cultures. However, there is scarce evidence supporting the cosmopolitan settlement hypothesis in collectivistic Eastern cultures.

More importantly, researchers have argued that testing the voluntary settlement hypothesis should take mobility into account (Feng et al., 2017; Luo and Ren, 2018). Further, we know little about the association between mobility and preference for cosmopolitan cities. Following this logic, we systematically control for the effects of residential and relational mobility—two socio-ecological characteristics that have received substantial attention (Oishi et al., 2015; Yuki and Schug, 2020; Oishi and Tsang, 2022). Relational mobility refers to the extent to which people can develop new connections and exit from unfavorable relationships (Oishi and Tsang, 2022). In high-relational-mobility societies, individuals have various opportunities to engage with new people, choose which groups to join, and leave long-standing and dissatisfying relationships. In contrast, in low-relational-mobility societies, individuals have less freedom to pick new partners or walk away from current relationships because interpersonal and group connections are more likely to be stable (Schug et al., 2010; Yuki and Schug, 2012; Thomson et al., 2018). Studies have shown that individuals from the high-relational-mobility environment have an increased tendency to be extroverted and to engage in self-improvement (Falk et al., 2009; Kim et al., 2018). It has also been shown that high-relational-mobility promotes the formation and maintenance of voluntary ties with other people, as well as the increased integration of various social networks (Thomson et al., 2018; Li et al., 2022). As cosmopolitan cities are full of social diversity, innovativeness, equality, and economic opportunities, people who live in high-relational-mobility societies are inclined to relocate to cosmopolitan cities.

Residential mobility involves the frequency with which people move from one residence to another (Oishi and Tsang, 2022). As residential mobility often brings about significant changes in the physical and interpersonal environment, it is considered an important socio-ecological factor (Oishi, 2014; Oishi and Tsang, 2022). It has been demonstrated that frequently changing one's residence affects relationship preferences and patterns, leading a person to favor broader social networks, more open interaction, and lower-commitment groups (Oishi and Tsang, 2022). In turn, relationship styles and preferences might make individuals from high-residential-mobility communities inclined to move to cosmopolitan cities. Research has shown that individuals with high residential mobility tend to have a broader global identity and view themselves as global citizens (Borschel et al., 2019; Wang et al., 2021). Residential mobility also refers to the intention to move in the future (Zuo et al., 2018; Choi and Oishi, 2020). Research has indicated that the expectation of future residential mobility rather than a history of it significantly predicted decreased subjective wellbeing, high insecurity, and materialism among Chinese undergraduates (Meng and Xie, 2019; Zhou and Xie, 2019). Therefore, if we consider the effects of relational and residential mobility, we can expect a robust connection between independent self-construal and a preference for cosmopolitan cities.

Because subjective social status, gender, urban resident, and being an only child may influence one's residential preferences (Murray, 2012; Wen et al., 2020; Xie et al., 2022), we also controlled for these demographic variables. Moreover, as individuals might choose to relocate to a city that resembles or is near their hometown or the city where their university is located (Sevincer et al., 2015, 2017, 2021), we also measure the objective cosmopolitanism of their hometown and university cities, as well as the distance between their intended destination city and their hometown and university cities. This made it possible to evaluate the association between independent self-construal and preference for a cosmopolitan city above and beyond these covariates.

1.3 The current research

In summary, this study first examined the connection between independent self-construal and a preference for cosmopolitan cities among selected Chinese senior undergraduates who are looking for their first job, after factoring in the effects of the abovementioned covariates. We test the following hypothesis:

> **Hypothesis 1.** Dependence is linked to an increased preference for cosmopolitan cities above and beyond the effects of demographic variables (i.e., gender, being an only child, urban resident, and subjective social status),

the objective cosmopolitanism of one's hometown and university city, distance between their destination city and both their hometown and university, and relational and residential mobility.

Second, we also investigated the association between mobility (i.e., relational and residential mobility) and a preference for cosmopolitan cities among selected Chinese senior under, after factoring in the effects of the abovementioned covariates and dependence. We test the following hypothesis:

> **Hypothesis 2.** Mobility (i.e., relational and residential mobility) is linked to an increased preference for cosmopolitan cities above and beyond the effects of demographic variables (i.e., gender, being an only child, urban resident, and subjective social status), the objective cosmopolitanism of one's hometown and university city, distance between their destination city and both their hometown and university, and dependence.

Third, the mechanisms that lead to a preference for cosmopolitan cities remain unclear. We propose that independence may account for the links between mobility variables (relational and residential mobility) and preference for cosmopolitan cities. Our hypothesis corroborates prior assertions that mobility might contribute to the formation of one's independent orientation (Choi and Oishi, 2020; Yuki and Schug, 2020; Oishi and Tsang, 2022). For instance, research has shown that individuals with high residential mobility during their childhood have a tendency to place a greater emphasis on their personal self (e.g., personality traits), while placing less emphasis on their collective self (e.g., group membership; Oishi et al., 2007). Likewise, a recent study also has demonstrated that higher residential mobility can result in greater concern for self-interest, which refers to an instrumental concern with maximizing one's benefits (Chen et al., 2022). Moreover, high relational mobility has been shown to be positively linked to high independence (Feng et al., 2017; Thomson et al., 2018; San Martin et al., 2019). Therefore, we examined the following hypothesis:

> **Hypothesis 3.** Mobility (i.e., relational and residential mobility) have indirect effects on preference for cosmopolitan cities *via* dependence, above and beyond the effects of demographic variables (i.e., gender, being an only child, urban resident, and subjective social status), the objective cosmopolitanism of one's hometown and university city, and distance between one's destination city and their hometown and university cities.

2 Materials and methods

2.1 Participants

Using the convenience sampling strategy, 330 undergraduates from four universities in Guangdong (i.e., Guangzhou and Zhaoqing), Guizhou (i.e., Zunyi), and Heilongjiang (i.e., Harbin) provinces, who were entering their senior year, were invited to complete online questionnaires through Wenjuanxin, an online survey platform, during November and December 2019. Before voluntarily answering a series of survey questions, the participants completed permission forms and were assured that their responses would be confidential and used only for academic purposes. First, participants were asked to choose the top two cities in which they most preferred to live and work after graduation. We also used the CCS to assess each city's perceived cosmopolitanism. Then, participants completed the Singelis Self-Construal Scale, the Relationship Mobility Scale, the Scale of Personal Residential Mobility, and demographic information (i.e., gender, age, siblings, ethnicity, highest educational attainment of parents, hometown, and the city where their university is located). Finally, we matched the objective cosmopolitanism of participants' preferred cities, hometowns, and university cities, as well as the distance between their destination city and hometown or university cities.

To reduce the impact of random replies or inattention, the online questionnaire contained two validity check questions (e.g., "Please indicate 'strongly agree' for this item"). Only individuals who answered these two validity check questions correctly were included in the final sample (N = 294, or 89.70%). The participants' ages varied from 21 to 25 years (M_{age} = 21.71 years, SD = 0.77 years), and the majority were female (79.6%, n = 234), of Han ethnicity (94.6%, n = 278), urban (56.1%, n = 165), and had at least one sibling (60.2%, n = 177). Regarding their parents' level of education, the majority had completed secondary education (66.67%, n = 196), while the remainder had completed either higher education (22.79%, n = 67) or primary education (10.54%, n = 31).

2.2 Measures

2.2.1 Preference for cosmopolitan cities

The CCS is a unidimensional scale that evaluates an individual's perceptions of the cosmopolitanism of a city and their preference for cosmopolitan cities (Sevincer et al., 2017). This scale includes nine items, and participants rate each item (e.g., "is tolerant toward minority groups groups"), from 1 (strongly disagree) to 7 (strongly agree). The English version of the CCS was translated into Chinese. In this

study, 294 participants used the CCS to evaluate 70 cities in which they most preferred to work. The one-factor model indicated an adequate level of fit to the data (χ^2 = 386.02, *df* = 27, comparative fit index [CFI] = 0.92, Tucker-Lewis index [TLI] = 0.89, root mean square error [RMSEA] = 0.15). All factor loadings were statistically significant, varying between 0.74 and 0.87. The Cronbach's alpha coefficient for the top five cities' (Guangzhou, Shenzhen, Shanghai, Beijing, Hangzhou) CSS total scores ranged from 0.91 to 0.95, and the Cronbach's alpha coefficient for the CSS total score of all cities was 0.94. In terms of criterion validity, perceived cosmopolitanism was positively correlated with objective cosmopolitanism (i.e., city business attractiveness; $r = 0.42$, $p < 0.001$).

2.2.2 Dependence

The Chinese version of the Singelis Self-Construal Scale was used to explicitly assess independence and interdependence (Singelis, 1994; Feng et al., 2017). This scale includes two subscales of independent (12 items; e.g., "I act the same way no matter who I am with") and interdependent (12 items; e.g., "It is important for me to maintain harmony within my group"). Each item is evaluated using a seven-point scale, from 1 (strongly disagree) to 7 (strongly agree). In this study, only the independence subscale was used, and higher scores indicate higher independent orientation. The internal consistency coefficient of the independent subscale in this study was 0.71.

2.2.3 Relational mobility

Relational mobility was measured using the 12-item Relationship Mobility Scale developed by Yuki et al. (2007), see also Thomson et al. (2018). This measure asks participants to express their perceptions of other people creating new connections and terminating existing ones in their surrounding society, using a six-point scale from 1 (strongly disagree) to 6 (strongly agree). Example items include, "They have many chances to get to know other people." Higher scores indicate a higher level of relational mobility in their surrounding society. The internal consistency coefficient of the total scale in this study was 0.87.

2.2.4 Residential mobility

Residential mobility was evaluated using the Scale of Personal Residential Mobility (Zuo et al., 2018). This measure assesses residential mobility from three time perspectives: history (six items; e.g., "I have changed my residence many times from birth to now"), state (six items; e.g., "I have lived in my current residence for a very long time"), and intention (six items; e.g., "Moving to other areas is a good idea"). Participants were asked to rate the statements according to their level of agreement, from 1 (completely disagree) to 7 (completely agree). Cronbach's alpha values for the history, state, and intention scales were 0.80, 0.73, and 0.80, respectively.

2.2.5 Objective cosmopolitanism of hometown and university cities, and distances between the destination city and the hometown and university cities

We use the ranking of cities' business attractiveness 2019 in China released by the Rising Lab on May 24, 2019 (The Rising Lab, 2019) to measure objective cosmopolitanism. The rankings consider "the concentration of commercial resources, connectivity, urban residents' activity, diversity of lifestyle, and future potential based on commercial data from 170 major consumer brands, user behavior data from 17 leading internet firms, and urban big data" (Yicai Global, 2021). Higher business attractiveness indicates a higher level of business development in the city. We matched the business attractiveness of participants' preferred cities, hometowns, and university cities. We also use the Haversine formula to calculated the distance ($Distance_{ij}$) between their destination city ($City_i$) and their hometown and university cities ($City_j$) based on each city's latitude and longitude (Sinnott, 1984; Jensen et al., 2015; Yuan and Zhou, 2021). Each city's latitude and longitude were collected from Geo Data Source,[1] and r is equals to 3,963 miles.

$$\begin{aligned} Distance_{ij} = \arccos\{&\cos(\text{latitude}_i)\cos(\text{longitude}_i)\cos(\text{latitude}_j) \\ &\cos(\text{longitude}_j) + \cos(\text{latitude}_i)\sin(\text{longitude}_i) \\ &\cos(\text{latitude}_j)\ \sin(\text{longitude}_j) + \sin(\text{latitude}_i) \\ &\sin(\text{latitude}_j)\}2\pi\ r/360. \end{aligned}$$

2.2.6 Subjective social status

The MacArthur Scale of Subjective Social Status tests how individuals feel about their own social status by showing them a photograph of a "social ladder" with ten rungs. Individuals are invited to choose the step that most accurately defines their social status in their community. A higher position on the ladder indicates a greater social status. According to previous studies, subjective social status has a positive correlation with one's income, occupation, and level of education (Operario et al., 2004; Hu et al., 2012).

2.2.7 Analytical strategy

First, we performed descriptive statistics and Pearson correlational analyses between the key variables using SPSS 25.0. Next, to investigate Hypothesis 1 and Hypothesis 2, we performed hierarchical multiple regression analyses using the perceived cosmopolitanism of the first and second favored cities as the dependent variable. Finally, to examine Hypothesis 3, we used Model 4 of the PROCESS macro in SPSS 25.0 (Hayes,

1 https://www.geodatasource.com/demo

2013). We also performed bootstrapping with 5,000 samples to ascertain the mediation effect. As recommended by researchers (Preacher and Hayes, 2008; Owens and Hekman, 2016), there is a substantial mediation effect at the level of $\alpha = 0.05$ if the bias-corrected bootstrap 95% confidence interval (CI) does not contain zero.

3 Results

3.1 Descriptive statistics and pearson correlational analyses

Table 1 provides descriptive statistics of the variables. The perceived cosmopolitanism of the first and second preferred cities was significantly and positively correlated with independence and relationship mobility. The perceived cosmopolitanism of the first preferred city was significantly and negatively associated with history and with state of residential mobility but not intention of residential mobility. The perceived cosmopolitanism of the second preferred city was significantly and negatively linked to state of residential mobility and positively linked to intention of residential mobility. However, the association between the perceived cosmopolitanism of the second preferred city and history of residential mobility was not significant and was close to zero.

3.2 Results of regression analyses and mediation analysis

3.2.1 The first preferred city

In the first stage, we entered demographic variables (i.e., gender, being an only child, urban resident, and subjective social status), objective cosmopolitanism of one's hometown and university cities, and distances between the destination city and the hometown and university cities. These variables explained 8.7% of the variance (Table 2). In the second stage, relational mobility and residential mobility (i.e., history, state, and intention) were added, which explained an additional 6.6% of the variance. As shown in Table 2, state and intention of residential mobility, rather than history of residential mobility and relational mobility, significantly predicted a preference for cosmopolitan cities. In the third stage, independence was added, explaining an additional 2.7% of the variance. As presented in Table 2, independence significantly and positively predicted a preference for cosmopolitan cities. Moreover, when we included dependence in the second stage and relational mobility and residential mobility (i.e., history, state, and intention) in the third stage, dependence explained an additional 4% of the variance, and the mobility variables an additional 5.3%. As described in Table 2, state and intention of residential mobility significantly predicted a preference for cosmopolitan cities above and beyond independence.

The results of Model 4 are presented in Figure 1. Relational mobility ($\beta = 0.37$, $p < 0.001$) rather than history ($\beta = -0.05$, $p > 0.05$), state ($\beta = -0.03$, $p > 0.05$), and intention ($\beta = -0.01$, $p > 0.05$) of residential mobility significantly predicted independence. Independence ($\beta = 0.18$, $p < 0.01$), as well as state ($\beta = -0.16$, $p < 0.05$) and intention ($\beta = 0.15$, $p < 0.05$) of residential mobility, rather than history of residential mobility ($\beta = -0.07$, $p > 0.05$) and relational mobility ($\beta = 0.04$, $p > 0.05$), significantly predicted perceived cosmopolitanism. Furthermore, the results of the mediation analysis demonstrated that the indirect effect of relational mobility on the preference for cosmopolitan cities *via* dependence was statistically significant, as the bias-corrected bootstrap 95% CI excluded zero ($\beta = 0.07$; Boot SE = 0.03; 95% CI = [0.01, 0.12]). By contrast, the indirect effect of history ($\beta = -0.01$; Boot SE = 0.01; 95% CI = [−0.04, 0.14]), state ($\beta = -0.01$; Boot SE = 0.01; 95% CI = [−0.02, 0.03]), and intention ($\beta = 0.01$; Boot SE = 0.01; 95% CI = [−0.02, 0.03]) of residential mobility on the preference for cosmopolitan cities through dependence was not statistically significant, as the bias-corrected bootstrap 95% CI included zero.

TABLE 1 Descriptive statistical and correlation analysis for each variable.

Variables	*M*	*SD*	1	2	3	4	5	6	7
1. CCS1	5.88	0.88	1						
2. CCS2	5.79	0.86	0.52***						
3. Independence	4.74	0.67	0.22***	0.21***					
4. Relational mobility	4.85	0.98	0.16**	0.21***	0.35***				
5. History	2.60	1.32	−0.13*	−0.07	−0.03	0.06			
6. State	2.47	1.06	−0.16**	−0.16**	−0.04	−0.08	0.49***		
7. Intention	4.34	1.20	0.10	0.13*	0.05	0.06	0.09	0.08	1

CCS1 = perceived cosmopolitanism of the first preferred city; CCS2 = perceived cosmopolitanism of the second preferred city; History = history of residential mobility; State = state of residential mobility; Intention = intention of residential mobility.
***$p < 0.001$, **$p < 0.01$, and *$p < 0.05$.

TABLE 2 Results of hierarchical regression analyses for dependence, mobility, and other covariates predicting preference for cosmopolitan cities (the first preferred city).

Variable	*B*	*SE*	β	R^2	*CM*	Δ R^2
Step 1				0.087		0.087
Gender (boy = 1, girl = 0)	0.04	0.13	0.02			
Being an only child	0.04	0.12	0.02			
Urban resident	−0.03	0.12	−0.02			
Subjective social status	0.04	0.03	0.08			
CBA of hometown	0.01	0.01	0.25***			
CBA of university	0.01	0.01	0.05			
Distance city-hometown	0.01	0.01	0.21**			
Distance city-university	−0.01	0.01	−0.07			
Step 2a				0.127	2a-1	0.04
Relational mobility	0.10	0.05	0.11			
History of residential mobility	−0.05	0.04	−0.08			
State of residential mobility	−0.12	0.06	−0.15*			
Intention of residential mobility	0.11	0.04	0.15*			
Step 2b				0.153	2b-1	0.066
Independence	0.26	0.07	0.20***			
Step 3				0.305	3-2a	0.053
					3-2b	0.027
Relational mobility	0.04	0.06	0.04			
History of residential mobility	−0.05	0.04	−0.07			
State of residential mobility	−0.13	0.06	−0.15*			
Intention of residential mobility	0.11	0.04	0.15*			
Independence	0.23	0.08	0.18**			

CBA of hometown = city of hometown, business attractiveness; CBA of university = city of university, business attractiveness; Distance city-hometown = distance between the first preferred city and hometown; Distance city-university = distance between the first preferred city and university.
***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

3.2.2 The second preferred city

Similarly, in the first stage, demographic variables (i.e., gender, being an only child, urban resident, and subjective social status), objective cosmopolitanism of hometown and university cities, and distance between the destination city and the hometown and university cities were included as covariates; they explained 10.9% of the variance. In the second step, the mobility measures were entered and explained an additional 5.7% of the variance. As shown in Table 3, only relational mobility and intention of residential mobility predicted a preference for cosmopolitan cities. In the third stage, independence was added, which explained an additional 1.5% of the variance. As presented in Table 3, independence significantly and positively predicted a preference for cosmopolitan cities. Moreover, when we entered dependence in the second stage and the mobility variables in the third stage, dependence explained an extra 3.1% of the variance, and the mobility variables an additional 4.1%. As described in Table 3, only intention of residential mobility predicted a preference for cosmopolitan cities above and beyond dependence.

The results of Model 4 are shown in Figure 2. Relational mobility (β = 0.37, $p < 0.001$) rather than history (β = −0.06, $p > 0.05$), state (β = −0.04, $p > 0.05$), and intention (β = −0.01, $p > 0.05$) of residential mobility significantly predicted independence. Independence (β = 0.13, $p < 0.05$), relational mobility (β = 0.10, $p < 0.05$), and intention of residential mobility (β = 0.09, $p < 0.05$), rather than history (β = −0.04, $p > 0.05$), and state (β = −0.10, $p > 0.05$) of residential mobility, predicted a preference for cosmopolitan cities. Furthermore, the results of the mediation analysis showed that the indirect effect of relational mobility on the preference for cosmopolitan cities *via* dependence was statistically significant, as the bias-corrected bootstrap 95% CI excluded zero (β = 0.05; Boot SE = 0.02; 95% CI = [0.01, 0.10]). By contrast, the indirect effect of history (β = −0.01; Boot SE = 0.01; 95% CI = [−0.03, 0.10]), state (β = −0.01; Boot SE = 0.01; 95% CI = [−0.01, 0.03]), and intention (β = 0.01; Boot SE = 0.01; 95% CI = [−0.02, 0.02]) of residential mobility on the preference for cosmopolitan cities through dependence was not statistically significant, as the bias-corrected bootstrap 95% CI included zero.

4 Discussion

Based on a particular variant of the voluntary settlement hypothesis—the cosmopolitan settlement hypothesis—and the socio-ecological perspective in cultural psychology (Oishi et al., 2015; Sevincer et al., 2015, 2017; Oishi and Tsang, 2022), this study examined the relationships among relational mobility, personal residential mobility, independence, and Chinese senior undergraduates' preference for cosmopolitan cities. The current study makes three contributions. First, to our knowledge, this is the first research to investigate the cosmopolitan settlement hypothesis in collectivistic Eastern cultures. Compared with prior studies (Sevincer et al., 2015, 2017) that examined adults or undergraduates from WEIRD societies, our study recruited Chinese senior undergraduates, who were choosing or would eventually choose their place of employment for the first time. Our research also systematically accounted for the effects of relational mobility and personal residential mobility. Thus, our study provides relatively robust evidence for the cosmopolitan settlement hypothesis in a collectivistic culture.

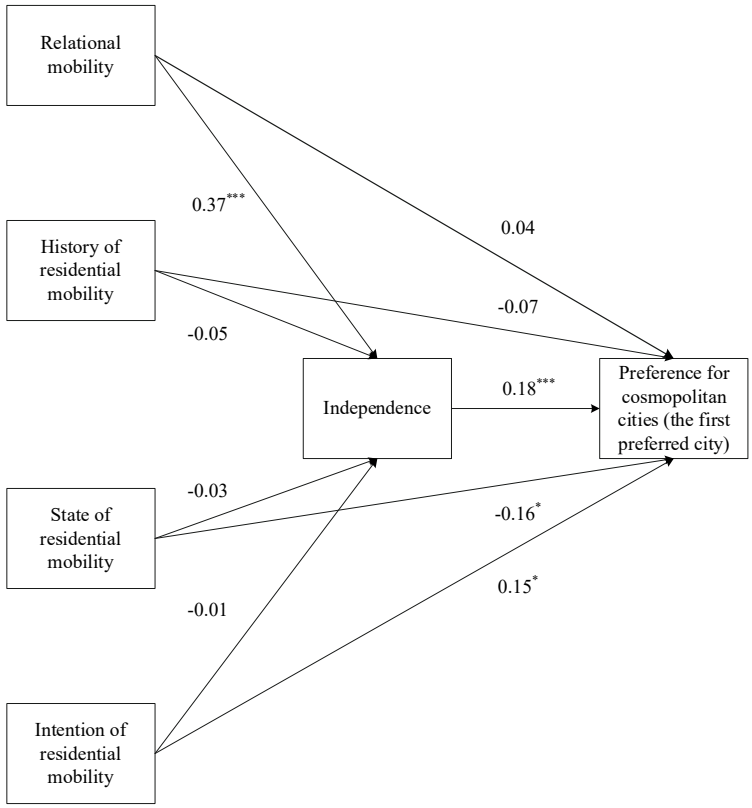

FIGURE 1
The mediating role of independence in the association between mobility and preference for cosmopolitan cities (the first preferred city), with standardized coefficients. Results of covariates are not shown for the purpose of simplicity; ***$p < 0.001$, *$p < 0.05$.

Second, we also validated intention of residential mobility as a potential predictor of preference for cosmopolitan cities, which is unrecognized in previous work. Third, our research enhanced our knowledge of the mechanisms underlying relational mobility and Chinese senior undergraduates' preference for cosmopolitan cities, with independent self-construal serving as the mediator. Overall, we extend previous psychological research on predictors of preference for cosmopolitan cities, from belief (e.g., Sevincer et al., 2015, 2017) and personality (Sevincer et al., 2017, 2021) to socioecological factors such as residential and relational mobility.

Consistent with Hypothesis 1, our results showed that dependence remained associated with a preference for cosmopolitan cities after controlling for demographic variables (i.e., gender, being an only child, subjective social status), the objective cosmopolitanism of one's hometown and university cities, distance between the destination city and one's hometown and university cities, as well as mobility (i.e., relational and residential mobility). On the one hand, this finding provides evidence for the cosmopolitan settlement hypothesis in a collectivist cultural context, which enriches the evidence for the hypothesis (Sevincer et al., 2015, 2017). On the other hand, our research controlled for other confounding variables that previous research on cosmopolitan settlement had not considered (Sevincer et al., 2015, 2017), providing more reliable evidence for the expectations. This suggests that the cosmopolitan settlement hypothesis may be universal and applicable not only to individualistic cultures but also to collectivistic cultures.

The cosmopolitan settlement hypothesis includes both self-selection and reinforcement mechanisms (Sevincer et al., 2015). Self-selection for settlement means that people with high independent self-construal are more inclined to self-select and voluntarily settle in cosmopolitan cities. Reinforcement refers to involvement in cosmopolitan settlement (e.g., adaptation and acculturation), which reinforces individuals' orientation toward independence. Our findings indicated that Chinese senior undergraduates with high levels of independent orientation prefer to settle in cosmopolitan cities, supporting the self-selection mechanism. According to modernization theory, individualism will increase with the development of the economy and modernization (Greenfield, 2009). Indeed, research has shown that the cultural value of individualism is on the rise in contemporary China (Cai et al., 2019). Future

TABLE 3 Results of hierarchical regression analyses for dependence, mobility, and other covariates predicting preference for cosmopolitan cities (second preferred city).

Variable	*B*	*SE*	β	R^2	*CM*	Δ R^2
Step 1				0.132		0.132
Gender (boy = 1, girl = 0)	−0.09	0.12	−0.04			
Being an only child	0.32	0.12	0.18**			
Urban resident	−0.24	0.11	−0.14*			
Subjective social status	0.06	0.03	0.13*			
CBA of hometown	0.01	0.02	0.19**			
CBA of university	0.01	0.01	0.02			
Distance city-hometown	0.01	0.01	0.04			
Distance city-university	0.01	0.01	0.22**			
Step 2a				0.190	2a-1	0.057
Relational mobility	0.14	0.05	0.17**			
History of residential mobility	−0.03	0.04	−0.05			
State of residential mobility	−0.08	0.05	−0.10			
Intention of residential mobility	0.09	0.04	0.12*			
Step 2b				0.163	2b-1	0.030
Independence	0.22	0.07	0.18**			
Step 3				0.203	3-2a	0.014
					3-2b	0.041
Relational mobility	0.10	0.05	0.12*			
History of residential mobility	−0.03	0.04	−0.04			
State of residential mobility	−0.08	0.05	−0.10			
Intention of residential mobility	0.09	0.04	0.12*			
Independence	0.16	0.07	0.13*			

CBA of hometown = city of hometown, business attractiveness; CBA of university = city of university, business attractiveness; Distance city-hometown = distance between the second preferred city and hometown; Distance city-university = distance between the second preferred city and university.
**$p < 0.01$, *$p < 0.05$.

studies could continue to investigate the self-selection and reinforcement mechanisms of the cosmopolitan settlement hypothesis.

Moreover, the direct effect of relational mobility on preference for cosmopolitan cities above and beyond related control variables was not solid, but the indirect effect of relational mobility on preference for cosmopolitan cities *via* independence was robust, partly supporting Hypothesis 2. The results revealed a mechanism—namely, dependence—that accounts for the within-culture influence of relational mobility on the preference for cosmopolitan cities. Relational mobility refers to one's perception of the mobility of interpersonal and group relations in society. As relational mobility influences the degree to which people rely on others within solid or dynamic relationships, relational mobility may also impact the extent to which others are essential in an individual's self-construal (San Martin et al., 2019). When placed into independent self-construal, individuals in high-mobility environments tend to define themselves as independent of others. The "city air" hypothesis posited that cities offer more freedom, fewer social restrictions, more opportunities, and higher relational mobility (Yamagishi et al., 2012; Yuki and Schug, 2020). Indeed, cosmopolitan cities embrace different ethnic and social groups, place more emphasis on equity and equality, and provide more opportunities to establish new interpersonal relationships and social support networks, symbolizing an independent lifestyle. In turn, independent individuals may be drawn to dwell in cosmopolitan cities due to the matching process between personality and location (Niedenthal et al., 1985). Furthermore, although the indirect effect of residential mobility (i.e., history, state, and intention) on preference for cosmopolitan cities *via* dependence is close to zero and non-significant, the direct effect of intention of residential mobility on preference for cosmopolitan cities was small but robust, partly supporting Hypothesis 3. Previous studies showed that expectancy of future residential mobility rather than a history of residential mobility is linked to subjective wellbeing, insecurity, and materialism in selected Chinese undergraduates (Meng and Xie, 2019; Zhou and Xie, 2019). A recent review based mostly on research undertaken in Western cultures concluded that residential mobility not only makes individuals change their focus from communal to personal traits, but also alters their relationship preferences and values in favor of broader social relationships, more open interaction, and looser commitment groups (Oishi and Tsang, 2022). These contradictory findings imply that the effect of residential mobility may vary across cultures (Meng and Xie, 2019). China is a large agricultural country and one of the world's founders of agricultural practices, with a low mobility rate. Most Chinese people are satisfied to live in their native land and are reluctant to move to another place. They also tend to hold that a person residing elsewhere will ultimately return to their native land. In recent years, however, due to the growth of the social economy, individuals are increasingly relocating to cities for further education and employment, and the mobility rate is rising. Because of past steady living conditions, Chinese people might not only see their lives as consistent, but may also not have a mobility mindset. This might explain why history and state of residential mobility was not linked to independence and preference for cosmopolitan cities. As research on residential mobility among the Chinese population is limited, more studies are warranted to understand the psychological and behavioral outcomes of residential mobility.

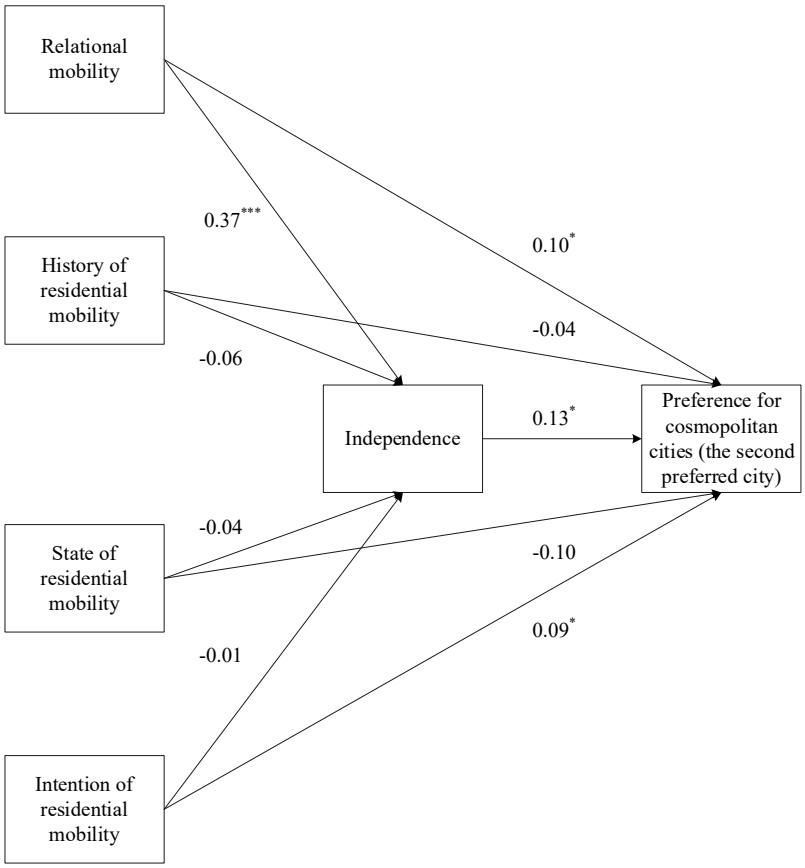

FIGURE 2
The mediating role of independence in the association between mobility and preference for cosmopolitan cities (the second preferred city), with standardized coefficients. Results of covariates are not shown for the purpose of simplicity; ***$p < 0.001$, *$p < 0.05$.

There are also some shortcomings in this study. First, the sample size of senior undergraduates from four universities selected in this study is small. Future research should increase the generalizability of the results by examining more varied and representative groups (e.g., employees). Second, this study measures cosmopolitanism of the preferred or intended city of employment rather than of the city that college graduates eventually choose after graduation. Although the preferred or intended city affects the actual city of employment, the city to which college students ultimately relocate is also influenced by factors such as cost of living, family characteristics, family influence, sustainable development, and employability (Sun et al., 2020; Zeng et al., 2021). Therefore, future researchers are encouraged to examine the applicability of the cosmopolitan settlement hypothesis in collectivist cultures after controlling for these factors. Third, since this research is cross-sectional, causal inferences cannot be drawn from the results. Future research can further explore the self-selection and reinforcement mechanisms of the cosmopolitan settlement hypothesis through experimental methods and longitudinal follow-up studies. Finally, individualism, for the Chinese undergraduates, may be different from that of students in Western cultures. Future studies should use qualitative data to reconceptualize individualism among Chinese young adults, and continue to investigate the connection between the preference for cosmopolitan cities and emerging forms of Chinese individualism.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Research Ethical Committee in Zhaoqing University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

HT: research design and protocol, raw manuscript, and manuscript revisions and corrections. GC: research protocol, data collection and analysis, and raw manuscript. ZL, RZ, and CL: data collection and manuscript revisions and corrections. YS: data analysis, raw manuscript, and manuscript revisions and corrections. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Bai, J. Y., and Ren, X. P. (2021). Chuangguandong movement and the independent agency. *Chin. Soc. Psychol. Rev.* 20, 230–250.

Borschel, E., Zimmermann, J., Crocetti, E., Meeus, W., Noack, P., and Neyer, F. J. (2019). Me and you in a mobile world: The development of regional identity and personal relationships in young adulthood. *Dev. Psychol.* 55, 1072–1087. doi: 10.1037/dev0000677

Cai, H. J., Huang, Z. H., and Jing, Y. M. (2019). "Living in a changing world: The change of culture and psychology," in *Oxford handbook of culture and psychology, 2nd Edn*, eds D. Matsumoto and H. C. Hwang (Oxford: Oxford University Press), 1070–1116.

Chen, S. S., Xu, J., and Ren, X. P. (2016). The voluntary migration hypothesis of the independent self: evidence from China. *Chin. J. Clin. Psychol.* 24, 738–740. doi: 10.16128/j.cnki.1005-3611.2016.04.037

Chen, X. X., Ren, X. P., and Zhang, C. K. (2019). Shenzhen spiritual nurturing independent me behavior style. *Chin. Soc. Psychol. Rev.* 1, 14–37.

Chen, Y., Liu, X., Lan, T., and Hong, Y. (2022). Move more and bribe more? The impact of residential mobility on bribe-giving. *Asian J. Soc. Psychol.* 25, 237–248. doi: 10.1111/ajsp.12492

Choi, H., and Oishi, S. (2020). The psychology of residential mobility: A decade of progress. *Curr. Opin. Psychol.* 32, 72–75. doi: 10.1016/j.copsyc.2019.07.008

Falk, C. F., Heine, S. J., Yuki, M., and Takemura, K. (2009). Why do westerners self-enhance more than East Asians? *Eur. J. Pers.* 23, 183–203. doi: 10.1002/per.715

Feng, J., Ren, X., and Ma, X. (2017). Ongoing voluntary settlement and independent agency: Evidence from China. *Front. Psychol.* 8:1287. doi: 10.3389/fpsyg.2017.01287

Greenfield, P. M. (2009). Linking social change and developmental change: Shifting pathways of human development. *Dev. Psychol.* 45, 401–418. doi: 10.1037/a0014726

Hayes, A. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.

Hu, M. L., Wang, M. C., Cai, L., Zhu, X. Z., and Yao, S. Q. (2012). Development of subjective socioecomomic status scale for Chinese adolescents. *Chin. J. Clin. Psychol.* 20, 155–161.

Ishii, K. (2014). Consequences of voluntary settlement: Normative beliefs related to independence in Hokkaido. *J. Cogn. Cult.* 14, 159–169. doi: 10.1163/15685373-12342118

Jensen, K., Kim, J. M., and Yi, H. (2015). The geography of US auditors: Information quality and monitoring costs by local versus non-local auditors. *Rev. Quant. Financ. Account.* 44, 513–549. doi: 10.1007/s11156-013-0416-2

Kim, H., Schimmack, U., Oishi, S., and Tsutsui, Y. (2018). Extraversion and life satisfaction: A cross-cultural examination of student and nationally representative samples. *J. Pers.* 86, 604–618. doi: 10.1111/jopy.12339

Kitayama, S., Conway Iii, L. G., Pietromonaco, P. R., Park, H., and Plaut, V. C. (2010). Ethos of independence across regions in the United States: The production-adoption model of cultural change. *Am. Psychol.* 65, 559–574. doi: 10.1037/a0020277

Kitayama, S., Ishii, K., Imada, T., Takemura, K., and Ramaswamy, J. (2006). Voluntary settlement and the spirit of independence: Evidence from Japan's "northern frontier". *J. Pers. Soc. Psychol.* 91, 369–384. doi: 10.1037/0022-3514.91.3.369

Kitayama, S., Park, H., Sevincer, A. T., Karasawa, M., and Uskul, A. K. (2009). A cultural task analysis of implicit independence: Comparing North America, Western Europe, and East Asia. *J. Pers. Soc. Psychol.* 97, 236–255. doi: 10.1037/a0015999

Li, L. M. W., Wang, S., and Lin, Y. (2022). The casual effect of relational mobility on integration of social networks: An agent-based modeling approach. *Curr. Psychol.* 1–17. doi: 10.1007/s12144-022-03130-x [Epub ahead of print].

Liu, X. Y., and Yuan, X. (2022). Study on the mechanism of city selection of young migrant talents: Based on the perspective of talent characteristics. *Northwest Popul. J.* 43, 14–24. doi: 10.15884/j.cnki.issn.1007-0672.2022.01.002

Luo, C., and Ren, X. P. (2018). Ongoing voluntary frontier movement and individualism: Evidence from a multicultural task analysis. *Adv. Psychol. Sci.* 26, 1928–1934. doi: 10.3724/SP.J.1042.2018.01928

Markus, H., and Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychol. Rev.* 98, 224–253. doi: 10.1037/0033-295X.98.2.224

Meng, S. Q., and Xie, T. (2019). The history and prospect of residential mobility: How does the prospect of residential mobility affect subjective well-being? *Chin. Soc. Psychol. Rev.* 1, 89–113.

Murray, C. (2012). *Coming apart: The state of white America 1960-2010*. New York, NY: Random House.

Niedenthal, P. M., Cantor, N., and Kihlstrom, J. F. (1985). Prototype matching: A strategy for social decision making. *J. Pers. Soc. Psychol.* 48, 575–584. doi: 10.1037/0022-3514.48.3.575

Oishi, S. (2014). Socioecological psychology. *Annu. Rev. Psychol.* 65, 581–609. doi: 10.1146/annurev-psych-030413-152156

Oishi, S., and Tsang, S. (2022). The socio-ecological psychology of residential mobility. *J. Consum. Psychol.* 32, 519–536. doi: 10.1002/jcpy.1310

Oishi, S., Lun, J., and Sherman, G. D. (2007). Residential mobility, self-concept, and positive affect in social interactions. *J. Pers. Soc. Psychol.* 93, 131–141. doi: 10.1037/0022-3514.93.1.131

Oishi, S., Schug, J., Yuki, M., and Axt, J. (2015). "The psychology of residential and relational mobilities," in *Handbook of advances in culture and psychology*, eds

M. J. Gelfand, C.-Y. Chiu, and Y.-Y. Hong (Oxford: Oxford University Press), 221–272.

Operario, D., Adler, N. E., and Williams, D. R. (2004). Subjective social status: Reliability and predictive utility for global health. *Psychol. Health* 19, 237–246. doi: 10.1080/08870440310001638098

Owens, B. P., and Hekman, D. R. (2016). How does leader humility influence team performance? Exploring the mechanisms of contagion and collective promotion focus. *Acad. Manag. J.* 59, 1088–1111. doi: 10.5465/amj.2013.0660

Preacher, K. J., and Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* 40, 879–891. doi: 10.3758/brm.40.3.879

San Martin, A., Schug, J., and Maddux, W. W. (2019). Relational mobility and cultural differences in analytic and holistic thinking. *J. Pers. Soc. Psychol.* 116, 495–518. doi: 10.1037/pspa0000142

Schug, J., Yuki, M., and Maddux, W. (2010). Relational mobility explains between- and within-culture differences in self-disclosure to close friends. *Psychol. Sci.* 21, 1471–1478. doi: 10.1177/0956797610382786

Sevincer, A. T., Kitayama, S., and Varnum, M. E. W. (2015). Cosmopolitan cities: The frontier in the twenty-first century? *Front. Psychol.* 6:1459. doi: 10.3389/fpsyg.2015.01459

Sevincer, A. T., Kwon, J. Y., Varnum, M. E. W., and Kitayama, S. (2021). Risky business: Cosmopolitan culture and risk-taking. *J. Cross. Cult. Psychol.* 52, 295–315. doi: 10.1177/00220221211003207

Sevincer, A. T., Varnum, M., and Kitayama, S. (2017). The culture of cities: Measuring perceived cosmopolitanism. *J. Cross. Cult. Psychol.* 48, 1–21. doi: 10.1177/0022022117717030

Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Pers. Soc. Psychol. Bull.* 20, 580–591. doi: 10.1177/0146167294205014

Sinnott, R. (1984). Virtues of the haversine. *Sky Telescope* 68:159.

Su, C. J., Xiang, Y. Y., Ren, X. P., and Wei, Q. W. (2019). Adaption promotes individualism of cosmopolitan city settlers. *Chin. J. Clin. Psychol.* 27, 1251–1255. doi: 10.16128/j.cnki.1005-3611.2019.06.035

Sun, H., Pofoura, A. K., Adjei Mensah, I., Li, L., and Mohsin, M. (2020). The role of environmental entrepreneurship for sustainable development: Evidence from 35 countries in Sub-Saharan Africa. *Sci. Total. Environ.* 741:140132. doi: 10.1016/j.scitotenv.2020.140132

The Rising Lab (2019). Ranking of cities' business attractiveness 2021 in China. *YiMagazine* 540, 88–100. doi: 10.3389/fpsyg.2021.817805

Thomson, R., Yuki, M., Talhelm, T., Schug, J., Kito, M., Ayanian, A. H., et al. (2018). Relational mobility predicts social behaviors in 39 countries and is tied to historical farming and threat. *Proc. Natl. Acad. Sci. U.S.A.* 115, 7521–7526. doi: 10.1073/pnas.1713191115

Vandello, J. A., and Cohen, D. (1999). Patterns of individualism and collectivism across the United States. *J. Pers. Soc. Psychol.* 77, 279–292. doi: 10.1037/0022-3514.77.2.279

Varnum, M. E. W. (2012). Conformity effect sizes are smaller on the frontier. *J. Cogn. Cult.* 12, 359–364. doi: 10.1163/15685373-12342080

Wang, Y., Kirmani, A., and Li, X. (2021). Not too far to help: Residential mobility, global identity, and donations to distant beneficiaries. *J. Consum. Psychol.* 47, 878–889. doi: 10.1093/jcr/ucaa053

Wen, G. H., Chen, H., and Yu, T. (2020). Research on the characteristics and influencing mechanism of college students, employment city selection based on the theory of planned behavior: Taking Nanjing as an example. *Modern Urban Res.* 6, 64–71. doi: 10.3969/j.issn.1009-6000.2020.06.009

Xie, Y. Y., Li, J. H., and Ma, L. (2022). Determinants of employment city selection of young intellectual migrants: A case study of Guangzhou university graduates. *Trop Geo* 42, 385–395. doi: 10.13284/j.cnki.rddl.003458

Xinhuanet (2021). *China's population continues to grow in 2021*. Beijing: Xinhua News Agency.

Yamagishi, T., Hashimoto, H., Li, Y., and Schug, J. (2012). Stadtluft macht frei (City air brings freedom). *J. Cross Cult. Psychol.* 43, 38–45. doi: 10.1177/0022022111415407

Yicai Global, (2021). *Yicai big data project ranks China's cities for business attractiveness*. Available online at: https://www.yicaiglobal.com/news/yicai-big-data-project-ranks-china-cities-for-business-attractiveness (accessed August 8, 2022).

Yuan, D. L., and Zhou, J. (2021). Influence of geographical distance on effectiveness of independent directors' performance: Based on dual perspectives of supervisory and advisory functions. *Res. Econ. Manag.* 42, 122–144. doi: 10.13502/j.cnki.issn1000-7636.2021.02.010

Yuki, M., and Schug, J. (2012). "Relational mobility: A socioecological approach to personal relationships," in *Relationship Science: Integrating evolutionary, neuroscience, and sociocultural approaches*, eds O. Gillath, G. Adams, and A. Kunkel (Washington, DC: American Psychological Association), 137–151.

Yuki, M., and Schug, J. (2020). Psychological consequences of relational mobility. *Curr. Opin. Psychol.* 32, 129–132. doi: 10.1016/j.copsyc.2019.07.029

Yuki, M., Schug, J., Horikawa, H., Takemura, K., Sato, K., Yokota, K., et al. (2007). *Development of a scale to measure perceptions of relational mobility in society*. Available online at: https://www.academia.edu/3872326/Development_of_a_scale_to_measure_perceptions_of_relational_mobility_in_society (accessed August 8, 2022).

Zeng, G., Hu, Y., Wu, W., and Isaac, K. M. (2021). Employment flow of college graduates in China: City preference and group difference. *SAGE Open* 11, 1–11. doi: 10.1177/2158244021998696

Zhou, J., and Xie, T. (2019). The expectancy of future residential mobility could predict one's materialism: The mediating role of insecurity and the moderating role of psychological needs. *Chin. Soc. Psychol. Rev.* 16, 114–136.

Zuo, S., Cai, P., Huang, N., Wang, F., and Wang, P. (2022). Population migration damages the natural environment: A multilevel investigation of the relationship between residential mobility and pro-environmental behaviors. *Pers. Soc. Psychol. Bull.* doi: 10.1177/01461672221079451 [Epub ahead of print].

Zuo, S., Huang, N., Cai, P., and Wang, F. (2018). The lure of antagonistic social strategy in unstable socioecological environment: Residential mobility facilitates individuals' antisocial behavior. *Evol. Hum. Behav.* 39, 364–371. doi: 10.1016/j.evolhumbehav.2018.03.002

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Accelerating the science and practice of psychology beyond WEIRD biases: Enriching the landscape through Asian psychology

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More than a decade has passed since major concerns emerged about the WEIRD-centric focus of mainstream psychological science. Since then, many calls have been made for the discipline of psychology (and other disciplines within the social sciences) to become more broadly representative of the human species. However, recent evidence suggests that progress toward improving the inclusivity and generalizability of psychological science has been slow, and that the dominance of WEIRD psychology has persisted. To build a more comprehensive psychological science that truly represents the global population, we need strategies that can facilitate more rapid expansion of empirical evidence in psychology beyond WEIRD biases. In this paper, we draw on several examples (i.e., non-duality and dialectical interaction, Wu-Wei, Zhong Yong) to illustrate how principles of Asian psychology could contribute to reshaping mainstream psychology. We discuss some strategies for advancing a global psychological science, along with some complementary practical suggestions that could enrich the WEIRD-centric landscape of current psychological science.

KEYWORDS

Asian psychology, global psychology, indigenous psychology, multiculturalism, WEIRD psychology, psychological science

Introduction

More than a decade ago, Arnett (2008) published a seminal paper suggesting that up to 95% of participants included in publications within premier American Psychological Association (APA) journals during the last 20 years were from populations that represented approximately 12% of the global population (68% of samples were from the United States). This finding ignited concerns that psychological science (and social science more generally) might be disproportionately skewed toward and narrowly representative of people from societies that are Western, Educated, Industrialized, Rich, and Democratic (WEIRD), and

ushered in calls to build a more inclusive body of social scientific research that is representative of all humanity (Henrich et al., 2010).

Almost 15 years later, Thalmayer et al. (2021) evaluated progress toward greater diversification of psychological science beyond WEIRD contexts by repeating Arnett's (2008) analysis for the years 2014–2018. They found that up to 93% of participants in the publications during the study period were from WEIRD societies (62% of samples were from the United States). Although Thalmayer et al.'s (2021) analysis focused on top-tier psychology journals published by the APA (and therefore may not be entirely representative of the broader psychological literature), other similar reviews in psychology have reported comparable findings (e.g., Hendriks et al., 2019). Hence, it appears that the WEIRD-centric emphasis of psychological science has largely persisted.

Tremendous contributions have been made by WEIRD-centric psychology toward understanding and promoting human flourishing. However, the WEIRD-centricity that characterizes mainstream psychology presents an opportunity to develop strategies aimed at building a more inclusive and representative psychological science (Lomas, 2018). Without such transformation, meta-analytic evidence, theory development, and policymaking decisions are more likely to be informed by WEIRD psychosocial functioning and biased toward people living in WEIRD societies. In this paper, we draw on several examples to illustrate how principles of Asian psychology might contribute to enriching mainstream psychology. Against this backdrop, we offer some strategies for advancing and accelerating change toward a more culturally responsive and inclusive global psychology (Hwang, 2015, 2019), and provide some complementary practical suggestions that might help reshape the WEIRD-centric landscape of current psychological science.

Non-duality and dialectical interaction

An important contribution of Asian psychology is the principle of non-duality, which emphasizes a continuous process of dialectical interaction between opposites that form a unified whole. The principle of non-duality implies that any attempt to conceptualize or measure a psychological phenomenon ought to recognize the reality of human existence as involving dialectical interplays between opposing dimensions. One example of this is the bifocal approach to locus of control, which does not consider internal and external locus of control as opposite poles on a single dimension, but rather as two independent and interactive dimensions. Only this conception can explain why Chinese students might score high on measures of both internal (e.g., attributing success to ability and effort) and external (e.g., attributing success to parental support, good teachers, and good luck) locus of control (Wong and Sproule, 1984). Findings along similar lines have emerged in other studies, such as school-aged children who report both high mathematics anxiety and mathematics motivation (Wang et al., 2018) or young adult athletes who endorse both approach and avoidance achievement goals (Cowden et al., 2021a).

Non-duality looks at everything in terms of wholeness based on Yin-Yang integration of independent but interactive opposing dimensions (see Figure 1). A key advantage of this approach is that it enables participants to express their mental or emotional states anywhere in a two-dimensional space. This non-duality perspective can also encourage individuals to hold two opposing ideas, emotions, or values in both hands and find a way to live with this constant tension. Not only can this Asian worldview change how we typically study the mind and human behavior, but it has clinical utility in helping people become aware of Yin-Yang dialectics and figure out more adaptive ways to embrace and transcend opposite forces (Wong, 2016).

The book of *I-Ching* is the origin of various classic texts in ancient China. Yin-Yang is the root metaphor in the cultural system of I-Ching (Hwang, 2001), and it may be used to denote many opposite but interconnected forces in the universe (e.g., feminine-masculine, moon-sun, day-night; see Figure 1). However, Yin and Yang are not two mutually exclusive concepts. Rather, each contains a component of the other. The principle of Yin-Yang dialectical interactions has been translated into the dual-systems model (Wong, 2011, 2012). According to this model, the approach and avoidance systems co-exist and operate in an interdependent and complementary manner (see Figure 2 for a succinct illustration). This is somewhat analogous to the complementariness of the autonomic nervous system divisions (i.e., sympathetic vs. parasympathetic nervous system) or opponent processes involved in regulating attention (i.e., default vs. task-focused mode). The approach system represents appetitive behaviors, such as goal strivings, goal attainment, and positive emotions. The avoidance system represents defensive mechanisms against noxious stimuli, threats, dangers, and negative emotions. Depending on the context, balanced interaction between the two

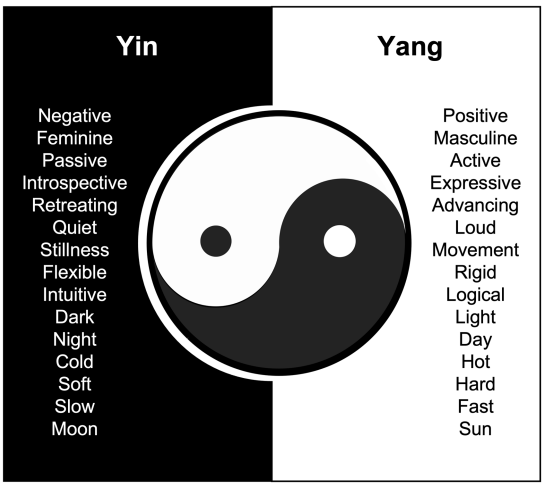

FIGURE 1
Yin-Yang symbol and dialectics.

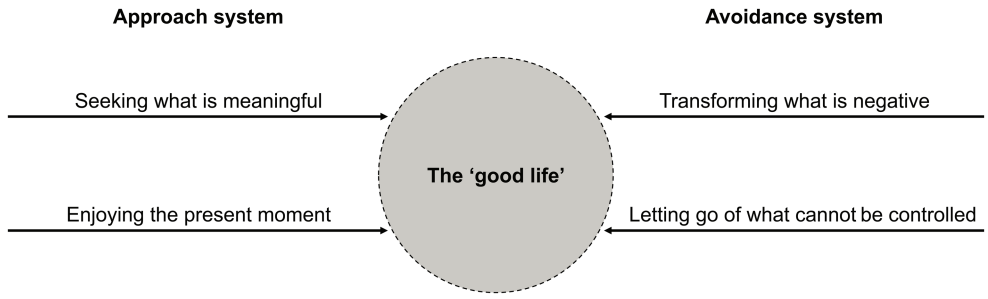

FIGURE 2
Visual illustration summarizing the dual-systems model reflecting the 'good life.'

systems is thought to result in more adaptive success and vitality than focusing exclusively on either approach or avoidance. When a person is not actively engaged in approach or avoidance, the default or neutral stage is modulated by the awareness regulation system, which is best maintained by mindful awareness.

The integration of Yin-Yang dialectics to the interplay between approach and avoidance systems can enrich both academic and professional branches of psychology. For example, much of existing research in positive psychology tends to emphasize actions aimed at enhancing wellbeing, but the dual-systems perspective suggests that actions focused on transforming or transcending suffering are equally important for cultivating more durable wellbeing (Ho et al., 2022; Wong et al., 2022). Similarly, psychotherapy might be especially effective when client change centers not only on short-term symptom reduction, but also on assisting clients to discover and pursue a preferred meaningful future (Wong, 2010, 2016; Cowden et al., 2021b, 2022). Hence, the dialectics of the approach and avoidance systems could contribute in important ways to improving our understanding of the human condition, identifying potential pathways to promote human wellbeing, and informing clinical practice.

The power of Wu-Wei

The concept of Wu-Wei has roots in Daoist culture, and can be roughly translated into 'non-doing' or 'actionless action' (Taylor, 1978). According to Daoism, the most important idea is that Dao ('the Way') imitates or follows the way of Nature. Therefore, Wu-Wei can be characterized as "acting effortlessly and spontaneously in perfect harmony with a normative standard" (Slingerland, 2000, p. 296). We are often faced with complicated situations in which the moral boundaries are blurred, or we get stuck on the horn of a dilemma without a clear sense of what to do. Rather than trying to force or act out of desire for a particular outcome, the most adaptive approach might be to pause or take a rest period—adopting Wu-Wei—before deciding how to respond (Wong, 2012). In this way, Wu-Wei involves mindfully observing the situation, considering all available options, and waiting patiently to make the right move.

A growing number of studies have documented evidence demonstrating the power of Wu-Wei in different situations. Xing and Sims (2012) found that senior Chinese bankers had a reflexive awareness of Wu-Wei that shaped the way they went about their work and interacted with other colleagues, including exercising flow (e.g., focusing on the work rather than the result) and self-protection (e.g., stopping at the right moment). Similarly, Roberts and Ertubey (2021) recently demonstrated the relevance of Wu-Wei to Western contexts. Their qualitative study of United Kingdom runners revealed several themes that reflected the role of Wu-Wei in supporting wellbeing, including approaching suffering with acceptance, gratitude, and an opportunity to grow, remaining fully focused on the present, and approaching life from a broader perspective. These findings suggest that practicing Wu-Wei can help people avoid unnecessary struggles and transcend negative experiences in ways that cultivate more enduring wellbeing. The non-duality of Wu-Wei can also have important broader implications for understanding and fostering deeper forms of happiness (e.g., mature happiness) that are less widely acknowledged or promoted in mainstream psychology.

The doctrine of Zhong Yong

The doctrine of Zhong Yong is a central part of the cultural system of Confucianism (Li, 2008). A summary and second order interpretation of all Confucius' teachings can be found in Chapter 20 of *Zhong Yong*, one of four classic books of Confucianism. The word Zhong literally means 'center' or 'middle,' and practically involves acting in a non-biased way. Yong refers to 'usefulness' or 'constant.' Together, Zhong Yong can be translated into 'the mean as a constructive principle' or 'consistently practicing the middle-road in daily life' (Suh, 2020; Gao et al., 2022). The Confucian doctrine of Zhong Yong shares some parallels with Aristotle's doctrine of the Mean (e.g., both advocate that one can have too much or too little of something), but the former refers to the mentality of how to live a life of harmony whereas the latter is oriented principally toward transcendent virtue (Xia, 2020).

Following the path of Zhong Yong does not entail mechanically or quantitatively finding an equal distance between opposites, but instead is a qualitative state of equilibrium and harmony with oneself, the world around us, and the transcendental realm. For this reason, the doctrine of Zhong Yong is somewhat different from the optimality principle, which is essentially concerned with quantitatively maximizing benefits (Suh, 2020). The golden Mean emphasized by the doctrine of Zhong Yong is a harmonious state of balance between internal and external factors. It is also the fundamental criterion for achieving balanced harmony (Li and Cui, 2022), which is based on the ultimate balance of internal harmony (i.e., a harmonious state within one's mind and body) and external harmony (i.e., harmonious relationships with others, with society, and with nature). On this view, the ideal life is to live in peace within oneself and in harmony with family members, neighbors, and nature.

When adversity and hardship arise, it is both unrealistic and difficult to maintain a positive emotional state because being in a happy mood while also experiencing anxiety about resolving a very stressful situation is physiologically infeasible. In such circumstances, the best we can hope for is to remain calm and maintain a delicate balance between anxiety and positive emotions, which means inner peace. This can be achieved by nurturing inner harmony with oneself and with others, gratitude, and contentment. Therefore, according to Asian psychology, optimal balanced harmony between self and others and between opposites in each situation can lead to mature happiness that is based on inner peace, harmony, and contentment (Wong and Bowers, 2019; Carreno et al., 2021).

The implication of Zhong Yong is that wellbeing for both the East and the West depends on achieving balanced harmony between internal and external harmony. In recognition of this, recent literature points to balance and harmony as the 'golden thread' that runs through all aspects of life (Lomas, 2021). Perhaps more importantly, large-scale global research through the Global Wellbeing Initiative (a partnership between Gallup and the Wellbeing for Planet Earth Foundation) is underway to explore experiences of balance and harmony around the world. This collaboration could play an important role in reshaping the WEIRD-centric database of existing research on wellbeing and catalyzing a more well-rounded understanding of human wellbeing, although further work will be needed to enrich the evidence that emerges from this effort with research that provides greater depth on balance, harmony, and other concepts that are particularly prominent in non-Western theologies and philosophies.

Some strategies to enrich mainstream psychology

Everything that people do is shaped and colored by culture. Therefore, we can only develop a comprehensive understanding of human nature by studying more diverse participants and cultural contexts. To support further change toward an inclusive and representative global psychology, we propose some strategies (in no particular order) that may be useful to researchers who are interested in further transforming the WEIRD-centricity of mainstream psychology.

First, researchers are encouraged to adopt and refine integrative theories and conceptual models that attempt to address the complexities of the human condition and can support the needs of humanity. One possible prototype for a more global psychology is the multicultural existential positive psychology paradigm. On the surface, existential positive psychology is a synthesis of positive psychology and existentialism. At a deeper level, existential positive psychology is an integration of ancient Chinese positive psychology rooted in Taoism, Confucianism, and Buddhism, existential universals of ultimate concerns and transcendental values, and Western clinical and positive psychology. At its core, existential positive psychology is concerned with how to find harmony, contentment, and tranquility in the midst of constant change, chaos, and suffering by becoming attuned with oneself, humanity, and God or Tao (Chen, 2006; Hwang, 2012; Wong et al., 2021b). Accumulating literature suggests that existential positive psychology has heuristic value in advancing the science and practice of psychology (e.g., Wong, 2019; Arslan and Wong, 2021; Van Tongeren and Showalter Van Tongeren, 2021), and it has potential to make a substantive contribution to the next frontier of theory, research, and practice aimed at supporting the psychological needs of humanity.

Second, psychology ought to further develop, employ, and fine-tune multidimensional measures that address the non-dualistic and dialectical dynamics of human experience. For example, several measures have drawn on Yin-Yang dialectical interactions between positive and negative to assess phenomena of interest in a two-dimensional space (e.g., Death Attitude Profile-Revised; Wong et al., 1994) or the co-existence of conflicting emotions and experiences (Life Attitudes Scale-Brief; Leung et al., 2021). In principle, such measures are an attempt to align quantitative assessment of psychological phenomena more closely with the complex nature of human psychological experience. To the extent that assessment is successful at achieving this, it is possible that psychological science might evolve more rapidly.

Third, reforming the WEIRD-centricity of mainstream psychology will require more culturally responsive research that strikes a balance between upholding rigorous standards for causal inference and acquiring rich insights that support a more granulated interpretation of psychological phenomena within a particular culture and context. This could be accomplished (in part) through carefully orchestrated mixed methods research that draws on the best of robust, systematized quantitative approaches and creative, flexible qualitative techniques. For example, well-designed

longitudinal studies are necessary for estimating causal effects with observational data, whereas qualitative approaches provide valuable opportunities to acquire a deeper understanding of the psychological processes and contextual factors that shape outcomes. Consistently applying this combination of research methodologies together may be indispensable for capturing the breadth and depth needed to fully address complex themes that are gaining popularity, such as the notion of transcending suffering as a foundation for flourishing (Wong et al., 2022; Wong and Tweed, 2022).

Fourth, further efforts must be dedicated toward developing, testing, and refining culturally responsive interventions and treatments informed by integrative models that synthesize disparate theoretical orientations (Wong, 2010; Cowden et al., 2023). Although psychotherapeutic treatments along these lines are essential, it will also be important to formulate culturally sensitive and contextually appropriate evidence-based interventions that have the potential for widespread dissemination at nominal cost (e.g., self-guided psychoeducational approaches; Wong et al., 2022). Successful prototypes from Western psychology (e.g., do-it-yourself REACH Forgiveness workbooks; Worthington, 2020) could provide useful templates for designing such scalable interventions. Although these kinds of interventions would not be an alternative to psychotherapy, they could be complementary to clinical treatment and also serve as valuable resources for non-treatment-seeking individuals who might benefit from additional supports.

The abovementioned strategies will need to be supported by changes in how research in psychology is typically conducted, funded, and evaluated. A truly global psychology needs programmatic lines of local, regional, and international research involving both WEIRD and non-WEIRD scholars and practitioners. Local scholars in non-WEIRD contexts might consider forming collaborative partnerships with well-established international researchers who could provide expertise in developing and implementing systematic programs of research (Cowden et al., 2023). International projects must include local researchers who reside in and have knowledge of the contexts under study, and it would be highly preferable to have psychologists from non-WEIRD countries leading the research teams for such projects (Wong et al., 2021a).

Arnett (2008) proposed several policies to improve the internationalization of psychological science, some of which aimed to alter traditional journal practices (e.g., encouraging prominent APA journals to include non-Western scholars as associate and consulting editors) and funding priorities (e.g., calling for funding agencies to create programs that fund international research). Although some progress has been made toward adopting the policies that were outlined, changes have mostly been incremental and quite limited. For example, Thalmayer et al. (2021) reported that inclusion of international scholars on editorial boards of APA journals remained relatively unchanged after approximately 10 years since Arnett's (2008) policy proposals were made. We are optimistic about the changes that could occur if commitments were made to prioritize guidelines and propositions put forward by Arnett (2008) and others (e.g., Nielsen et al., 2017; Hendriks et al., 2019; Cheon et al., 2020), but comprehensive and sustained transformation seems unlikely unless all stakeholders with an interest in the discipline of psychology (e.g., researchers, practitioners, journal editors, journal reviewers, funding agencies) have a role in that process. For example, including non-Western associate and consulting editors on the editorial boards of high-impact journals might only have a partial impact on reducing bias toward concepts and findings from WEIRD researchers if journals do not also take steps to recruit and maintain a database of non-Western reviewers who can support a more balanced peer-review process. Similarly, funding agencies should consider instituting policies and practices that could meaningfully contribute to a less WEIRD database of evidence and promote longer-term changes in research that help to address concerns about the generalizability of psychological science, such as requiring a proportion of funded research projects to meet criteria that align with transforming the current WEIRDness of mainstream psychology. Therefore, a multilayered, systems-level approach might be needed to accomplish the scale of transformation that will lead to a global psychology.

Conclusion

In recent years, there has been a clear shift away from a WEIRD-centric psychology to a more inclusive global psychology on several fronts, including an epistemological revolution to replace positivism with culture-inclusive psychological theories (Hwang, 2019) and a movement toward balancing self or ego-based Western psychotherapies with the self-enlightenment cultivation process that is based on Confucian, Buddhist, and Taoist teachings (Shiah, 2020). Complementing these efforts, this paper drew on principles from Asian psychology to highlight the potential for mainstream psychology to be reshaped into a scientific discipline that generates evidence which can be generalized more broadly beyond WEIRD societies. Although we have re-signaled the importance of ramping up efforts to develop a more inclusive global psychology, achieving such change will likely require collective commitment from psychologists in all parts of the world.

Author contributions

PW and RC contributed equally to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Arnett, J. J. (2008). The neglected 95%: why American psychology needs to become less American. *Am. Psychol.* 63, 602–614. doi: 10.1037/0003-066X.63.7.602

Arslan, G., and Wong, P. T. P. (2021). Measuring personal and social responsibility: an existential positive psychology approach. *J. Happiness Health* 2, 1–11. doi: 10.47602/johah.v2i1.5

Carreno, D. F., Eisenbeck, N., Pérez-Escobar, J. A., and García-Montes, J. M. (2021). Inner harmony as an essential facet of well-being: a multinational study during the COVID-19 pandemic. *Front. Psychol.* 12:648280. doi: 10.3389/fpsyg.2021.648280

Chen, Y. H. (2006). "Coping with suffering: the Buddhist perspective" in *Handbook of multicultural perspectives on stress and coping*. eds. P. T. P. Wong and L. C. J. Wong (New York, NY: Springer), 73–89

Cheon, B. K., Melani, I., and Hong, Y.-Y. (2020). How USA-centric is psychology? an archival study of implicit assumptions of generalizability of findings to human nature based on origins of study samples. *Soc. Psychol. Personal. Sci.* 11, 928–937. doi: 10.1177/1948550620927269

Cowden, R. G., Counted, V., and Ho, M. Y. (2023). "Positive psychology and religion/spirituality across cultures in Africa, Asia, and Oceania" in *Handbook of positive psychology, religion, and spirituality*. eds. E. B. Davis, E. L.Worthington Jr. and S. A. Schnitker (Cham, Switzerland: Springer), 243–259.

Cowden, R. G., Davis, E. B., Counted, V., Chen, Y., Rueger, S. Y., VanderWeele, T. J., et al. (2021b). Suffering, mental health, and psychological well-being during the COVID-19 pandemic: a longitudinal study of U.S. adults with chronic health conditions. *Wellbeing Space Soc.* 2:100048. doi: 10.1016/j.wss.2021.100048

Cowden, R. G., Mascret, N., and Duckett, T. R. (2021a). A person-centered approach to achievement goal orientations in competitive tennis players: associations with motivation and mental toughness. *J. Sport Health Sci.* 10, 73–81. doi: 10.1016/j.jshs.2018.10.001

Cowden, R. G., Węziak-Białowolska, D., McNeely, E., and VanderWeele, T. J. (2022). Are depression and suffering distinct? an empirical analysis. *Front. Psychol.* 13:970466. doi: 10.3389/fpsyg.2022.970466

Gao, R., Huang, S., Yao, Y., Liu, X., Zhou, Y., Zhang, S., et al. (2022). Understanding Zhongyong using a Zhongyong approach: re-examining the non-linear relationship between creativity and the Confucian doctrine of the mean. *Front. Psychol.* 13:903411. doi: 10.3389/fpsyg.2022.903411

Hendriks, T., Warren, M. A., Schotanus-Dijkstra, M., Hassankhan, A., Graafsma, T., Bohlmeijer, E., et al. (2019). How WEIRD are positive psychology interventions? a bibliometric analysis of randomized controlled trials on the science of well-being. *J. Posit. Psychol.* 14, 489–501. doi: 10.1080/17439760.2018.1484941

Henrich, J., Heine, S., and Norenzayan, A. (2010). Most people are not WEIRD. *Nature* 466:29. doi: 10.1038/466029a

Ho, S., Cook, K. V., Chen, Z. J., Kurniati, N. M. T., Suwartono, C., Widyarini, N., et al. (2022). Suffering, psychological distress, and well-being in Indonesia: a prospective cohort study. *Stress Health*. doi: 10.1002/smi.3139 [Epub ahead of print].

Hwang, K.-K. (2001). The deep structure of Confucianism: a social psychological approach. *Asian Philo.* 11, 179–204. doi: 10.1080/09552360120116928

Hwang, K.-K. (2012). *Foundations of Chinese psychology: Confucian social relations*. New York, NY: Springer.

Hwang, K.-K. (2015). Culture-inclusive theories of self and social interaction: the approach of multiple philosophical paradigms. *J. Theory Soc. Behav.* 45, 40–63. doi: 10.1111/jtsb.12050

Hwang, K.-K. (2019). *Culture-inclusive theories: An epistemological strategy*. Cambridge, UK: Cambridge University Press.

Leung, M. M., Arslan, G., and Wong, P. T. P. (2021). Tragic optimism as a buffer against COVID-19 suffering and the psychometric properties of a brief version of the Life Attitudes Scale. *Front. Psychol.* 12:646843. doi: 10.3389/fpsyg.2021.646843

Li, C. (2008). The philosophy of harmony in classical Confucianism. *Philos Compass* 3, 423–435. doi: 10.1111/j.1747-9991.2008.00141.x

Li, Y., and Cui, H. (2022). On the value of the Chinese pre-Qin Confucian thought of "harmony" for modern public mental health. *Front. Psychol.* 13:870828. doi: 10.3389/fpsyg.2022.870828

Lomas, T. (2018). Experiential cartography and the significance of "untranslatable" words. *Theory Psychol.* 28, 476–495. doi: 10.1177/0959354318772914

Lomas, T. (2021). Life balance and harmony: wellbeing's golden thread. *Int. J. Wellbeing* 11, 50–68. doi: 10.5502/ijw.v11i1.1477

Nielsen, M., Haun, D., Kärtner, J., and Legare, C. H. (2017). The persistent sampling bias in developmental psychology: a call to action. *J. Exp. Child Psychol.* 162, 31–38. doi: 10.1016/j.jecp.2017.04.017

Roberts, W., and Ertubey, C. (2021). Flow the wu-wei way: a thematic analysis of charity runners' experience of wu-wei in enhancing wellbeing and flourishing. *Int. J. Wellbeing* 12, 132–154. doi: 10.5502/ijw.v12i4.2129

Shiah, Y.-J. (Ed.) (2020). *Foundations of Chinese psychotherapies: Towards self-enlightenment*. Cham, Switzerland: Springer.

Slingerland, E. (2000). Effortless action: the Chinese spiritual ideal of wu-wei. *J. Am. Acad. Relig.* 68, 293–328. doi: 10.1093/jaarel/68.2.293

Suh, J. (2020). The Confucian doctrine of the mean, the optimality principle, and social harmony. *Soc. Econ.* 42, 59–73. doi: 10.1556/204.2020.00004

Taylor, E. (1978). "Asian interpretations: transcending the stream of consciousness" in *The stream of consciousness: Scientific investigations into the flow of human experience*. eds. K. S. Pope and J. L. Singer (New York, NY: Springer), 31–54.

Thalmayer, A. G., Toscanelli, C., and Arnett, J. J. (2021). The neglected 95% revisited: is American psychology becoming less American? *Am. Psychol.* 76, 116–129. doi: 10.1037/amp0000622

Van Tongeren, D. R., and Showalter Van Tongeren, S. A. (2021). Finding meaning amidst COVID-19: an existential positive psychology model of suffering. *Front. Psychol.* 12:641747. doi: 10.3389/fpsyg.2021.641747

Wang, Z., Shakeshaft, N., Schofield, K., and Malanchini, M. (2018). Anxiety is not enough to drive me away: a latent profile analysis on math anxiety and math motivation. *PLoS ONE* 13:e0192072. doi: 10.1371/journal.pone.0192072

Wong, P. T. P. (2010). Meaning therapy: an integrative and positive existential psychotherapy. *J. Contemp. Psychother.* 40, 85–93. doi: 10.1007/s10879-009-9132-6

Wong, P. T. P. (2011). Positive psychology 2.0: towards a balanced interactive model of the good life. *Can. Psychol.* 52, 69–81. doi: 10.1037/a0022511

Wong, P. T. P. (2012). "Toward a dual-systems model of what makes life worth living" in *The human quest for meaning: Theories, research, and applications*. ed. P. T. P. Wong. *2nd* ed (New York, NY: Routledge), 3–22.

Wong, P. T. P. (2016). Self-transcendence: a paradoxical way to become your best. *Int. J. Existential Positive Psychol.* 6.

Wong, P. T. P. (2019). Second wave positive psychology's (PP 2.0) contribution to counselling psychology. *Couns. Psychol. Q.* 32, 275–284. doi: 10.1080/09515070.2019.1671320

Wong, P. T. P., Arslan, G., Bowers, V. L., Peacock, E. J., Kjell, O. N. E., Ivtzan, I., et al. (2021a). Self-transcendence as a buffer against COVID-19 suffering: the

development and validation of the Self-Transcendence Measure-B. *Front. Psychol.* 12:648549. doi: 10.3389/fpsyg.2021.648549

Wong, P. T. P., and Bowers, V. (2019). "Mature happiness and global wellbeing in difficult times" in *Scientific concepts behind happiness, kindness, and empathy in contemporary society*. ed. N. R. Silton (Hershey, PA: IGI Global), 112–134.

Wong, P. T. P., Cowden, R. G., Mayer, C.-H., and Bowers, V. L. (2022). "Shifting the paradigm of positive psychology: toward an existential positive psychology of wellbeing" in *Broadening the scope of wellbeing science: Multidisciplinary and interdisciplinary perspectives on human flourishing and wellbeing*. eds. A. H. Kemp and D. J. Edwards (Cham, Switzerland: Palgrave Macmillan), 13–27.

Wong, P. T. P., Mayer, C.-H., and Arslan, G. (2021b). Editorial: COVID-19 and existential positive psychology (PP 2.0): the new science of self-transcendence. *Front. Psychol.* 12:800308. doi: 10.3389/fpsyg.2021.800308

Wong, P. T. P., Reker, G. T., and Gesser, G. (1994). "Death attitude profile–revised: a multidimensional measure of attitudes toward death" in *Death anxiety handbook: Research instrumentation and application*. ed. R. A. Neimeyer (Cham, Switzerland: Taylor and Francis), 121–148.

Wong, P. T. P., and Sproule, C. F. (1984). "Attributional analysis of locus of control and the Trent Attribution Profile (TAP)" in *Research with the locus of control construct, Vol. 3: Limitations and extensions*. ed. H. M. Lefcourt (Washington, DC: Academic Press), 309–360.

Wong, P. T. P., and Tweed, R. (2022). "Region of upper North America (United States and Canada)" in *The international handbook of positive psychology: A global perspective on the science of positive human existence*. eds. E. C. Chang, C. Downey, H. Yang, I. Zettler and M. Muyan-Yılık (Cham, Switzerland: Springer), 17–47.

Worthington, E. L. Jr. (2020). "An update of the REACH Forgiveness model: psychoeducation in groups, do-it-yourself formats, couple enrichment, religious congregations, and as an adjunct to psychotherapy" in *Handbook of forgiveness. 2nd* edn. E. L. Worthington Jr. and N. G. Wade (New York, NY: Routledge), 277–287.

Xia, F. A. (2020). Comparative study of Aristotle's doctrine of the Mean and Confucius' doctrine of Zhong Yong. *Int. Commun. Chin. Cult.* 7, 349–377. doi: 10.1007/s40636-020-00194-x

Xing, Y., and Sims, D. (2012). Leadership, Daoist Wu Wei and reflexivity: flow, self-protection and excuse in Chinese bank managers' leadership practice. *Manag. Learn.* 43, 97–112. doi: 10.1177/1350507611409659

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To approach or to avoid: The quadripolar model of achievement motivation revisited in a Confucian-heritage context

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Academic challenges and failure are inevitable in pursuit of higher education. According to the self-worth theory, trying hard but failing implies low ability that would be a threat to personal worth, thus preventing students from approaching academic challenges. Nevertheless, previous studies have shown that students in the Confucian-heritage contexts (CHCs) tend to persist rather than quit in the face of academic failure. According to the role obligation theory of self-cultivation (ROT), the CHC learners would perceive academic failure from personal and interpersonal perspectives. The former refers to personal obligations to exert oneself toward the ultimate good, and the latter refers to fulfilling filial obligations to parents by achieving academic excellence. Given the fundamental differences in learners' perceptions of academic failure between the CHCs and the Western, Educated, Industrialized, Rich, and Democratic (WEIRD) contexts, this study examined the applicability of the quadripolar model of achievement motivation based on the self-worth theory in a CHC higher education institution. Results of confirmatory factor analysis (CFA) supported a two-factor model of fear of failure, including a personal and an interpersonal subfactor. Latent class analysis (LCA) showed that apart from the four existing categories of the quadripolar model, two additional CHC categories emerged and constituted half of the sample. The two CHC categories demonstrated different learner characteristics compared with their corresponding quadripolar categories in terms of levels of emotional distress and academic risk-taking tendency. The results may help debunk the myth that learner characteristics in the CHCs are identical to those observed in the WEIRD contexts. The fundamental differences in fear of failure further indicated the inadequacy of the self-worth theory in explaining achievement motivation in the CHCs where relationalism and role obligations are significant parts of the cultural traditions.

KEYWORDS

fear of failure, hope of success, academic risk-taking, emotional distress, indebtedness

1. Introduction

Entering higher education is a milestone in the transition to adulthood. However, it also means that students will be confronted with greater academic challenges involving a higher degree of risk taking wherein failure and success might occur one after another. Although failure is inevitable in challenging academic environments, according to the self-worth theory of achievement motivation (hereafter the self-worth theory; Beery, 1975; Covington and Omelich, 1979; Covington, 1984, 1992), academic failures would be a threat to personal worth. Trying hard but failing implies low ability that would trigger humiliation and shame of students who regard incompetence as a fixed trait (Covington, 1984). This fixed mindset of ability would render students vulnerable to emotional distress and helplessness and would lead them to an avoidance tendency toward future academic challenges (Clifford, 1991; Covington, 1992; Martin and Marsh, 2003; De Castella et al., 2013).

Nevertheless, previous studies have shown that East Asian students tend to hold an incremental/growth mindset (Heine et al., 2001) and that students tend to persist rather than quit in the face of academic failure in the Confucian-heritage contexts (CHCs) (Fwu et al., 2018; Chen et al., 2021; Fwu et al., 2021). Given the cultural differences in responses to academic failure, it is reasonable to argue that the self-worth theory that was primarily based on the Western, Educated, Industrialized, Rich, and Democratic (WEIRD) samples might not be fully applicable to the CHCs (Henrich et al., 2010), where role obligations are central to achievement motivation of learners (Chen et al., 2009).

This study aims to examine the applicability of a quadripolar model of achievement motivation proposed by Covington and Omelich (1991) in a CHC context. The quadripolar model was grounded in the self-worth theory to categorize learners based on their responses to academic failure and success orientations. A re-examination of the quadripolar model in a CHC higher education institution would contribute to a better understanding of how CHC students respond to academic failure and challenges, both of which are inevitable in pursuit of higher education. The study would also uncover differences in learner characteristics between the CHCs and the WEIRD societies. We believe that only if cultural differences are considered, can insightful educational implications be made.

1.1. The quadripolar model of achievement motivation

Based on the self-worth theory, Covington and Omelich (1991) proposed a quadripolar model of achievement motivation based on the dynamics between fear of failure (FF) and hope of success (HS). Previous studies had used a bipolar model to differentiate between failure-fearing and success-oriented students by placing FF and HS on two extremes (Moulton, 1965; Clifford et al., 1988). The quadripolar model, on the other hand, was underpinned by the assumptions that FF and HS are two opposing but not mutually exclusive forces and that the two forces work in combination rather than in isolation. The dynamics between FF and HS have generated four learner categories: (1) overstrivers (high in both FF and HS), (2) self-protectors (high in FF, but low in HS), (3) failure acceptors (low in both FF and HS), and (4) optimists (low in FF, but high in HS; Covington, 1992), as shown in Figure 1.

The four categories shared some characteristics but differed to some extent (Covington and Omelich, 1991).The optimists and overstrivers both demonstrated a high level of success orientation. These students had an approach tendency toward learning, generally perceived themselves as competent, and were academically superior. However, overstrivers were also high in fear of failure. Their fears of appearing incompetent in the eyes of others would result in an avoidance tendency toward academic failure. Because the overstrivers were caught in the conflict between FF and HS, they were vulnerable to self-doubts and emotional distress. High fear of failure was also the characteristic of the self-protectors (Covington, 1992). These students had a strong avoidance tendency toward failure and suffered from anxiety due to their high fear of failure (Martin and Marsh, 2003). Failure acceptors represented "a blend of approach/avoidance tendencies" (Covington and Omelich, 1991, p. 103). These students were neither the most failure-fearing nor a success-oriented group, with their perceived ability and anxiety levels falling in between the overstrivers and self-protectors. Instead of interpreting these characteristics as indifference, Covington and Omelich (1991) suggested that the failure acceptors might turn to other sources for intellectual and emotional satisfaction than academic achievement.

The quadripolar model was examined mainly in the WEIRD contexts (Covington and Omelich, 1991; Covington, 1992; Martin and Marsh, 2003), with De Castella et al. (2013) as an exception. De Castella et al. (2013) examined the quadripolar model in a cross-cultural study, with the four

FIGURE 1
The quadripolar model of achievement motivation. Copyright © 2013 by American Psychological Association. Adapted with permission from De Castella et al. (2013).

categories and corresponding learner characteristics consistently emerging from the Japanese and Australian samples. De Castella et al. (2013) found that the self-protectors were at greatest risk among the four categories as measured by self-handicapping, defensive pessimism, learned helplessness, and disengagement from school. Self-protectors were prone to self-handicapping to deflect the cause of academic failure away from a lack of ability so as to protect their self-worth. Moreover, they felt the most helpless regarding their control over academic outcomes and thus being the most vulnerable to underachievement and disengagement from school. These results were consistent with those found in Covington and Omelich (1991). Although De Castella et al. (2013) noted that the Japanese and Australian samples represented "two highly distinct cultural settings" (p. 876), they did not explain clearly why consistent results were found across the two culturally distinct samples. Instead, the study concluded that "when it comes to protecting one's self-worth, Eastern and Western students may have much in common" (De Castella et al., 2013, p. 874).

Despite that no cultural differences were observed in De Castella et al. (2013), previous studies have indicated that East Asian students had a stronger approach tendency toward challenges, compared with the Northern American students (Heine et al., 2001; Zhang and Cross, 2011). The consistent results found in De Castella et al. (2013) might be a result of neglecting differences in the implications of academic failure between the WEIRD societies and the CHCs, that might lead to overgeneralization of learner characteristics across cultural contexts. This overgeneralization also happened in the 2018 Programme for International Student Assessment (PISA; OECD, 2019). The 2018 results seemed to concur with the self-worth theory that students in high-performing Asian countries, such as Singapore, Korea, Japan, and Taiwan, shared similar characteristics of the overstrivers of the quadripolar model. These Asian students scored above the OECD average, and so did their fear of failure; in addition, these students were less satisfied with their lives (OECD, 2019). The 2018 PISA results might attempt to portray the well-performing Asian students as overstrivers, who were caught in the conflict between FF and HS and were vulnerable to emotional distress (Covington, 1992).

In summary, according to the self-worth theory, FF would lead to an avoidance tendency, thus preventing students from taking academic risks (Clifford, 1988, 1991). Failure-fearing students were generally vulnerable to emotional distress and learned helplessness (Covington and Omelich, 1991; Martin and Marsh, 2003; De Castella et al., 2013). In addition, students who were high in FF but low in HS seemed to be at greatest risk both academically and emotionally (Covington and Omelich, 1991; De Castella et al., 2013). Success-oriented students would be more likely to approach academic challenges, feel capable of controlling their academic performance, and be in better mental health (Covington, 1992).

1.2. Learners' perceptions of academic failure in the CHCs: Role obligations and feelings of indebtedness

Heine et al. (2001) have indicated that the perceived consequences of academic failure differed across cultural contexts. The self-worth theory regards academic performance as ability estimates and interprets academic failure as a threat to personal worth because it implies low ability and will elicit shame and humiliation (Covington and Omelich, 1979). However, researchers have argued that this ability-based interpretation might not be fully applicable to the CHC contexts, where relationalism and role obligations have been an integral part of the cultural and social values (Hwang, 2000; Heine et al., 2001; Fwu et al., 2021). According to the role obligation theory of self-cultivation (ROT; Fwu et al., 2018, 2021), the CHC learners tend to perceive academic achievement and failure from personal and interpersonal perspectives. The former refers to personal obligations to exert oneself toward the ultimate good, and the latter refers to fulfilling filial obligations to parents by achieving academic excellence (Fwu et al., 2017, 2018). The two aspects will be explained in detail below.

Individuals are ascribed a role to play within hierarchical social relationships and are expected to fulfill their role obligations to achieve personal and interpersonal harmony (Heine et al., 2001; Hwang, 2001). One of the primary role obligations of the CHC learners is to study hard and strive for academic excellence (Fwu et al., 2021). Chen et al. (2009) found that the CHC learners tended to see academic achievement as a vertical goal that carries strong social and especially parental expectations (Chen et al., 2009). The role obligation of pursuing academic excellence is further reinforced by socialization processes in school, thus becoming a consensual goal shared by the CHC learners and their parents (Chen et al., 2009). In other words, the social and parental expectations will gradually develop into a perceived role obligation of CHC learners, making them not only feel expected but also obligated to work hard to excel academically (Heine et al., 2001; Chen et al., 2009). Fwu et al. (2021) have applied the ROT and provided evidence supporting that CHC learners tend to persist in the face of academic failure rather than give up.

ROT also has a personal aspect that involves self-exertion and self-cultivation (Fwu et al., 2017). These personal obligations can be traced back to ancient Chinese axioms, such as "cultivate oneself toward the ultimate good" (止於至善) and "continuously improve yourself each and every day" (苟日新, 日日新, 又日新; Fwu et al., 2021, p. 5). The role obligation of achieving academic excellence requires the CHC learners to exert and improve themselves constantly throughout schooling and even in higher education. The constant self-exertion toward academic excellence is a means through which the CHC learners fulfill the filial obligations to their parents. Given that achieving academic excellence has become a consensually shared goal between the learners and their parents, the learners will also expect themselves to work harder and perform better.

Given that the pursuit of academic excellence is perceived as role obligations, academic failure will trigger self-reflection (e.g., reflect on yourself when you failed行有不得反求諸己) and induce two types of negative emotions, including indebtedness to self (愧對自己) and indebtedness to parents (愧對父母; Fwu et al., 2018). The feelings of indebtedness are rooted in the Confucian relationalism and intertwined with child–parent role obligations (Chao, 1996; Bedford and Hwang, 2003; Kang and Larson, 2014; Kang and Raffaelli, 2015). Indebtedness is different from guilt in that guilt is triggered by wrongdoings and entails "the feeling of responsibility for transgression" (Bedford and Hwang, 2003, p. 128), whereas indebtedness is induced by failure to fulfill role obligations in social relationships. Fwu et al. (2021) has explained the feelings of indebtedness from personal and interpersonally perspectives. Interpersonally, indebtedness to parents is associated with failure to be a filial child to repay parents for their sacrifice for the family and to make them proud (Kang and Larson, 2014; Kang and Raffaelli, 2015; Fwu et al., 2021). Personally, indebtedness to self is due to failure to exert and cultivate oneself toward the ultimate good (Fwu et al., 2021). Unlike the self-worth theory that sees academic failure as a threat to personal worth, academic failure will have moral implications in the CHCs because it represents failure to fulfill role obligations of being a filial child and a better self (Chao, 1996; Kang and Larson, 2014; Fwu et al., 2021).

In their studies of the relationship between academic failure and feelings of indebtedness, Fwu et al. (2018) found that when academic failure was attributed to lack of effort, it would trigger indebtedness to parents and indebtedness to self; however, only the latter would activate subsequent effort-making, indicating that "the self is the agent for actions" (Fwu et al., 2018, p. 28). Fwu et al. (2021) further substantiated the significant effect of indebtedness to self on effort-making after academic failure. These results have shown that although indebtedness to self is a negative emotion in nature, it would also motivate an individual to exert and improve subsequently rather than give up.

1.3. The present study

A review of the literature has shown that the quadripolar model of achievement motivation was built upon the self-worth theory, and the four categories of the model have been applied to examine learner characteristics mainly in the WEIRD contexts. Even in cross-cultural studies (De Castella et al., 2013; OECD, 2019), there seemed to be no cultural differences in categorization and in learner characteristics. Given that the relationalism and role obligations have been an integral part of the CHCs, there are fundamental differences in learners' perceptions of academic failure between the CHCs and the WEIRD contexts as explained by the ROT and the self-worth theory, respectively. Using the self-worth theory alone might lose the culturally unique values, such as feelings of indebtedness to self and parents and might overlook the characteristics of the CHC learners. It is necessary to re-examine the applicability of the quadripolar model to better understand the dynamics of FF and HS and to explore how the dynamics contribute to various learner characteristics in the CHCs.

Firstly, we hypothesized that the CHC learners would perceive academic failure from both personal and interpersonal perspectives as predicted by the ROT. Thus, FF would have two sub-factors. This would be different from the studies built upon the self-worth theory that regards academic failure as a general personal factor. Secondly, given the fundamental differences in the perceptions of academic failure, this study also hypothesized that there might be additional categories emerging from the CHC sample, apart from the four existing categories, i.e., the overstrivers, self-protectors, failure acceptors, and optimists. Thirdly, we hypothesized that the additional categories might constitute a significant part of the CHC sample according to Chen et al. (2021). It was found that 43% of the CHC students in their sample held the role obligation of self-cultivation. These students showed a stronger approach tendency than avoidance toward difficult situations and had less emotional distress than those who had a fixed mindset of ability (Chen et al., 2021). Fourthly, categories emerging from the CHC sample of the current study would demonstrate varying learner characteristics as measured by (1) risk-taking tendency, (2) learned helplessness, and (3) emotional distress. These characteristics would partly concur with those that have been identified in the previous studies (Covington and Omelich, 1991; De Castella et al., 2013). Additional categories, if any, emerging from the current study would demonstrate unique learner characteristics because of the differences in interpreting academic failure between the self-worth theory and the ROT.

2. Materials and methods

2.1. Participants and procedure

Participants of the study were undergraduate seniors, i.e., students who were in their fourth year of study in a university. Data collection was undertaken in a public research-intensive university in northern Taiwan (hereafter the University). The University has been characterized by its academically challenging and competitive environment for students, making it a suitable site for the study. We acknowledged that failure experiences might be common among students across academic levels. We chose undergraduate seniors for two reasons. First, these students had accumulated more failure/success learning experiences than did their junior peers. In addition, academic risk-taking tendency was one of the criterion variables we measured. Given that challenging academic tasks, such as capstone courses, projects, or undergraduate research were an important part of studies in the senior year at the University, the undergraduate seniors would be ideal participants for the study.

An online invitation was sent to 4,364 eligible undergraduate seniors *via* the University's email system, with 1,311 students responding to the survey. The overall response rate was 30.04%. A total of 64 participants failed the attention check item and were excluded, resulting in a valid sample of 1,247 undergraduate seniors. Participation in the survey study was entirely voluntary. Prior to answering the questionnaire, all participants gave an informed consent to participate in the study. The participants completed the questionnaire online and were allowed to submit it once. By completing the questionnaire, they could decide whether to participate in a lucky draw to win a token of appreciation. The study was granted ethical approval (NTU-REC no. 202111HS007) by the Research Ethics Committee at the National Taiwan University.

2.2. Measures

The questionnaire consisted of five measures, including (1) fear of failure, (2) hope of success, (3) academic risk-taking tendency, (4) learned helplessness, and (5) emotional distress as explained in detail below. The first four measures used a 6-point Likert scale, with 1 representing strongly disagree and 6 representing strongly agree. Emotional distress was measured by the Brief Symptom Rating Scale that used a 5-point Likert scale, with 0 representing none and 4 representing very severe (Lee, 2018). The measures were translated from English to Chinese (measures 1, 2, 3, and 4) and Chinese to English (measure 5) by the first author. The translated items were backward translated by two research assistants who were fluent in English and Chinese and then checked by the first author.

Fear of failure (FF) was measured by nine items. Five of them came from the short-form of the Performance Failure Appraisal Inventory (PFAI-S) developed by Conroy et al. (2002). These items were used in De Castella et al. (2013) to measure FF. The five items corresponded to five negative consequences of failure: (a) experiencing shame and embarrassment, (b) devaluing one's self-estimate, (c) having an uncertain future, (d) losing social influence, and (e) upsetting important others (Conroy et al., 2002, p. 77). Sample items include "When I am failing, I worry about what others think about me" and "When I am failing, I am afraid that I might not have enough talent" (Conroy et al., 2002, p. 90). Considering the feelings of indebtedness are significant negative emotions that the CHC learners would experience after academic failure, we added four items, with two of them assessing indebtedness to parents (e.g., When I am failing, I feel indebted to my parents.) and with the other two items assessing indebtedness to self (e.g., When I am failing, I feel indebted to myself.), in the face of failure ($\alpha = 0.88$).

Hope of success (HS) was measured by the Hope Scale developed by Snyder et al. (1991). Eight items were adopted to assess an individual's belief about achieving goals through their agency and perceived pathways of achieving the goals. Sample items include "I can think of many ways to get out of a jam" (pathways), and "I energetically pursue my goals" (agency; $\alpha = 0.89$).

Academic risk-taking tendency was measured by the School Failure Tolerance (SFT) scale developed by Clifford (1988). The SFT has three subscales, including failure feelings, preferred difficulty, and actions in response to academic challenges. It has been found to be effective in predicting academic risk-taking, with the subscale of preferred difficulty demonstrating better effects (Clifford et al., 1988, 1989; Tan et al., 2017). The current study focused academic risk-taking on students' choices between challenging and easier tasks and on their choices of action between persistence or quitting. Thus, we excluded the failure feelings subscale. Twelve items were adopted from the preferred difficulty subscale (e.g., "I like to try difficult assignments even if I get some wrong") and the action subscale (e.g., "When I make mistakes in a difficult task, I just keep trying and trying"; $\alpha = 0.88$).

Learned helplessness was measured by the Master-orientation subscale developed by (Nurmi et al., 1995). The subscale was part of the Strategy and Attribution Questionnaire (SAQ) that assessed an individual's perceived control over their academic studies and outcomes. Nurmi et al. (1995) defined those who responded having little or no control as learned helplessness (p. 111). Seven items were used to measure learned helplessness. Sample items include "I do not have the means to affect the way my studies go" and "Careful preparation for an exam leads to good results" ($\alpha = 0.78$).

Emotional distress was measured by the Brief Symptom Rating Scale (BSRS-5; Lee, 2018). The BSRS-5 had five items and have been used widely to assess levels of emotional distress (Chen et al., 2005, 2009). Participants responded the five items on a scale of zero to four with zero representing none and four very severe. The BSRS-5 (Lee, 2018) used a four-level scale to represent mental health based on the total score of the five items. According to Lee (2018), a total score of zero to five points represented a good status of mental health (Level 1). As the level went up, a need of psychological consultation and clinical interventions increased accordingly. Six to nine points showed mild emotional distress (Level 2). A total of 10 to 14 points indicated mid-level emotional distress that required psychological or clinical consultation (Level 3). A total of 15 points and above indicated severe emotional distress and very high need of clinical interventions (Level 4). Sample items include "Get stressed out or lose temper easily" and "Feel inferior to others" ($\alpha = 0.89$).

2.3. Statistical analysis

Descriptive statistics of the five variables were shown in Appendix 1. A correlation matrix was shown in Appendix 2. Confirmatory factor analysis (CFA) and latent class analysis (LCA) were conducted to examine our hypotheses. We performed CFA to examine whether FF has two sub-factors as predicted by the ROT, including a personal and an interpersonal factor. LCA was then performed to testify whether the original quadripolar

model was applicable to the CHC sample. LCA has been used to examine "the underlying subgroups" of a population under investigation (Jeon et al., 2017, p. 912). In the present study, we used LCA to explore unobserved learner categories (i.e., latent classes) and to classify participants based on their responses to FF and HS (Jeon et al., 2017). The present study was built on the hypothesis that the CHC learners would perceive academic failure from two perspectives, personally and interpersonally. However, academic failure was mostly treated as a general factor in the previous studies guided by the self-worth theory (Conroy et al., 2003; De Castella et al., 2013; Balkis and Duru, 2019). Thus, we randomly split the sample into two subsamples (hereafter the subsample one and subsample two) to examine whether the quadripolar model (Covington and Omelich, 1991) could be replicated and to verify our hypotheses as guided by the ROT. All analyses were performed using SAS 9.4 (Lanza et al., 2007).

3. Results

3.1. A preliminary analysis of the subsample one

The subsample one consisted of around 30% of the participants ($n = 382$). This preliminary analysis was aimed at examining whether the Covington's quadripolar model (Covington and Omelich, 1991) could be replicated in the present study. We adopted the original short-form of the Performance Failure Appraisal Inventory (PFAI-S; Conroy et al., 2002), and excluded the four items of indebtedness to self and significant others.

Results of the CFA showed that a two-factor model of FF fitted the data better than did a one-factor model. The two subfactors corresponded to a personal and an interpersonal aspect, respectively. The fitness of the two-factor model was acceptable, $\chi^2 = 24.73$, df = 4, $p < 0.0001$, comparative fit index (CFI) = 0.97, root mean square error of approximation (RMSEA) = 0.10, standardized root mean squared residual (SRMR) = 0.03 (Browne and Cudeck, 1993; Hu and Bentler, 1999; Fan and Sivo, 2007; Hooper et al., 2008). The one-factor model yielded poorer model fit, $\chi^2 = 44.58$, df = 5, $p < 0.0001$, CFI = 0.95, RMSEA = 0.13, SRMR = 0.17. The relatively high RMSEA was caused by the small degree of freedom (Chen et al., 2008; Kenny et al., 2015). The chi-square difference test also indicated that two-factor model was significantly better than the one-factor model ($\chi^2 = 19.84$, df = 1, $p < 0.0001$). In summary, the CFA results showed that the CHC learners would perceive FF from the personal and interpersonal perspectives as the ROT predicted.

LCA was then performed to classify participants based on patterns of responses to FF and HS. In this preliminary analysis of the subsample one, we examined whether the original quadripolar model could be replicated. Prior to LCA, we transformed the 6-point scales of FF and HS into 2-point scales using a cut-off score of 3.5. Scores equal to or higher than 3.5 were coded as 1. Scores lower than 3.5 were coded as 0. The cut-off score was set at 3.5 because we used a 6-point Likert scale, with scores of 3 (i.e., somewhat disagree) and below representing negative responses and scores of 4 (i.e., somewhat agree) and above indicating positive responses.

The LCA results indicated that in order to replicate the four learner categories as did in Covington and Omelich (1991), we needed to adopt a six-class model rather than a four-class one. In addition to the four categories in the quadripolar model, the six-class model also included two additional categories. In summary, the CFA and LCA results supported our hypotheses. The CHC learners would perceive academic failure personally and interpersonally rather than regarding it as a general personal factor. The LCA results also indicated that the quadripolar model might not suffice to represent the CHC sample. There existed two additional learner categories that might be unique to the CHC sample.

3.2. The main study

The main study used the subsample two which consisted of around 70% of the participants ($n = 865$). The main study aimed to examine whether the two-factor model of FF fitted the data better and whether the six-class model held as suggested by the preliminary analysis. We used the adapted measure of FF, that included the original five items of the PFAI-S and the four items of indebtedness to self and significant others.

Concurring with the results reported in the section 3.1, the CFA results once again suggested a two-factor model of FF. For both the one-factor and two-factor CFA models, we specified a covariance parameter between the residuals of the items fear 2 and fear 8 because the two items were highly similar to each other in their contents. The two-factor model consisted of a personal and an interpersonal subfactor. The fitness of the two-factor model was acceptable, $\chi^2 = 324.50$, df = 25, $p < 0.0001$, CFI = 0.94, RMSEA = 0.10, SRMR = 0.04. The one-factor model yielded poorer model fit, $\chi^2 = 387.05$, df = 26, $p < 0.0001$, CFI = 0.93, RMSEA = 0.11, SRMR = 0.17. The chi-square difference test also indicated that two-factor model was significantly better than the one-factor model ($\chi^2 = 62.55$, df = 1, $p < 0.0001$). The CFA results supported our hypothesis that the CHC learners perceive FF from the personal and interpersonal perspectives as predicted by the ROT.

3.2.1. Latent class analysis

The data were fitted to five models with the number of classes ranging from five to nine. The model fit indices of each model were shown in Table 1. The five models were further evaluated against the original quadripolar model (Covington and Omelich, 1991) and the ROT (Fwu et al., 2021). Eventually, the six-class model was determined to be the most fit and parsimonious. The LCA results were supported by the theories and consistent with the results reported in the section 3.1.

TABLE 1 Model fit indices and degree of freedom of the five models.

# class	5	6	7	8	9
Log-likelihood	−9330.04	−9269.52	−9210.2	−9154.87	−9112.21
BIC	4993.55	4999.84	5008.54	5025.22	5067.21
CAIC	5082.55	5106.84	5133.54	5168.22	5228.21
Entropy	0.82	0.82	0.82	0.82	0.83
df	130982	130964	130946	130928	130910

As shown in Table 2, the six-class model included the four existing categories of the quadripolar model, i.e., the overstrivers, self-protectors, failure acceptors, and optimists. Two additional categories emerged and were labelled as the CHC overstrivers and the CHC self-protectors, respectively. It is worth noting that the quadripolar model only constituted 50.3% of the subsample two. The two CHC categories altogether accounted for the remaining 49.7%. The two CHC categories constituted a significant part of the CHC sample. Among the six categories, the CHC overstrivers constituted the highest proportion (29.9%), followed by the overstrivers (22.7%), the CHC self-protectors (19.8%), the self-protectors (12.5%), the optimists (11.6%), and the failure acceptors (3.5%).

The major differences between the two CHC categories and the four categories of the quadripolar model lied in their responses to FF. The two subfactors of FF were labelled as failing oneself and failing significant others, respectively. The two items of indebtedness to self were assigned to the subfactor of failing oneself. The other two items of indebtedness to significant others were assigned to the subfactor of failing significant others. The overstrivers and self-protectors had high responses to both failing oneself and failing significant other, whereas the CHC overstrivers and CHC self-protectors responded high to failing oneself only.

3.2.2. Profile analysis and the criterion variables

Profile analysis was performed to examine whether the six categories had distinctive characteristics as measured by academic risk-taking tendency, learned helplessness, and emotional distress. As shown in Figure 2, academic risk-taking was associated with HS. Students who were high in HS, i.e., the optimists, CHC overstrivers, and overstrivers, demonstrated stronger approach tendencies toward academic risk-taking than their counterparts who were low in HS, i.e., the CHC self-protectors, self-protectors, and failure-acceptors. The profile analysis also showed consistent results with the previous studies indicating that the self-protectors and overstrivers were at greater risk of learned helpless (De Castella et al., 2013) and emotional distress (Covington and Omelich, 1991). The CHC overstrivers and the CHC self-protectors demonstrated lower levels of learned helpless and emotional distress compared with the corresponding categories in the quadripolar model (i.e., the overstrivers and the self-protectors respectively). The optimists were the least helpless and emotionally distressed category as expected. The detailed results of the three criterion variables were explained below.

Academic risk-taking. As shown in Figure 2, it was the HS that led student to an approach tendency toward academic risks. Among the three categories that were high in HS, the optimists showed the strongest risk-taking tendency, followed by the CHC overstrivers and the overstrivers. The other three categories that were low in HS, i.e., the CHC self-protectors, the self-protectors, and the failure acceptors, were less likely to approach academic risks, with the failure acceptors showing the least risk-taking tendency.

Learned helplessness. Figure 3 showed the varying levels of learned helplessness across the six categories. The results were consistent with the previous studies showing that the self-protectors were at greatest risk of learned helpless (De Castella et al., 2013), followed by the failure acceptors, the overstrivers, and the CHC self-protector. It is worth noting that the CHC overstrivers and the optimists demonstrated similar levels of learned helplessness.

Emotional distress. Figure 4 displayed the proportions of emotional distress levels across the categories. The results substantiated the association between FF and emotional distress. The self-protectors and overstrivers were high in FF and were emotionally distressed in general. Over 62% of the self-protectors and over 53% of the overstrivers were in mid-level to severe emotional distress.

The two CHC categories were similar in distributions across the four distress levels. In addition, compared with their corresponding categories in the quadripolar model, they were less emotionally distressed. Around 27% of the CHC overstrivers and 32% of the CHC self-protectors were in mid-level to severe emotional distress. The proportions of the first level were also noteworthy. Around 51% of the CHC overstrivers and 44% of the CHC self-protectors were in good mental health, whereas around 22% of the overstrivers and 17% of the self-protectors were. Optimists were in general in good mental health as expected.

4. Discussion

Results of the preliminary analysis and the main study supported the four hypotheses. First, the two-factor model of FF indicated that CHC learners perceive academic failure from both personal and interpersonal perspectives as suggested by the ROT. Second, LCA results suggested a six-class model that consisted of the four categories in the quadripolar model and two additional CHC categories. Third, the two additional CHC categories constituted 49.7% of the sample, showing that the original quadripolar might not fully representative of the CHC sample. Fourth, the six categories demonstrated varying learner characteristics as measured by the three criterion variables. The characteristics of the four quadripolar categories were consistent with those found in the previous studies (Covington and Omelich,

TABLE 2 Conditional probabilities and group proportions of the six observed latent groups.

				Over-striver	Self-protector	Optimist	Failure acceptor	CHC over-striver	CHC self-protector
Factors		Items	Proportion	22.7%	12.5%	11.6%	3.5%	29.9%	19.8%
Fear of failure	Failing oneself	When I am failing, I worry about what others think about me.	fear1	**0.995**	**1.000**	0.289	0.603	**0.883**	**0.863**
		When I am failing, I am afraid that I might not have enough talent.	fear3	**0.983**	**1.000**	0.480	**0.722**	**0.944**	**0.896**
		When I am failing, I am afraid that I might not do my best.	fear4	**0.900**	**0.882**	0.265	0.553	**0.746**	**0.730**
		When I am failing, I feel indebted to myself.	fear9	**0.979**	**0.971**	0.240	0.299	**0.772**	**0.734**
	Failing significant others	When I am failing, it upsets my plan for the future.	fear5	**0.880**	**0.946**	0.135	0.441	0.559	0.487
		When I am not succeeding, people are less interested in me.	fear6	**0.881**	**0.855**	0.005	0.175	0.409	0.484
		When I am failing, important others are disappointed.	fear7	**0.963**	**0.923**	0.002	0.108	0.429	0.404
		When I am failing, I worry that it will embarrass my family.	fear2	**0.944**	**0.825**	0.055	0.174	0.268	0.226
		When I am failing, I feel indebted to my parents.	fear8	**0.927**	**0.902**	0.030	0.094	0.205	0.190
Hope of success	Pathway	I can think of many ways to get out of a jam.	pathway1	**0.996**	0.565	**0.999**	0.142	**1.000**	**0.886**
		There are lots of ways around any problem.	pathway2	**0.966**	0.425	**0.970**	0.219	**0.963**	**0.764**
		I can think of many ways to get the things in life that are most important to me.	pathway3	**0.993**	0.382	**0.999**	0.050	**0.993**	0.668
		Even when others get discouraged, I know I can find a way to solve the problem.	pathway4	**0.960**	0.320	**0.983**	0.156	**0.939**	0.671
	Agency	I energetically pursue my goals.	agency1	**0.979**	0.457	**0.956**	0.215	**0.977**	0.595
		My past experiences have prepared me well for my future.	agency2	**0.832**	0.243	**0.919**	0.167	**0.903**	0.392
		I meet the goals that I set for myself.	agency4	**0.814**	0.286	**0.901**	0.086	**0.880**	0.437
		I've been pretty successful in life.	agency3	0.451	0.099	0.558	0.151	0.408	0.158

Conditional probabilities greater than 0.700 were marked in bold.

1991; De Castella et al., 2013). The two additional CHC categories revealed unique characteristics that could differentiate them from their corresponding categories in the quadripolar model. Theoretical significance of the study and practical implications derived are discussed as follows.

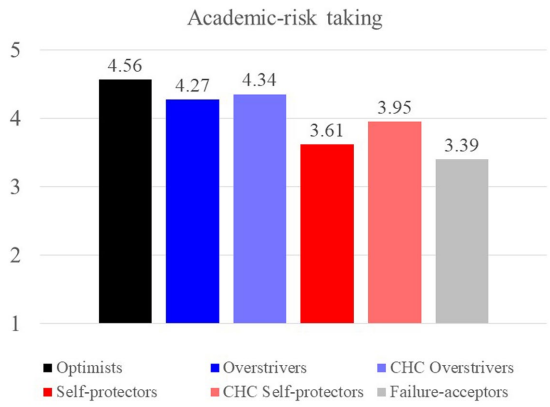

FIGURE 2
Academic-risk taking tendency across categories.

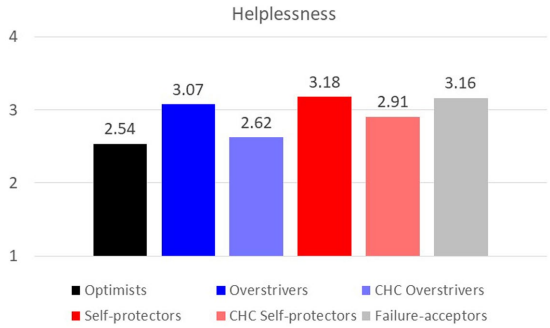

FIGURE 3
Levels of learned helplessness across categories.

4.1. FF as a general factor vs. with two subfactors

As shown in sections 3.1 and 3.2, the CFA results consistently supported our first hypothesis that FF included two subfactors as predicted by the ROT and that the CHC learners would perceive academic failure from both personal and interpersonal perspectives (Fwu et al., 2018, 2021). Furthermore, the two types of negative emotions, i.e., indebtedness to self and to parents were assigned to the subfactors of failing oneself and failing significant others, respectively. Given the fundamental differences in the structure of FF, the LCA results also supported our hypothesis that there existed additional categories in addition to the four categories in the quadripolar model. The two CHC categories, including the CHC overstrivers and the CHC self-protectors, emerged from the two subsamples consistently. The four quadripolar categories only accounted for half of the sample (50.3%), and the two additional CHC categories constituted the other half (49.7%). These results pointed out the inadequacy of the self-worth theory in explaining achievement motivation in the CHCs where relationalism and role obligations constitute an integral part of the cultural and social values (Hwang, 2000; Heine et al., 2001; Fwu et al., 2021).

Low endorsement of the subfactor of failing significant others differentiated the two additional CHC categories from their corresponding quadripolar categories. The CHC overstrivers and the CHC self-protectors only responded high to the subfactor of failing oneself, whereas the overstrivers and self-protectors responded high to both subfactors. The LCA results suggested that the two CHC

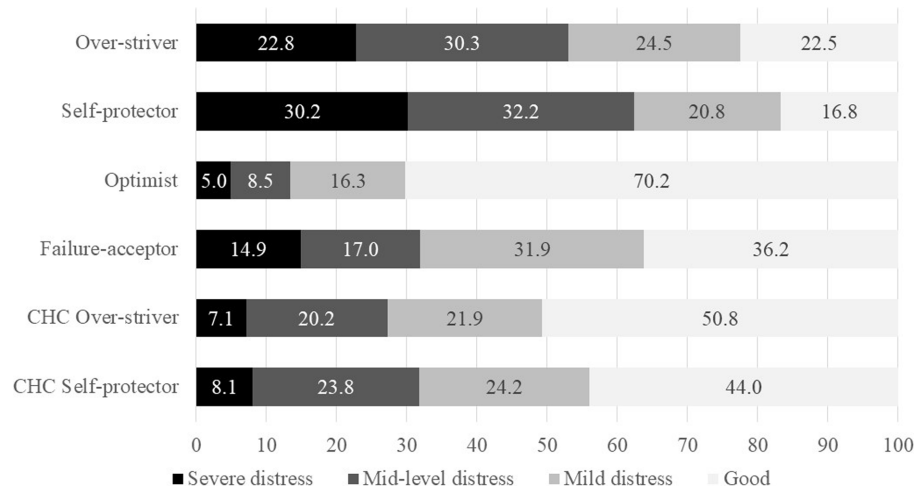

FIGURE 4
Levels of emotional distress across categories (by percentage).

categories had a stronger tendency toward self-reflection (Fwu et al., 2018) than toward social obligations after academic failure.

A possible explanation of the low endorsement of failing significant others as found in the two additional CHC categories might be that the participants of the present study were undergraduate seniors who were about to complete their undergraduate studies. University education could be challenging particularly in a research-intensive university where the current study was undertaken. It seemed reasonable to assume that the students who had high endorsement of failing oneself but low of failing significant others were able to find personal meanings in their undergraduate studies, that could drive them to constantly exert and improve themselves to sail through academic challenges and failure. On the other hand, the obligation to fulfill expectations of significant others were secondary.

However, it was worth noting that the two quadripolar categories, i.e., the overstrivers and self-protectors demonstrated high endorsement of the two subfactors of FF in the present study, and that the two categories constituted around 35% of the sample. It seemed that not only fear of failing oneself but also fear of failing significant others was a significant characteristic of these students.

4.2. Differences in learner characteristics between the two CHC categories and the two corresponding quadripolar categories

Results of the profile analysis in the main study were consistent with the previous studies that FF would lead to an avoidance tendency toward academic risk-taking (Clifford, 1988, 1991; Tan et al., 2017). However, the results of the profile analysis also revealed differences between the two CHC categories and their corresponding quadripolar categories. The major differences were their levels of emotional distress. The previous studies have shown that the overstrivers and self-protectors were vulnerable to anxiety due to their high FF (Covington and Omelich, 1991; Covington, 1992; Martin and Marsh, 2003). The present study found that although the overstrivers and the self-protectors were emotionally distressed in general, the CHC overstrivers and CHC self-protectors were not. Around half of the CHC overstrivers and around 44% of the CHC self-protectors showed good mental health. The results suggest that fears of failing students themselves might not necessarily result in poorer mental health as did FF in general (Covington and Omelich, 1991; Covington, 1992). This might debunk the myth that Asian students would strive for academic excellence at the cost of their psychological wellbeing as implied in the PISA 2018 report (OECD, 2019).

In addition to levels of emotional distress, the present study also found difference in academic risk-taking tendency between the self-protectors and the CHC self-protectors. The two categories were both high in FF and low in HS, and according to the self-worth theory, these students would demonstrate a strong avoidance tendency toward academic risk-taking. However, the profile analysis showed that the CHC self-protectors demonstrated higher academic risk-taking tendency than did the self-protectors. The results seem to concur with the previous studies that indebtedness to self could trigger subsequent effort making after academic failure, whereas indebtedness to parents could not (Fwu et al., 2018, 2021). Given that the CHC self-protectors only responded high to the subfactor of failing oneself, it is reasonable to assume that the intention to avoid failing oneself might not necessarily lead to an avoidance tendency toward academic challenges. Instead, it might help facilitate academic risk-taking to a lesser extent compared with HS.

4.3. Practical implications

The findings of the present study would offer several practical implications. Students are usually encouraged to strive for and celebrate academic excellence; however academic risk-taking and failure are inevitable in pursuit of higher education. Given that around 85% of the CHC students in the main study were high in FF, including the two overstrivers and two self-protectors, it is necessary for higher education institutions to provide students with ample psychological support and mental health resources. It would be helpful to create failure-friendly environments where students feel free to share and discuss failure experiences with peers and teachers. Learning environments that encourage an open discussion on failure experiences would remind students that failure happens and is normal and help them see failure in a constructive manner to channel their fears into opportunities.

In addition, in order to enhance HS of students, Covington and colleagues (Covington, 1992; Covington et al., 2017) have advocated engaging students with inquiry-based activities, such as capstone tasks. Inquiry-based activities were grounded in the belief that learning takes place through discovery rather than transmission. These activities emphasize not only learning products but also processes. They allow students to choose topics of inquiry to tap into curiosity and intrinsic motivation. An exploration of the effects of this pedagogical approach would be helpful in finding a way to encourage students to approach learning with hope of success.

Lastly, we would like to argue that although the failure acceptors constituted a very small part of the sample in the main study (3.5%), these students required more attention than they had received in the literature. The failure acceptors showed the least risk-taking tendency among the six categories, that could disadvantage them in such competitive learning environments as research-intensive universities where academic challenges were inevitable (Tan et al., 2017). Engaging the failure-accepting students with inquiry-based learning activities might help them find an area of interest as sources for intellectual and emotional satisfaction.

4.4. Limitations and future research

This study has several limitations. First, the data were collected from one research-intensive university. Generalization of the findings

should be treated with caution considering the diversity of demographics and variations in learner characteristics across research-intensive universities in the CHCs and other cultural settings. Secondly, although the LCA results indicated that the CHC overstrivers and CHC self-protectors were two different categories and that their academic risk-taking tendency differed, their perceived learned helplessness and levels of emotional distress were similar. Future studies might explore learner characteristics that could further differentiate between the two CHC categories. Thirdly, this study found that students with different achievement motivation demonstrated different levels of emotional distress and learned helpless and responded to academic risk-taking differently. It remains unclear where this mechanism might be altered through pedagogical interventions. Future studies might explore whether the proposal of inquiry-based learning by Covington and colleagues (Covington, 1992; Covington et al., 2017) stands to provide illuminating implications for teaching and learning in higher education.

5. Conclusion

This study examined the applicability of the quadripolar model of achievement motivation (Covington and Omelich, 1991) in a CHC higher education institution characterized by its academically challenging and competitive environment for the students. Apart from the four categories of the quadripolar model, two CHC categories emerged from the sample. The two CHC categories constituted half of the sample and demonstrated different learner characteristics compared with their corresponding quadripolar categories. The results may help debunk the myth that learner characteristics in the CHCs are identical to those observed in the WEIRD contexts. The fundamental differences in FF further indicated the inadequacy of the self-worth theory in explaining achievement motivation in the CHCs where relationalism and role obligations are significant parts of the cultural traditions. The study demonstrates the importance of considering cultural differences rather than entirely transplanting models built primarily upon the WEIRD contexts to non-WEIRD settings.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by Research Ethics Committee, National Taiwan University (NTU-REC no. 202111HS007). The patients/participants provided informed consent in electronic format to participate in this study.

Author contributions

GL and B-JF conceptualized the study. GL, B-JF, and T-RY formulated the hypotheses and designed the study, with Y-KC contributing to the discussions. T-RY and Y-KC organized and performed the statistical analyses. GL, B-JF, and T-RY interpreted the results and findings, with Y-KC contributing to the discussions. Drafts of the manuscript were written by GL and revised by B-JF. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Balkis, M., and Duru, E. (2019). Procrastination and rational/irrational beliefs: a moderated mediation model. *J. Ration. Emot. Cogn. Behav. Ther.* 37, 299–315. doi: 10.1007/s10942-019-00314-6

Bedford, O., and Hwang, K.-K. (2003). Guilt and shame in Chinese culture: a Cross-cultural framework from the perspective of morality and identity. *J. Theory Soc. Behav.* 33, 127–144. doi: 10.1111/1468-5914.00210

Beery, R. G. (1975). Special feature: fear of failure in the student experience. *Person. Guid. J.* 54, 191–203. doi: 10.1002/j.2164-4918.1975.tb04220.x

Browne, M. W., and Cudeck, R. (1993). "Alternative ways of assessing model fit" in *Testing structural equation models*. eds. K. A. Bollen and J. S. Long (Newbury Park, CA: Sage), 136–162.

Chao, R. K. (1996). Chinese and European American mothers' beliefs about the role of parenting in children's school success. *J. Cross-Cult. Psychol.* 27, 403–423. doi: 10.1177/0022022196274002

Chen, W.-J., Chen, C.-C., Ho, C.-K., Lee, M.-B., Chung, Y.-T., Wang, Y.-C., et al. (2009). The suitability of the BSRS-5 for assessing elderly who have attempted suicide

and need to be referred for professional mental health consultation in a metropolitan city, Taiwan. *Int. J. Geriatr. Psychiatry* 24, 1151–1157. doi: 10.1002/gps.2239

Chen, F., Curran, P. J., Bollen, K. A., Kirby, J., and Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociol. Methods Res.* 36, 462–494. doi: 10.1177/0049124108314720

Chen, S.-W., Wang, H.-H., Wei, C.-F., Fwu, B.-J., and Hwang, K.-K. (2009). Taiwanese students' self-attributions for two types of achievement goals. *J. Soc. Psychol.* 149, 179–194. doi: 10.3200/SOCP.149.2.179-194

Chen, H.-C., Wu, C.-H., Lee, Y.-J., Liao, S.-C., and Lee, M.-B. (2005). Validity of the five-item brief symptom rating scale among subjects admitted for general health screening. *J. Formosan Med. Assoc.* 104, 824–829. doi: 10.29828/JFMA.200511.0008

Chen, Y. K., Yang, T. R., Li, G. Y., and Fwu, B. J. (2021). Types of belief holders predict mental health and persistence after failure in a Confucian context [Paper presentation]. 32nd International Congress of Psychology, Prague, Czech Republic.

Clifford, M. M. (1988). Failure tolerance and academic risk-taking in ten- to twelve-year-old students. *Br. J. Educ. Psychol.* 58, 15–27. doi: 10.1111/j.2044-8279.1988.tb00875.x

Clifford, M. M. (1991). Risk taking: theoretical, empirical, and educational considerations. *Educ. Psychol.* 26, 263–297. doi: 10.1080/00461520.1991.9653135

Clifford, M. M., Kim, A., and McDonald, B. A. (1988). Responses to failure as influenced by task attribution, outcome attribution, and failure tolerance. *J. Exp. Educ.* 57, 17–37. doi: 10.1080/00220973.1988.10806493

Clifford, M. M., Lan, W. Y., Chou, F. C., and Qi, Y. (1989). Academic risk-taking: developmental and cross-cultural observations. *J. Exp. Educ.* 57, 321–338. doi: 10.1080/00220973.1989.10806514

Conroy, D. E., Metzler, J. N., and Hofer, S. M. (2003). Factorial invariance and latent mean stability of performance failure appraisals. *Struct. Equ. Model. Multidiscip. J.* 10, 401–422. doi: 10.1207/S15328007SEM1003_4

Conroy, D. E., Willow, J. P., and Metzler, J. N. (2002). Multidimensional fear of failure measurement: the performance failure appraisal inventory. *J. Appl. Sport Psychol.* 14, 76–90. doi: 10.1080/10413200252907752

Covington, M. V. (1984). The self-worth theory of achievement motivation: findings and implications. *Elem. Sch. J.* 85, 5–20. doi: 10.1086/461388

Covington, M. V. (1992). *Making the grade: A self-worth perspective on motivation and school reform*. New York, NY: Cambridge University Press.

Covington, M. V., and Omelich, C. L. (1979). Effort: the double-edged sword in school achievement. *J. Educ. Psychol.* 71, 169–182. doi: 10.1037/0022-0663.71.2.169

Covington, M. V., and Omelich, C. L. (1991). "Need achievement revisited: verification of Atkinson's origional 2x2 model" in *Stress and emotion: Anxiety, anger, and curiosity.* eds. C. D. Spielberger, I. G. Sarason, Z. Kulesar and G. L. V. Heck, vol. *14* (New York, NY: Hemisphere), 85–105.

Covington, M. V., von Hoene, L. M., and Voge, D. J. (2017). *Life beyond grades: Designing college courses to promote intrinsic motivation*. Cambridge, UK: Cambridge University Press.

De Castella, K., Byrne, D., and Covington, M. V. (2013). Unmotivated or motivated to fail? A cross-cultural study of achievement motivation, fear of failure, and student disengagement. *J. Educ. Psychol.* 105, 861–880. doi: 10.1037/a0032464

Fan, X., and Sivo, S. A. (2007). Sensitivity of fit indices to model misspecification and model types. *Multivar. Behav. Res.* 42, 509–529. doi: 10.1080/00273170701382864

Fwu, B.-J., Chen, S.-W., Wei, C.-F., and Wang, H.-H. (2017). The mediating role of self-exertion on the effects of effort on learning virtues and emotional distress in academic failure in a confucian context. *Front. Psychol.* 7:2047. doi: 10.3389/fpsyg.2016.02047

Fwu, B.-J., Chen, S.-W., Wei, C.-F., and Wang, H.-H. (2018). I believe; therefore, I work harder: the significance of reflective thinking on effort-making in academic failure in a Confucian-heritage cultural context. *Think. Skills Creat.* 30, 19–30. doi: 10.1016/j.tsc.2018.01.004

Fwu, B.-J., Wei, C.-F., Chen, S.-W., and Wang, H.-H. (2021). "To work hard or not? The conflicting effects of negative emotions on persistence after academic failure in a Confucian heritage cultural context" in *Emotions in learning, teaching, and leadership: Asian perspectives*. eds. C. Junjun and R. B. King (Oxon: Routledge), 3–17.

Heine, S. J., Kitayama, S., Lehman, D. R., Takata, T., Ide, E., Leung, C., et al. (2001). Divergent consequences of success and failure in Japan and North America: an investigation of self-improving motivations and malleable selves. *J. Pers. Soc. Psychol.* 81, 599–615. doi: 10.1037/0022-3514.81.4.599

Henrich, J., Heine, S. J., and Norenzayan, A. (2010). The weirdest people in the world? *Behav. Brain Sci.* 33, 61–83. doi: 10.1017/S0140525X0999152X

Hooper, D., Coughlan, J., and Mullen, M. R. (2008). Structural equation modelling: guidelines for determining model fit. *Electron. J. Bus. Res. Methods* 6, 53–60.

Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model. Multidiscip. J.* 6, 1–55. doi: 10.1080/10705519909540118

Hwang, K.-K. (2000). Chinese relationalism: theoretical construction and methodological considerations. *J. Theory Soc. Behav.* 30, 155–178. doi: 10.1111/1468-5914.00124

Hwang, K.-K. (2001). The deep structure of Confucianism: a social psychological approach. *Asian Philosophy* 11, 179–204. doi: 10.1080/09552360120116928

Jeon, S., Lee, J., Anthony, J. C., and Chung, H. (2017). Latent class analysis for multiple discrete latent variables: a study on the association between violent behavior and drug-using behaviors. *Struct. Equ. Model. Multidiscip. J.* 24, 911–925. doi: 10.1080/10705511.2017.1340844

Kang, H., and Larson, R. W. (2014). Sense of indebtedness toward parents: Korean American emerging adults' narratives of parental sacrifice. *J. Adolesc. Res.* 29, 561–581. doi: 10.1177/0743558414528979

Kang, H., and Raffaelli, M. (2015). Personalizing immigrant sacrifices: internalization of sense of indebtedness toward parents among Korean American young adults. *J. Fam. Issues* 37, 1331–1354. doi: 10.1177/0192513X14567955

Kenny, D. A., Kaniskan, B., and McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociol. Methods Res.* 44, 486–507. doi: 10.1177/0049124114543236

Lanza, S. T., Collins, L. M., Lemmon, D. R., and Schafer, J. L. (2007). PROC LCA: a SAS procedure for latent class analysis. *Struct. Equ. Model. Multidiscip. J.* 14, 671–694. doi: 10.1080/10705510701575602

Lee, M. B. (Ed.). (2018). Brief symptom rating scale (BSRS-5). Taiwan society of suicidology and Taiwan Suicide Prevention Center.

Martin, A. J., and Marsh, H. W. (2003). Fear of failure: friend or foe? *Aust. Psychol.* 38, 31–38. doi: 10.1080/00050060310001706997

Moulton, R. W. (1965). Effects of success and failure on level of aspiration as related to achievement motives. *J. Pers. Soc. Psychol.* 1, 399–406. doi: 10.1037/h0021749

Nurmi, J.-E., Salmela-Aro, K., and Haavisto, T. (1995). The strategy and attribution questionnaire: psychometric properties. *Eur. J. Psychol. Assess.* 11, 108–121. doi: 10.1027/1015-5759.11.2.108

OECD (2019). *PISA 2018 results (volume III): What school life means for students' lives*. Paris: OECD Publishing.

Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., et al. (1991). The will and the ways: development and validation of an individual-differences measure of hope. *J. Pers. Soc. Psychol.* 60, 570–585. doi: 10.1037/0022-3514.60.4.570

Tan, E. W. S., Lim, S. W. H., and Manalo, E. (2017). Global-local processing impacts academic risk taking. *Q. J. Exp. Psychol.* 70, 2434–2444. doi: 10.1080/17470218.2016.1240815

Zhang, M., and Cross, S. E. (2011). Emotions in memories of success and failure: a cultural perspective. *Emotion* 11, 866–880. doi: 10.1037/a0024025

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Appendix 1

Descriptive statistics of the variables.

	Mean	Standard deviation	Skewness	Kurtosis	Maximum	Minimum
Fear of failure	3.91	0.95	−0.35	0.19	6	1
Hope of success	4.06	0.79	−0.42	0.84	6	1
Academic Risk taking	4.20	0.88	−0.35	0.70	6	1
Helplessness	2.86	0.96	0.41	0.18	6	1
Emotional distress	7.85	5.28	0.44	−0.71	20	0

Emotional distress was calculated by the total score of all items, and the remaining variables were calculated by the average score of all items.

Appendix 2

Correlation matrix for the variables.

	FF	HS	RT	HL	ED
Fear of failure (FF)					
Hope of success (HS)	−0.21				
Academic risk taking (RT)	−0.09	0.49			
Helplessness (HL)	0.19	−0.17	−0.18		
Emotional distress (ED)	0.49	−0.24	−0.09	0.31	

All correlations significant at $\alpha = 0.01$ level.

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The Dialectical Mandala Model of Self-cultivation

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This study explores the development of a cross-cultural primary ontological model that can help self-cultivation practitioners illuminate their path and help researchers identify the complex implications, context, and progression of self-cultivation in diverse cultures, especially those associated with Buddhism, Taoism, and Confucianism. Integrating self-cultivation traditions into social science research from the perspective of subject-object dichotomy is difficult. However, the assimilation of the mutual implication of subject and object in the Avataṃsaka worldview helps resolve this issue. This study employs the Buddhist tetralemmic dialectic (catuṣkoṭi), which goes beyond the limitations of dualistic and reductionist logic, to construct the Dialectical Mandala Model of Self-cultivation as the first of a two-step epistemological strategy. The model provides a universal framework for the multifaceted and systemic analysis of self-cultivation traditions so that future research can further develop additional culturally specific ontologies and psychological models in the second step of the strategy. As in a research map, this model could help researchers make ontological commitments, understand self-cultivation more comprehensively, and determine whether they have overlooked any research domain.

KEYWORDS

cross-cultural, dialectic, mandala, ontological model, self-cultivation

1. Introduction

1.1. Self-cultivation as a cross-cultural phenomenon

Self-cultivation is the development and integration of mind and body through self-effort; it aims to develop one's potential, integrate experiences and awareness, reach beyond primitive states of being (Tang, 2015), and, from the Western perspective, attain transcendence (Peters, 2020). Concepts and practices of self-cultivation are found in many cultures, but they are accomplished through diverse processes and worldviews in each (Hwang and Chang, 2009). For example, the German idea of self-cultivation (*Bildung*) can be historically traced to Hegel and is defined as a disciplined effort directed at spiritual self-development (Gadamer, 2004; Peters, 2020). By contrast, self-cultivation, as an essential component of established East Asian ethical values, reflects an inherent tendency toward harmony and wholeness, which culminates in a more natural state beyond the self (Tang, 2015; Shiah, 2016; Yü, 2016).

Although many traditions use the term, the related concepts significantly differ in each tradition. For example, the classical idea of transcendence in Greek-inspired traditions—in which the object and goal (e.g., God and heaven) are independent of the individual—has no counterpart in certain Eastern traditions such as Zen Buddhism. Accordingly, some Zen masters, such as Mazu Daoyi (709–788) and Xuefeng Yicun (822–908), posit internal "ghosts" rather than an external God to help their disciples work on self-cultivation (*Taishō Tripiṭaka* [hereafter "T."] 51, p. 351c, ll. 19–20); therefore, they emphasize "ordinary mind" and "no transcendence" (Magid, 2012, p. 86; T. 51, p. 440a, ll. 3–6). For Zen masters, self-cultivation is not about changing things or denying the self; it is about leaving things as they are, as long as the mind is no longer obscured by presuppositions about the self (Sanskrit [Skt.] *ātma-grāha*). Analogously, Yü (2016) interprets the kernel of self-cultivation as "inward transcendence" because self-cultivation in Chinese traditions is grounded in the holistic concept that the world and the self are one (p. 16). Such ontological differences in concept and practice have barely been addressed in cross-cultural research.

1.2. The dilemma of cross-cultural research: The need to develop ontological models

Cross-cultural research on self-cultivation and spirituality is faced with a fundamental dilemma: psychological variables are observed and measured under different cultural conditions, sometimes without an ontological understanding of these variables (Genkova, 2015). Using identical measuring instruments (e.g., questionnaires) and procedures does not guarantee measurement equivalence, because both the stimuli (e.g., the questions) and the responses may have different meanings in diverse cultures (Byrne and Watkins, 2003). For example, Hofstede (2011) identifies six dimensions that differentiate one culture from another. One of these is individualism versus collectivism, referring to how one relates to others within the same community. Yet, such measurement is inadequate in understanding non-Westerners, as it fails to probe the cultural systems underlying this dimension. For example, Chinese people might score high on collectivism, but this may merely indicate a lower degree of individualism in the Western sense. Correspondingly, Fiske (2002) criticizes so-called collectivism as "an abstraction that formalizes our ideological representation of the antithetical other, a cultural vision of the rest of the world characterized in terms of what we imagine we are not" (p. 84).

Nisbett (2004) regards "harmony" as the Chinese counterpart to Greek "agency" and, on this ground, explains why East Asian cultures are more field-dependent/collectivist in orientation, whereas Westerners retain the field-independent/individualist cognitive style of ancient Greece (p. 5). However, Glebkin (2015) challenges Nisbett's comparison by pointing out that the cognitive style of ancient Greek culture is field-dependent/collectivist when compared to that of the modern West. Therefore, Glebkin suggests a universal multilevel model of a mental structure where the field-dependent/collectivist cognitive style occupies a deeper level than that of the field-independent/individualist, thereby integrating Nisbett's cultural dichotomy into the different levels of a structure.

The unilateral and oversimplified use of terms from different cultures is an obstacle to the study of self-cultivation. Some ontological premise must have underlain any such investigation, even implicitly, and yet, paradoxically, the implicit nature of these ontologies is, in part, the source of the dilemma of cross-cultural research (Slife and Richardson, 2008). An explicit, and thus examinable, ontology would be more beneficial for research than an implicit one. An ontological model defines interdependent properties and relationships across categories and ideas, and serves multiple functions, including supporting norms, sharing knowledge, and making ontological commitments to address the incommensurability problem (Feyerabend, 1981, p. xi).

Some researchers have adopted specific traditional models of self-cultivation as the ontological bases of related scientific research. A remarkable example of this is Edward Canda applying the Ten Oxherding Pictures of Zen to guide and evaluate social workers' spiritual development (Canda and Gomi, 2019). The Ten Oxherding Pictures of the 12th-century Chinese Zen master Kuoan Shiyuan describe an ox herder (representing the self) searching for his ox (symbolizing the primordial nature of the self), which remains one of the best models for explicating the awakening process. However, a conceptual model directly stemming from a specific religious tradition is unavoidably tied to the corresponding religious ontology. Therefore, it barely crosses the cultural boundaries to be understood in a consensual way unless transformed into an integrative-philosophical or scientific model with an examinable ontology. Psychological variables hardly explain behaviors in different cultures without the ontological commitment to a cross-cultural ontology. Accordingly, there is an urgent need to develop a preliminary cross-cultural ontological model and ground the research in it, rather than to unilaterally create measuring instruments without a clear understanding of what needs to be measured.

To address this requirement, researchers have suggested methods of adopting universals (e.g., universal cognitive mechanisms) from psychology, biology, anthropology, and linguistics to analyze the underlying structures of cultural systems (Shweder et al., 2006; Genkova, 2015; Bhatia, 2019). However, Archer (1995) asserts that a "fallacy of conflation" in methodology occurs when a psychological theory on cultural phenomena confuses "cultural systems" with "socio-cultural interaction" (p. 58). Therefore, a cultural system cannot be explored *via* empirical research methods such as experiments, questionnaires, and interviews. Instead, the initial steps must include the adoption of humanities research methodologies to analyze the cultural morphostasis/morphogenesis in classics (Archer and Elder-Vass, 2012) and thereby overcome the limitation of positivism that allegedly sustains the objectivity of science but violates the irreducibility of perspectives. Thus, an appropriate cross-cultural ontology can be formed through a contrastive analysis of diverse cultural systems and retroductive argumentation that makes

non-linear inferences about the underlying structure of phenomena (Bhaskar, 1975).

1.3. An epistemological strategy for developing the required ontological models

To construct the ontological model required to resolve this dilemma, this study adopts Hwang's (2014) epistemological strategy to develop "culture-inclusive theories" that explain the social behaviors in a given culture (p. 40). This strategy follows the principle of "one mind, many mentalities" (Shweder et al., 2006, p. 871): the deep structures and functions of the human mind are the same across all cultures, while the mentalities develop differently in accordance with the respective cultures. Thus, the strategy adopted is a two-step one. The first step focuses on the "one mind" (universal human mind) and constructs an ontologically universal model as an integrative framework. The second step uses this framework to analyze and integrate specific cultural systems and develop additional culture-specific ontological models. Indigenous psychologists can use these culturally specific ontologies to develop culture-inclusive theories of their own and profoundly probe the "many mentalities." Both universal and culture-specific ontological models are required for this approach. An explicit example of the culture-specific model constructed using this strategy is the Jun-zi Self-cultivation Model proposed by Xu et al. (2022). They apply Hwang's (2011) Mandala Model of Self (MMS) as a universal framework to compare, interpret, analyze, and integrate the traditional models of self-cultivation in the Chinese classics *I Ching* (易經) and *Tao Te Ching* (道德經), aiming to transform the cultural system into a psychological theory.

The contradictory perspectives on spiritual hierarchies bring about some methodological considerations essential to constructing the universal model in the first step of Hwang's epistemological strategy. Friedman et al. (2010) reviewed current ontological models of spiritual development to differentiate "vertical models" (or "stage theories") that establish development hierarchies from "horizontal" ones that abandon any predetermined spiritual ranking and regard spiritual development as "a horizontal expansion of self-concept" (p. 79). For example, Fowler's (1981) vertical model of faith development, which assumes a nearly invariant and culturally universal sequence of seven stages, has developed into a robust empirical research tradition. However, as Friedman et al. (2010) point out, this research rests on Western concepts of spirituality and transcendence and may not be universally applicable (p. 88). Wilber's (2007) integral theory, as a transpersonal perennialist model, provides an overall ontology that integrates the development stages of major traditions into a coherent framework. It is considered the "most impressive example of a vertical model" (Friedman et al., 2010, p. 86). However, based on Ferrer's (2011) criticism of the pre-established hierarchical rankings of spiritual traditions, states, and orientations, Wilber's model ontologically entails the "dogmatic privileging of a single tradition as paradigmatic" and thus brings paradigmatic limitations into further theory construction and empirical research (p. 2). By contrast, Ferrer's (2011) horizontal model reframes human spirituality as emerging from people's "co-creative participation" in a generative power of reality (p. 2).

Considering these contradictory perspectives, this study draws on Ferrer's (2011) criticism of Wilber's perennialist approach as a complementary perspective to self-cultivation modeling. This has two equally important guiding principles. First, the construction of the required universal model should fulfill the first step of Hwang's strategy by adopting an appropriate form of dialectics, rather than a specific dogma or empirical observation, to "vertically unfold" the layers of self-cultivation sufficient to include all essential and irreducible domains. Root metaphors (such as *taiji* mentioned below) borrowed from various traditions are often used to symbolize a substantive reality of phenomena or the fundamental entity that founds all other entities. However, as the sixth-century Madhyamaka philosopher Bhāvaviveka argued, the asserted foundational entity that is supposedly intrinsically real is, ultimately, neither substantial nor independent and therefore "non-foundational" (*Madhyamakahrdayakārikā*, see Eckel, 2008, p. 73). Apart from being conceptually composed and dialectically identified in a collective whole, nothing withstands as the substance or foundation of other phenomena (Thakchoe, 2017). Therefore, to avoid hypothesizing controversial fundamental entities, the construction of the required model should be dialectical; all ontological domains should be interdependently defined in the whole model and thus be non-foundational. Second, the construction should unfold the ontological hierarchies on an appropriate theoretical model of the self that analyzes the universal ground of human motivations and bridges the subject-object dichotomy, which is the limitation of the epistemology associated with the subject-object ontology inaugurated by Descartes.

1.4. Previous psychological models of self-cultivation and their limitations

There are three psychological models of self-cultivation that adopt a specific form of dialectics to unfold Eastern traditions' self-cultivation stages vertically. The first, the Taiji Model of Self (Wang et al., 2019), divides self-structure into *yin* and *yang*—etymologically, "the shady and sunny side of the mountain" (Stein, 2010, p. 63). *Yin* represents the "small self" that serves the interests of the minority, while *yang* represents the "large self" that serves the majority's interests. Similarly, in the second model, the Taiji Model of Taoist Self (Wang and Wang, 2020), *yin* represents the "soft self" that reflects "softness, simplicity, non-doing, emptiness, and nature," while *yang* represents the "hard self" that reflects "hardness, complexity, action, fullness, and artificiality." In the third model, the Taiji Model of Buddhist Self (Wang and Wang, 2020), *yin* represents the "dusty self," clinging to the "five root annoyances," while *yang* represents the

untroubled "pure self." These three models differentiate the self-development process into four or five realms in accordance with the degree of harmony between *yin* and *yang*.

The three models adopt the reductionist paradigm of a dual or dialectical self (e.g., the small and large selves). This approach is oversimplified because it still defines the self in a subject-object dichotomy, similar to that in the Cartesian model of substantial existence of the self. It interprets *yin* and *yang* as dualistic domains, thus failing to exploit two other concepts essential for bridging the subject-object dichotomy: namely, *taiji*—the ultimate from which *yin* and *yang* originate—and *wuji*—best translated as "the limitless" (Ching, 2000, p. 15; Zhang and Ryden, 2002, p. 71). However, *yin*, *yang*, *taiji*, and *wuji* form a set of root metaphors of Chinese metaphysics; therefore, they ontologically imply each other and are mutually manifest. Accordingly, these three models are neither sufficiently comprehensive ontologies of self-cultivation nor applicable as prototypes of the required ontological model.

Theoretical models founded on a subject-object dichotomy cannot encompass the Buddhist notion of "no transcendence" (the term "transcendence" used here being similar to the classical idea of transcendence in Greek-inspired traditions rather than other diverse meanings of transcendence, such as "inward transcendence" used by some Eastern philosophers) or the nondualistic mutual implication of subject and object. Consequently, this study initiates a preliminary development of the ontological model of self-cultivation in line with Hwang's MMS, which fits the form of Buddhist tetralemmic dialectics that helps incorporate diverse worldviews (delineated in Subsection 2.3). The MMS is inspired by the Borobudur mandala, a massive Buddhist monument in central Java, Indonesia (Hwang, 2011). Viewed from above, the multilevel Borobudur takes the form of a tantric mandala that symbolizes the nature of the mind and the dialectical process of self-cultivation. The central dome of the Borobudur, surrounded by 72 Buddha statues with different *mudras* (symbolic hand gestures), represents the kernel and goal of self-cultivation—great harmony. Founded on a holistic worldview that dismantles the reified subject-object dichotomy, the MMS has laid the groundwork for developing cultural psychology in non-Western countries (Hwang, 2011; Shiah and Hwang, 2018). Based on the MMS, Xu et al. (2022) propose the Jun-zi Self-cultivation Model to outline the process through which an individual (Chinese: 小人; *xiao-ren*) becomes an ideal person (Chinese: 君子; *jun-zi*). The model focuses on presenting the progressive state of *jun-zi* rather than analyzing the structure of the self, but it does not outline the transcendent or immanent domains essential for building an ontology of self-cultivation.

1.5. The present work: A dialectically constructed ontological model

The primary ontological model of self-cultivation that deals with all essential and irreducible domains can be developed by dialectically extrapolating Hwang's MMS into a multilevel model.

This study bridges the subject-object dichotomy by using a tetralemmic dialectic, the Four-layered Catuṣkoṭi Framework proposed by the Madhyamaka master Jizang (549–623), to construct a multilevel framework (Figure 1) called the Dialectical Mandala Model of Self-cultivation (DMMS). It proposes a primary model that dialectically unfolds the essential, irreducible, and universal ontological domains of self-cultivation. Responding to the 16 domains (presented in Figure 1) of the DMMS, it recognizes, compares, and synthesizes the representative terms from diverse cultural systems, particularly those of Buddhism, Taoism, and Confucianism.

The DMMS identifies the implications of the 16 self-cultivation-related domains of discourse in diverse cultures. The remaining paper presents it as follows. Section 2 describes the Buddhist tetralemmic dialectics that serve as its framework. Sections 3 –6 define the 16 DMMS domains of the four layers of the model, and section 7 presents the conclusions.

2. The dialectic approach to constructing the DMMS

2.1. Eastern dialectics as a framework of analysis

As mentioned in the Introduction, a research perspective based on a subject-object dichotomy is inconsistent with most self-cultivation traditions and has hindered the development of an ontological model that integrates knowledge from them. As such, this study employs Eastern dialectics, particularly the catuṣkoṭi (literally "four alternatives," colloquially "tetralemma") of subject, object, both subject and object, and neither subject nor object that surpasses the limitations of dualistic and reductionist logic, and the dialecticism of the mutual implication of subject and object, expressed in Chinese by *yin*, *yang*, *taiji*, and *wuji* (the shady, sunny, ultimate, and limitless).

The "naïve dialecticism" (Peng and Nisbett, 1999, p. 744) of acceptance of contradiction is also manifest in the *Bhagavad-Gita*, as noted by Zaehner (1973):

> Arjuna, like most Europeans, thinks in either/or categories: he has not yet realized that Krishna's categories and those of the religion he inherits and further develops are not either/or but both-and. Opposites do not exclude each other but complement each other. (p. 200)

The catuṣkoṭi is a typical Eastern dialectic (Robinson, 1957; Jayatilleke, 1967) that is different from two-valued logic. Nagarjuna provides a typical example:

> All is real, or all is unreal, all is both real and unreal, all is neither unreal nor real; this is the graded teaching of the Buddha. (Siderits and Katsura, 2013, p. 200)

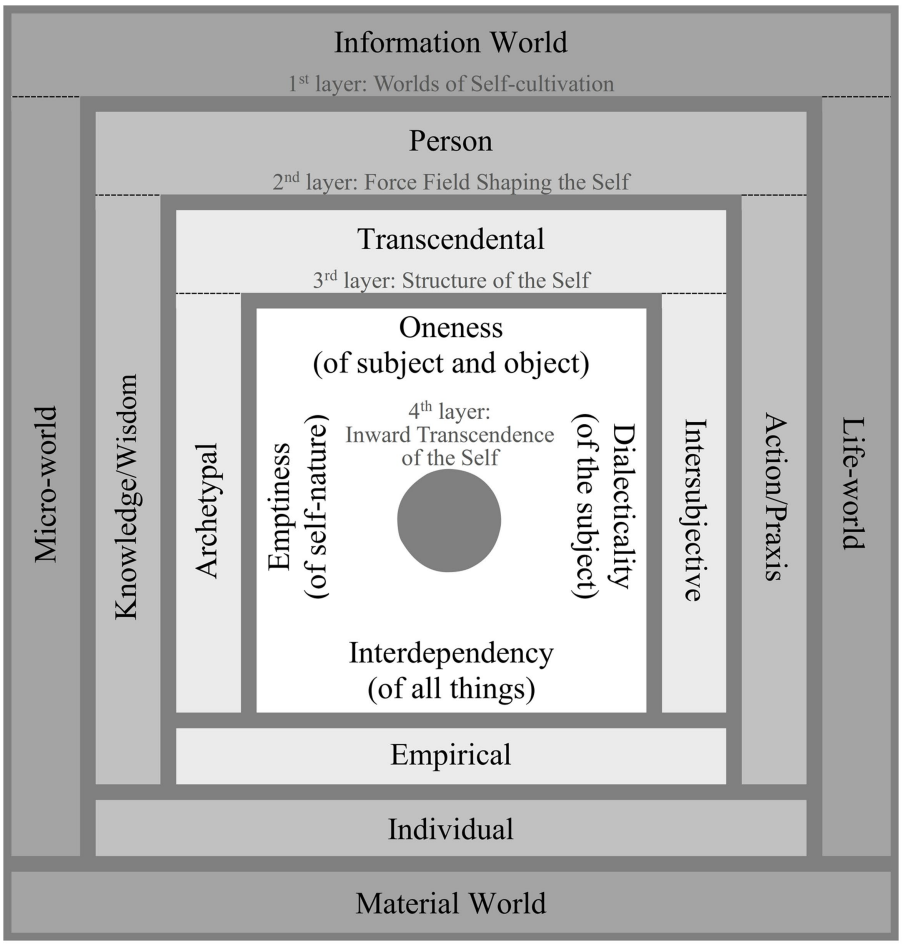

FIGURE 1
The Dialectical Mandala Model of Self-cultivation.

Classical two-valued logic insists that a thing cannot simultaneously have opposite attributes; however, Eastern dialectics disagree. For example, in Eastern dialecticism, "existence" and "nonexistence" do not exhaust all possibilities; "both existence and nonexistence" and "neither existence nor nonexistence" coexist. As Matilal (1986) argues, in Buddhism, existence and nonexistence cannot be interpreted by the classical two-valued logic; the syntax of the Buddhist affirming-negative (Skt. *paryudāsa-pratiṣedha*) differs from classical logic (Verhagen, 1994).

The catuṣkoṭi dialectic helps analyze, complement, and integrate worldviews, especially those from the East. This is why, when Buddhism encountered Taoism in ancient China, the catuṣkoṭi could respond to the four core Taoist concepts of *yin*, *yang*, *taiji*, and *wuji*, thus incorporating into its framework a worldview of the mutual implication of subject and object (Chang, 2018). It is also why the construction of the DMMS employs the catuṣkoṭi as the required cross-cultural framework.

2.2. Visualization of the catuṣkoṭi

In classical logic, P and ¬P constitute a pair of propositions that cannot both be true ("law of contradiction"); however, in a catuṣkoṭi, the first alternative (A) and the second alternative (B) might coexist in a superimposition state (Figure 2).

The right side of Figure 2 demonstrates the law of contradiction. The left side shows that the first and second alternatives in a catuṣkoṭi are reversed; thus, they overlap, and both are true.

The catuṣkoṭi comprises four statements expressing four logical possibilities—something is, is not, both is and is not, and neither is nor is not. These statements encompass the main possible objects of a specific discourse or subject matter. In Figure 2, A is a predicate (or a proposition) first proposed as the first alternative (Skt. *koṭi*) in a catuṣkoṭi to represent a specific domain of discourse. Then, B is the second alternative derived from the antithesis of A. C, as the third alternative ("Both A and B," the overlapping area in Figure 3), represents

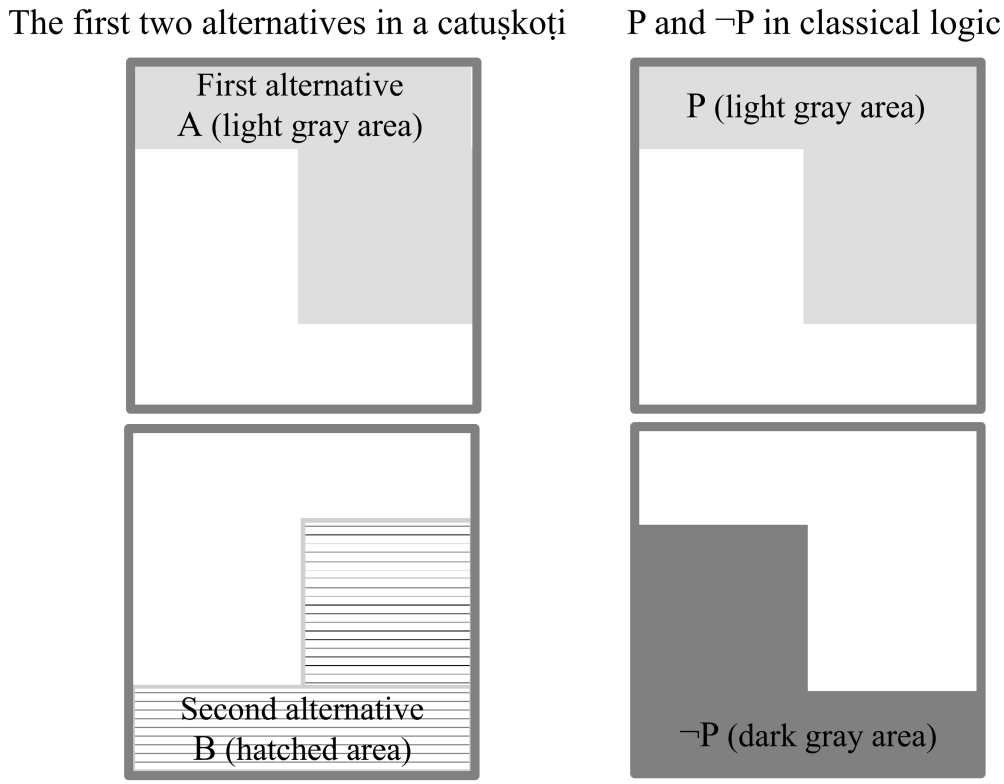

FIGURE 2
Comparison of the first two alternatives (A, B) in a catuṣkoṭi and a contradictory pair of propositions (P and ¬P) in classical logic.

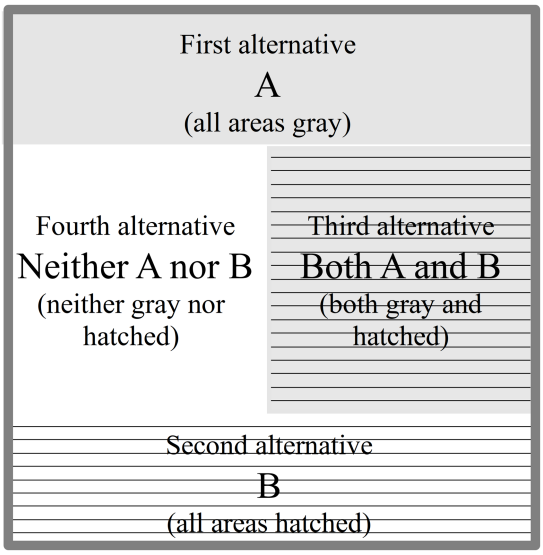

FIGURE 3
The four alternatives of a catuṣkoṭi.

the compound or integrative function of A and B. By contrast, D (the fourth alternative, "Neither A nor B" in Figure 3) means both A's and B's sublation or objectifying awareness.

2.3. Analysis and visualization of the Four-layered Catuṣkoṭi Framework

The Four-layered Catuṣkoṭi Framework proposed by Master Jizang in *Commentary on the Vimalakīrti-nirdeśa-sūtra* (T. 38, p. 913a) can serve as a multilevel framework for analyzing the relevant ontological foundations and epistemological orientations of a complex research topic (Chang, 2018). The dialectical principle and construction method of this analytical framework are as follows. A catuṣkoṭi comprises four alternatives analyzing four representative domains of a specific discourse so that the four alternatives represent all possible domains of this discourse. As the analysis deepens, it extends to a parallel discourse that transcends yet integrates all the previous domains, thus forming a higher-layer catuṣkoṭi in a multi-layered catuṣkoṭi framework. For analyzing a complex topic, four layers of catuṣkoṭi are built to explore different relevant discourses, such as the phenomenal, methodological, epistemological, and ontological discourses (Chang, 2018).

In the case of the DMMS, the first-layer catuṣkoṭi's four domains (A, B, C, and D in Figure 4) represent all the worlds of self-cultivation. In the Taoist worldview, they would correspond to the root metaphors of *yin*, *yang*, *taiji*, and *wuji*: the information world, the material world, the life-world (from which *yin* and

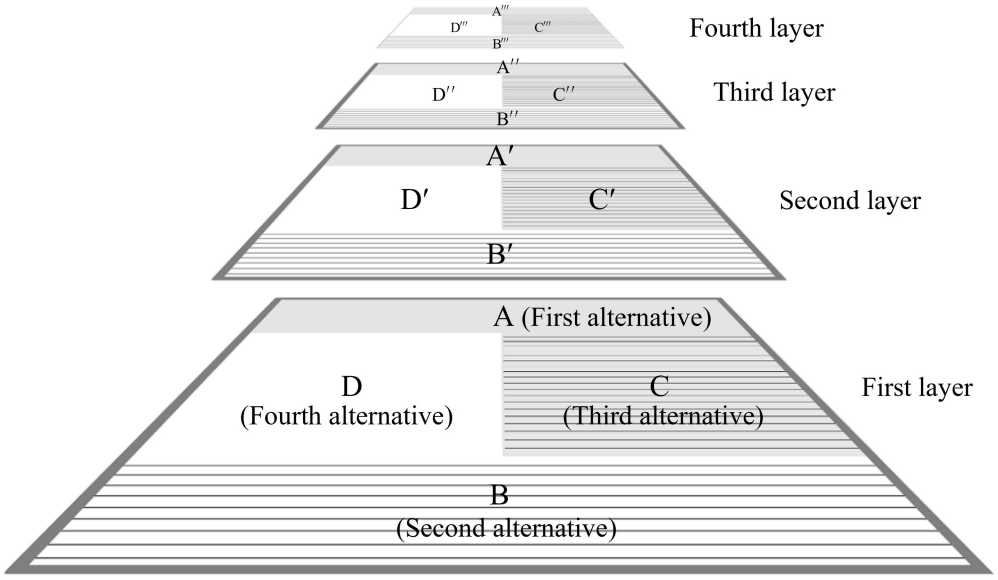

FIGURE 4
The three-dimensional structure of the Four-layered Catuṣkoṭi Framework.

yang originate and to which they return), and the mind world (without the limitation of *yin* and *yang*), respectively. The four worlds can be integrated as a person's integral world consciousness. Therefore, the domain of the person, the first alternative of the second-layer catuṣkoṭi (A′ in Figure 4), is the integrator of the whole first-layer catuṣkoṭi. In other words, after establishing A, B, C, and D in Figure 4, it obtains A′, which integrates all four alternatives of the previous layer. Subsequently, B′, C′, and D′ of the second-layer catuṣkoṭi are dialectically developed from A′. In this manner, the second-layer catuṣkoṭi is dialectically derived from the first-layer catuṣkoṭi. The same method forms the third and fourth layers. Figure 4 shows the complete Four-layered Catuṣkoṭi Framework.

To tabulate the 16 domains of the four layers, the DMMS depicts the top view of Figure 4 with a slight simplification and modification, taking the form of the Buddhist womb mandala (Garbha Maṇḍala), as shown in Figure 5. The first and second alternatives of the first-layer catuṣkoṭi (A and B in Figure 3) are reduced to the upper and lower rectangles (A and B in Figure 5). The third alternative ("Both A and B" in Figure 3) is represented by the rectangle on the right (C in Figure 5) because the second layer overlaps with the center of the first layer. Likewise, the fourth alternative ("Neither A nor B" in Figure 3) is reduced to the left rectangle (D in Figure 5). The same method is used for the second and third layers.

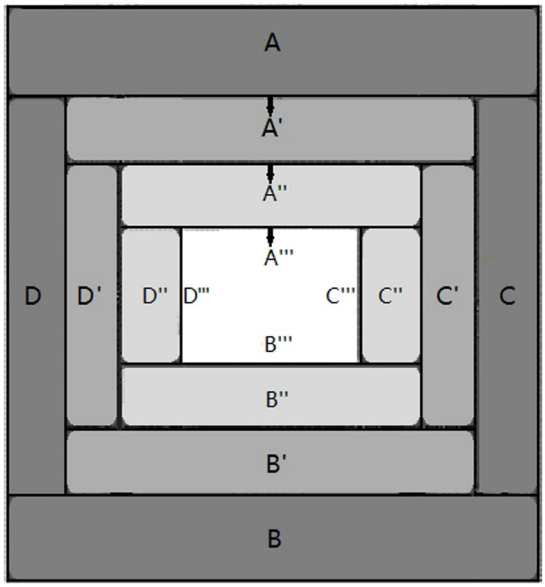

FIGURE 5
Two-dimensional visualization of the Four-layered Catuṣkoṭi Framework.

3. Defining the first DMMS layer: The worlds of self-cultivation

Chinese thinkers tend to discuss the effort of self-cultivation in the context of a body–mind continuum (Huang, 2017). To transcend the subject-object dichotomy, Velmans (2017) proposes reflexive monism, a kind of mind–body monism, and links the theory to Advaita nondualism. He suggests that the body and mind are two aspects of something that is in itself neither mental nor physical, similar to Leibniz's monad. Such mind–body monism has developed in several directions, including different divisions of emergentism (e.g., Searle, 2002; Kauffman, 2008) and panpsychism (e.g., Skrbina, 2005; Seager, 2006). Panpsychism

postulates a protomental nature that forms the substrate of the universe, matter, and consciousness (Griffin, 1997), thus echoing the Eastern concept of self-nature (Skt. *svabhāva*), which refers to the intrinsic nature or essence of beings (Hwang, 2019; Wang and Wang, 2020). As a variant of proto-panpsychism, Pereira's (2013) triple-aspect monism (TAM) further differentiates between the unconscious mental aspect (i.e., the "informational aspect") and the conscious mental aspect (p. 328).

Based on a *yin-yang* model, Chinese cosmology forms an understanding of the *yin* world (*yinjian*; the nether world) in contrast to the *yang* world (*yangjian*; this world). First, the *yin* world is an information world that registers the life experiences of all beings since the beginning of time (Lee and Chang, 2001). The information world is set as the first alternative of the first DMMS catuṣkoṭi. Second, the material world is the second alternative, the antithesis of the information world. Third, *yin* and *yang* together produce everything that constitutes our life-world (the third alternative). Fourth, to face, comprehend, and explain the given world, one constructs the world of comprehension, the micro-world (the fourth alternative). This study maps the first DMMS layer onto the TAM framework (Pereira, 2013), as shown in Figure 6.

The first and second domains of the first DMMS layer map onto TAM's informational and material aspects, respectively. Although the third and fourth domains map onto TAM's conscious aspect, the first DMMS layer does not merely identify consciousness; instead, it determines whether the construction of consciousness is collectively inherited (the third domain) or is original (the fourth domain). It identifies the two constructs of consciousness: (1) the life-world collectively constructed and inherited by people as "beings-in-the-world" (Dreyfus, 1990, p. 40) and (2) the micro-world constructed from one's observation, analysis, and comprehension of the world.

The catuṣkoṭi structure of the four worlds can be figuratively conceived as a stereographic correspondence between the Riemann sphere and the complex plane (also called the Argand plane), as shown in Figure 7. The Riemann sphere, named after Bernhard Riemann (1826–1866), is a mathematical model mapping the extended complex plane. The *Avataṃsaka* master Fa-tsang (643–712) illustrated the doctrine of the manifestation of the Buddha-mind (Skt. *Tathāgatôtpatti-saṃbhava*) using the simile of Indra's net of pearls. All pearls are reflected within each pearl of Indra's net and constitute a monad-universe in which all beings are connected by infinite threads of relationality in nonspace and nontime (Liu, 1982). Fa-tsang's distinction between the Buddha-mind and its manifestation roughly corresponds to Leibniz's distinction between the monad-universe and the perceived universe (Liu, 1982). Indra's net of pearls and the Buddha's third eye are all archetypes of the Buddha-mind, analogically modeled as a monadic sphere to represent the *Avataṃsaka* micro-world. All beings interdependently exist and are essentially equal; they are equally represented as points on a sphere. Each point on the sphere has a tangent plane passing through it, which serves as the base plane of the model, containing the real and imaginary axes that represent the material and information worlds (Lee, 2019), respectively. The stereographic projection onto the plane represents the life-world.

The definitions of the four first-layer DMMS domains are presented in the following subsection.

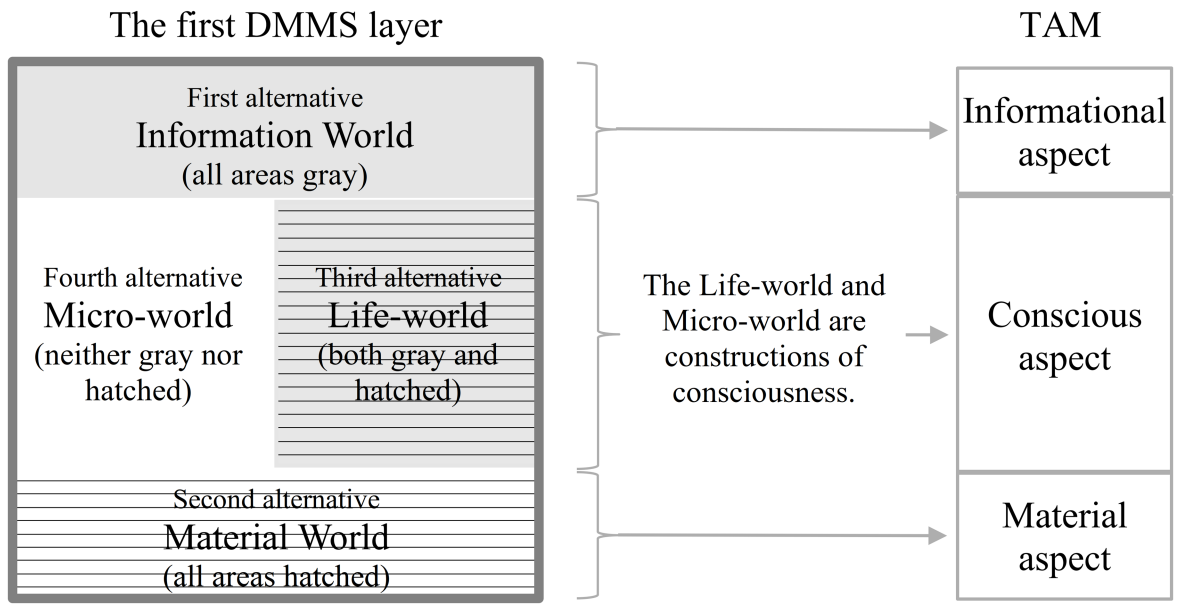

FIGURE 6
The first Dialectical Mandala Model of Self-cultivation (DMMS) layer mapped onto the triple-aspect monism (TAM) framework.

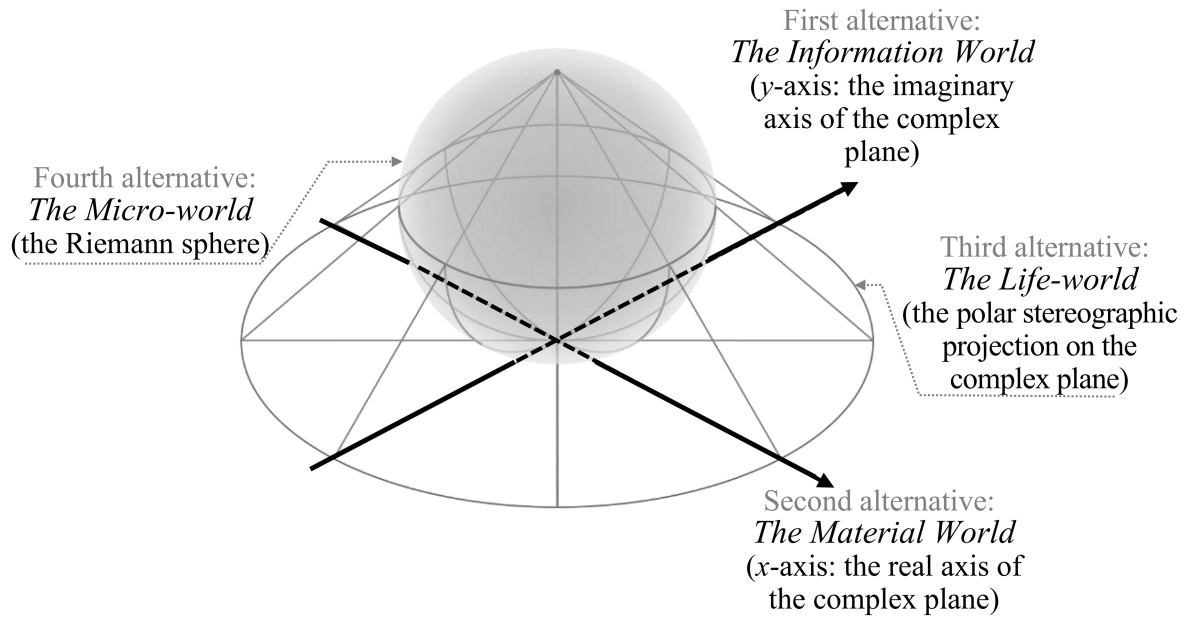

FIGURE 7
The catuṣkoṭi structure of the quadruple worlds.

3.1. The information world

An information pattern is transmittable from one material system to another. In TAM (Pereira, 2013), consciousness "goes away" at the moment of death; however, some of the elementary mental forms continue and are "re-actualized by other individuals" (p. 323). Pereira (2013) calls these transmittable potential mental forms "information" (p. 313). The definitions and explanations of TAM's informational aspect are consistent with modern scientific research and provide a framework to study karma seeds, *saṃsāra*, and causal agents (e.g., deities, spirits, fate, and astrological influences).

Corresponding to the informational aspect in TAM, the information world defined in the DMMS is unconscious. However, mystics and enlightened masters have been meditating since ancient times to gain insight into the unconscious information world. According to Yogācāra Buddhism, all experiences produce karmic seeds (Skt. *bījas*) as impressions, which are stored in *ālaya-vijñāna* (repository consciousness).

3.2. The material world

Eliade (1959) notes that for a person on a spiritual path, "nature is never only 'natural'; it is always fraught with a religious value" (p. 116). Everything in the material world is inherently unstable in its transience but offers an opportunity to realize life as an ego-transcending practice. In the past few decades, some religions (e.g., Tibetan Buddhism) have begun a dialog aimed at integrating natural science and religion. For example, electroencephalographic studies of the effects of different types of meditation help advance our understanding of self-cultivation traditions. The neurobiological approach to self-cultivation uses emerging technologies (e.g., functional magnetic resonance imaging) to measure the physical expressions of spiritual variables, despite criticisms of reductionism (Velmans, 2017).

3.3. The life-world

Husserl's (1970) life-world is a phenomenological concept that refers to "wakeful world-consciousness" and the self-evident world experienced by people (p. 108). Various religions are grounded in an original unity of life-world consciousness that precedes the subject-object dichotomy. Life-world construction comprises unconscious information processing (the first domain) and material mechanisms (the second domain). The information-material duality of the life-world is analogous to the wave-particle duality of quantum consciousness (Di Biase, 2013; Hameroff and Penrose, 2014). Thus, the life-world is identified as the third alternative of the first DMMS catuṣkoṭi.

Life-world construction is based on historical, cultural, and social consciousness. Therefore, it is neither separable from nor reducible to the information world or material world. When studying self-cultivation experiences in religious organizations or societies, we should analyze the life-world domain, such as a religious organization's type of authority (e.g., traditional, charismatic, legal-rational).

3.4. The micro-world

The term "micro-world," introduced by Wallner (1994), originally refers to a functioning scientific construct. However, in the DMMS, its meaning is extended to represent all the mentally constructed realities that everyone consciously forms. The sentiment that "things are not whole," as illustrated in the first of the Ten Oxherding Pictures (the Searching for the Ox), drives people to search for the "lost ox," thereby finding the "ox's trace" (Trungpa, 2001, p. 74). The search of the world for the tracks as a substitute for the actual ox represents the comprehension and theorization of one's experience of life—the construction of the micro-world. Based on the life-world and guided by varying themes for different needs, humans have created various micro-worlds of science, ethics, esthetics, and religion (Hwang, 2006, p. 85); although the absolute reality seems beyond human knowledge, people have constructed various micro-worlds to approximate it. One's beliefs and worldview belong to this domain, and therefore, the result of self-cultivation is associated with one's micro-world consciousness and should be systematically considered in this domain. For example, to understand the conduct of specific ascetics, the researcher should first probe their micro-worlds of belief.

4. Defining the second DMMS layer: The force field shaping the self

The second stage of Zen practice depicted in the Ten Oxherding Pictures is Seeing the Traces, which refers to seeing the "conflicts created by the ego" (Trungpa, 2001, p. 76). Correspondingly, the second layer of the DMMS presents the dialectical force field created by and, in turn, shaping the self, aligning with Hwang's MMS, as shown in Figure 8.

4.1. Person

Hwang (2011) defines "person" as "an agent-in-society who takes a certain standpoint in the social order and plans a series of actions to achieve a particular goal" (p. 65). "Person" is a sociological or cultural concept, and its meaning in a specific culture reveals that culture's values and worldview.

Unlike the Christian view of individual equality, Eastern cultures tend to regard individuals as unequal according to their place in a spiritual hierarchy and the level of self-cultivation they have achieved (Dumont, 1980; Friedman et al., 2010). The Confucian classic *Great Learning* (Chinese: 大學 ; *Da Xue*) states that "from king to ordinary people, everyone must take self-cultivation as the basis of person-making" (Chinese: 自天子以至於庶人壹是皆以修身為本). To understand this concept of person-making, we may refer to Mencius (372–289 BCE), who believed that "[a] person has these four dimensions (propriety, righteousness, integrity, and a sense of shame) just as having four limbs" (Chinese: 人之有是四端也猶其有四體也) (*Mencius-Gong Sun Chou* I: 6). In this sense, a person is a unique individual with a name, history, duties, social roles, hierarchical identity, spiritual development, and worldview. Person-making is essentially about self-cultivation, and a person's being-in-the-world integrates all four worlds of the first DMMS layer. Thus, "person" is the first domain of the second DMMS layer.

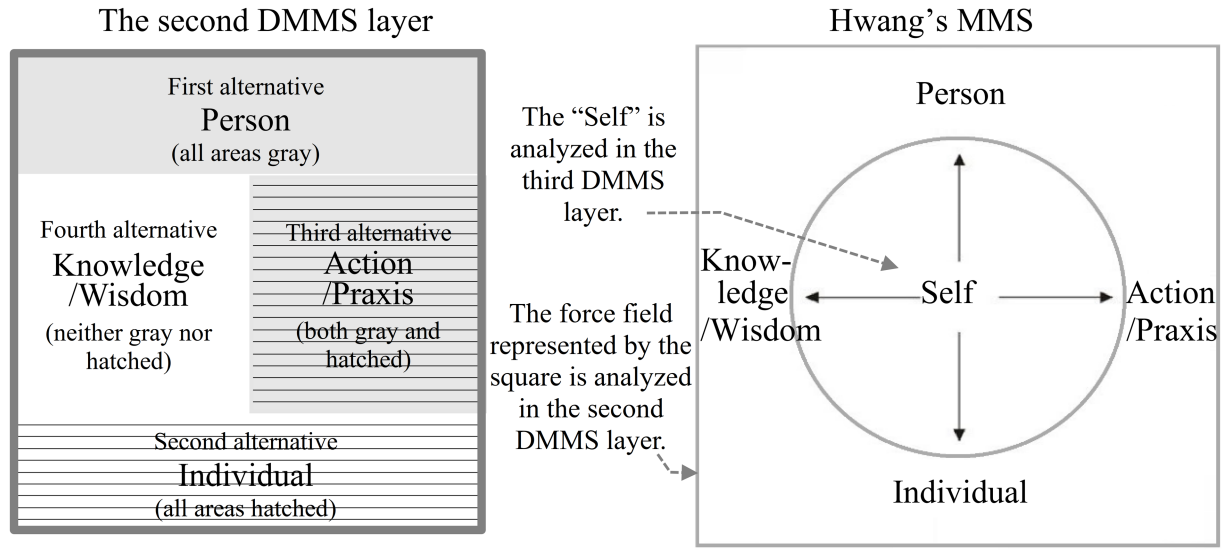

FIGURE 8
The second Dialectical Mandala Model of Self-cultivation (DMMS) layer and Hwang's (2011) Mandala Model of Self (MMS).

4.2. Individual

In the sacred-secular duality of most cultural traditions, the biologically defined "individual" contrasts with the culturally defined person. Thus, the domain of the individual is the second alternative of the second DMMS catuṣkoṭi. An individual, as a biological entity, is driven by various desires (Shiah and Hwang, 2018). Therefore, the egoistic and altruistic variants of hedonistic ethics (including those teaching a pursuit of spiritual bliss or maximizing the pleasure of most people) are rooted in this domain. Contrary to a person's uniqueness, all individuals are equivalent and reduced to anonymous statistical entities in an empirical study.

4.3. Action/praxis

Heidegger calls the activity of existing "being-in-the-world" (Dreyfus, 1990, p. 40). "Being" can be translated as "entity"; however, the word also emphasizes that human existence is a verb rather than a noun. The hyphenation emphasizes the primordial praxis of our existence in the world. People's actions are rooted in biological (the domain of the individual) and cultural (the domain of the person) drives; the praxis as being-in-the-world integrates the individual with the world that the person stands for. Thus, the action/praxis is the third domain, the integrative function between the individual and personal domains. Finally, acts undertaken for self-cultivation, such as fasting, meditation, prayer, worship, and pilgrimage, can unravel and unfold their systematic meaning from this DMMS domain.

4.4. Knowledge/wisdom

Knowledge and beliefs support many human actions undertaken to achieve self-cultivation; the wisdom for action is contained in one's stock of knowledge (Hwang, 2011). According to Piaget's (1997) genetic epistemology, knowledge is neither *a priori* truth, as suggested by idealists, nor determined by sensory experience, as argued by empiricists (p. 19). Thus, knowledge/wisdom belongs to neither the domain of the person (the first alternative of the second DMMS catuṣkoṭi) nor the individual domain (the second alternative). As the fourth domain of the second DMMS layer, the knowledge/wisdom domain corresponds with the domain of action/praxis. Through action/praxis, people acquire and modify knowledge/wisdom, and through knowledge/wisdom, they adopt action/praxis.

5. Defining the third DMMS layer: Structure of the self

The notion of self plays a significant role in self-cultivation traditions. Metzinger's (2006) nihilist view suggests that the self, generated from the brain's message processing system, is phenomenal, has no substance, and does not exist independently of the brain. Vasubandhu explained continuity from one lifetime to the next using the simile of one flame of a fire giving rise to another (*Ātmavādapratiṣedha* 4.3.5–6), thus emphasizing non-self, non-essentialism, and impermanence. However, as Thurman (2005, p. 200) has pointed out, although Buddha proclaimed that an "absolute self" (an independent referent of "I") does not exist, he taught the co-dependent structure of a "relative self."

The Vedānta philosophers conceived the individual self (*jiva*) as a "reflection" or a "limited appearance" of *ātman* (the transcendental and highest self; Deutsch, 1980, p. 54). The concept of *ātman* serves as the first principle in all major schools of Hinduism. Differing from the *ātman* concept, the *anātman* (non-self) concept found in some Yogācāra, Yogācāra-Madhyamaka, and Tathāgatagarbha texts reveals that the core nature of consciousness is non-dual reflexive awareness (MacKenzie, 2012). Thus, Mahāyāna Buddhism grasps consciousness as an ever-present self-luminous awareness without making an ontological commitment to *ātman*. However, both traditions identify two aspects of consciousness, the empirical and the transcendental, and link the inherent reflexivity of consciousness to its transcendental aspect (MacKenzie, 2012).

The dual-aspect analysis is analogous to Immanuel Kant's view of subjectivity, which distinguishes the transcendental subject from the empirical subject. For Kant, the transcendental self is inferred from and serves to unify itself with the existence of the empirical self (Kant, 1787 [1929]). One cannot be conscious of the transcendental self, which is only revealed through Husserl's (1960, p. 37) transcendental-phenomenological *epoché* (suspending assumptions and beliefs). By contrast, the empirical self is what James (1890, pp. 291–298) calls "the self as known" (an objective "me").

The DMMS establishes the dialectical existence of the "relative self" (Thurman, 2005, p. 200) *via* the four alternative domains of the third DMMS catuṣkoṭi. The third DMMS layer is an epistemological analysis that differentiates the transcendental domain (the first alternative of the third DMMS catuṣkoṭi; subject not objectified) from the empirical domain (the second alternative; objectified subject) of consciousness to reflect a subject and object's structure of mutual implication. In the experience of consciousness, the empirical self's role is that of the subject; the transcendental self, functioning within the empirical self, integrates the force field shaping the self (the second DMMS layer) and associates the fragments of the subjective experiences of different time-spaces and roles, thus supporting united self-consciousness. In the intersubjective domain (the third alternative), the transcendental and empirical selves are integrated into real-life consciousness. As the fourth alternative of the catuṣkoṭi, the archetypal domain reflects the principle of how consciousness emerges from the transcendental and empirical selves. The archetypal self refers to an archetype of order and wholeness that organizes and directs all other elements of our psyche (Jung, 1986), identical to neither the empirical nor the transcendental self. These four domains are explained next.

5.1. Transcendental

Since ancient times, people have imagined and pursued a pristine absolute subject that functions as the transcendental unifier of subjective experience. Concepts of the higher self, such as the "unconditioned self," "whole self," and "soul" (Holden, 2007, pp. 13–16), are roughly analogous to Kant's concept of the transcendental self. In fact, notions of the transcendental self vary across traditions. For instance, opposite to fatalism, the innate Buddha-nature (or the Buddha within), proposed by the Buddhist Tathāgatagarbha school as the origin of reflexive awareness and the transcendental handler of karma seeds, exists on the ontological ground of emptiness (Skt. *śūnyatā*). Still, in ontological arguments of Abrahamic religions, the soul is derived from the existence of God, symbolizing the transcendental self whose essence is God. Thus, mystics could represent the transcendental self as a *Deus absconditus*, a hidden God, pointing out the unknowability of the essence of God. Furthermore, Taoists and Confucians meditate on the immortal within, *shen* (Chinese: 神; literally meaning "spirit," "soul," and "deity"), another self that is not shaped by embodied experience and thus belongs to the transcendental domain. Whether called Dharmaraja or Jehovah, an impartial God maintaining the law of karma or the existence and equilibrium of the life-world can symbolize the transcendental self.

The third stage of Zen practice depicted in the Ten Oxherding Pictures is Glimpsing, a self-reflexive glimpse into the non-discriminating and non-conceptual transcendental self. The glimpse makes one ascend the first of the 10 Faith Stages described in the *Jeweled Necklace Sutra* (Chinese: 瓔珞經; T. 24, pp. 1017–1023). The transcendental self as "the universe of possible forms of subjective process" (Husserl, 1960, p. 73) is transpersonal (Assagioli, 1973).

5.2. Empirical

As the self's transcendental domain rises and integrates the force field shaping the self (the second layer of the DMMS), the opposite—the objectified empirical domain of the self—is shaped by the force field. In this domain, self-schema, body awareness, dream ego, fantasy self, and an entire collection of dispositions are all knowable *via* introspection and observation. Accordingly, specific self-cultivation systems, such as the silent-illumination meditation (Chinese: 默照禪; *Mozhao Chan*) of Master Hongzhi (1091–1157), utilize meditation on the impermanence of the empirical self as a way to achieve liberation. The sixth of the Ten Oxherding Pictures, the Riding Home, depicts such meditation (Yamada, 2004).

5.3. Intersubjective

According to Husserl (1970), one's experience of objects in the world is necessarily "intersubjective," which means it is accessible or can be established for two or more subjects (p. 168). Human consciousness comprises intersubjective integration of the empirical self's various modes (e.g., a person's dream egos in different dreams) and of self-awareness and other-awareness. The idea of intersubjectivity describes such constitutional interdependence of human consciousnesses. Based on intersubjectivity, the subjective experiences become integrated, and self-consciousness emerges (Stern, 2002). Intersubjectivity is an integral aspect of the self, and intersubjective consciousness differs from Descartes' notion of consciousness as an independent walled-off sphere wherein resides a pristine self (Stern, 2002).

The "social self" (James, 1890, p. 293) that we present and experience as "I" in society and the "transpersonal identities and subjectivities" (Berlant, 1998, p. 283)—for example, the mystical Tibetan tantric practice of awakening to one's identity as a compassionate bodhisattva—belong to the intersubjective domain of the self. In Mahāyāna Buddhism, the bodhisattva's Nirmānakāya (literally "transformation body"; one of the three bodies of the Buddha) is manifested in response to the deep longing of sentient beings. The fifth of the Ten Oxherding Pictures, the Taming, metaphorically depicts such intersubjective responses. In parallel, *Tao Te Ching*, a fundamental text for Taoism, notes that a sage has no invariable mind of his own but makes people's minds his own (Ch. 49). In specific Taoist rituals, priests perform as spirit mediums for the deceased or deities and comfort believers.

5.4. Archetypal

Jung (1986) describes archetypes as "identical psychic structures common to all" (p. 65). Archetypes have universal forms in the collective unconscious and become the contents of conscious experience in response to specific situations. For instance, during the Taoist Qianwang ("guiding the deceased") ritual, Taoist priests "perceive" clients' relatives who have passed away, converse with the clients as the deceased, and reveal private matters, intentionally or otherwise. Their conversations often outline the *yin* world and its king, Yanluo, resembling the typical descriptions of the nether world and ruler of death in various myths. Archetypes such as Yanluo become factors of psychological empowerment and trigger human potential to become moral, compassionate, and wise. Sometimes, an archetype manifests as a deity to the believer, with specific images and ideas that construct the individual's worldview and define good and evil. However, specific transcendental ideas may lead people into contradictions or antinomies. Therefore, a central concern of many religions is to justify their archetypal ideas.

A great variety of archetypes are described in diverse religions as sacred entities, including various astrological formations, mythological characters, and deities. Thus, psychologists explore archetypes through myths, rituals, art, and people's spiritual experiences. Jung (1986) listed examples of archetypes: mother, father, anima, animus, persona, shadow, and the core

archetype—the archetypal self. The fourth of the Ten Oxherding Pictures, the Catching, depicts the ox herder regaining the lost ox and the temporary equilibrium in the archetypal self. However, the DMMS only dialectically identifies the archetypal self in its third layer (the structure of the self), which still falls short of the ultimate reality. The ultimate reality is symbolized by the top and innermost layer, the inward transcendence of the self.

6. Defining the fourth DMMS layer: Inward transcendence of the self

Fa-tsang defined the "Round Teaching" (complete teaching) in his *Treatise on the Five Teachings*:

> As to the Round Teaching, which is all about the undistorted and holistic nature of everything and the self, the infinite dependent origination, and the unobstructed interpenetration: The one is the many, the many are the one, the subject integrates with the object consummately. (T. 45, p. 485b, ll. 7–9)

The DMMS draws on the Buddhist argument of self-nature being "one, many, both one and many, neither one nor many" (Tillemans, 1984), incorporating round teaching into its fourth layer. It defines the alternatives of the fourth DMMS catuṣkoṭi as follows: the oneness of subject and object (immanent integration of the dialectical structure of the self) as the first alternative of the catuṣkoṭi (the one), the interdependency of all things (transcendent integration between self and other) as the second (the many), the dialecticality of the subject as the third (both the one and the many), and the emptiness of self-nature as the fourth (neither the one nor the many). Accordingly, the DMMS reveals the kernel of self-cultivation on the top layer, termed "inward transcendence of the self," as a means to compare, identify, analyze, and integrate the diverse spiritual advancement in various cultural contexts.

6.1. Oneness (of subject and object)

According to the subject-object dichotomy worldview, the mind cannot perceive things-in-themselves (*noumena*). However, some scientists have begun to perceive the mind as reflecting the same quantum phenomena that make the physical universe possible (Bohm, 1951; Hameroff and Penrose, 2014).

The holistic immanence, the oneness of subject and object, is an ultimate concern in most self-cultivation traditions, particularly Confucianism, Taoism, and Buddhism. According to the Confucian classic *Doctrine of the Mean* (Chinese: 中庸 ; *Zhong Yong*), "complete sincerity" (至誠) assists in "Heaven and Earth's transformation and sustenance" (天地之化育). In other words, a sincere human can merge with the infinite Heaven and Earth.

Similar doctrines describe the oneness of subject and object. The *Avataṃsaka*'s Mind-Only Poem points out the oneness of the mind, the Buddha, and all living beings and reflects the influence of Yogācāra's mind-only (Skt. *citta-mātra*) philosophy that disaffirms the existence of external objects.

> The Buddha is also like the mind, and living beings are like the Buddha. The mind, the buddhas and the living beings—there is no difference between these three. (Mind-Only Poem, T. 9, p. 465c, ll. 28–29)
>
> If one understands that the activity of the mind creates the worlds everywhere, he will see the Buddha, and understand the real nature of the Buddha. (T. 9, p. 466a, ll. 1–2)

In essence, the mystical understanding of the holistic oneness (or mind-only) described above is an advanced stage of self-cultivation in which one's sense of a separate self is abandoned. Since ancient times, "to see one's own originally enlightened mind" (Chinese: 明心) and "to see the self-nature" (Chinese: 見性) have been key to becoming a saint. The seventh of the Ten Oxherding Pictures, the Transcending Other, depicts the ox herder's awareness of oneness.

6.2. Interdependency (of all things)

Antithetical to the one (oneness of subject and object) is the many (interdependency of all things). Through transcendence, one sees the connectedness underlying the diverse elements of nature, that is, the interdependency of all things.

The interdependency of all things has two dimensions. The first one argues that the existence of everything depends on one God, whereas the second dimension asserts that everything is interdependent, as in the Buddhist concept of "dependent origination" (Skt. *pratītya-samutpāda*). In Mahāyāna Buddhism, interdependency does not harbor a subject-object dichotomy worldview. The image of "all Buddha fields contained in one atom" (e.g., T. 10, p. 906c, ll. 25–26), often repeated in the *Avataṃsaka*, led ancient masters to formulate a sophisticated philosophy of interdependency (McMahan, 2002). Thus, the final stage of enlightenment depicted in the Ten Oxherding Pictures is an awakened state of being-in-the-world, akin to "the moon reflecting in a hundred bowls of water" (Trungpa, 2001, p. 92), capable of seeing the Buddha-nature in all beings (Yamada, 2004). Mahāyāna philosophy posits that a lucid insight into self-nature illuminates the interdependency of all beings, which extinguishes the self and conquers death anxiety, thus leading to a state of "nonself-plus-compassion" (Shiah, 2016). Such a keen awareness of interdependency might have been echoed by the quantum mechanical discovery of the interaction between the observer and the observed. However, the observer's role in the collapse of the wave function into discrete particles might be construed as actually affirming the centrality of the self.

6.3. Dialecticality (of the subject)

Hegel's (2010) dialectic, which serves as "the principle of all natural and spiritual life" (p. 35), asserts a conceptual progression toward a teleological end in absolute spirit; thus, the self-estrangement process (self-objectification and alienation) may be part of self-creativity and self-discovery (Vaughan, 2015). There is a similitude between the Hegelian immanent teleology of absolute spirit and the Mahāyāna teleology of the dialectical manifestation of Buddha-nature in that the means (the dialectical process) to the end (absolute spirit or Buddha-nature) is inherent in the end; that is, the unpredictable end is the subject achieving itself in the means (Kim, 1996, p. 66).

As some individuals approach the top of Maslow's (1971) hierarchical model of needs with a strong motive toward alleged self-transcendence, they identify with something more authentic than the purely individual self and engage in a form of self-cultivation, perhaps through transpersonal or mystical experiences (Koltko-Rivera, 2006). Wilber (2007) holds that people's self-consciousness and reality are evolving in an immense "natural hierarchy," an "order of increasing wholeness" (p. 25). Self-cultivation tends to be a dialectical process of moving from one stage of identification with the lower self to a transcendental identification with the transpersonal self. Defined as an integration of the one (the first alternative of the fourth DMMS catuṣkoṭi) and many (the second alternative), the dialecticality of the subject (the third alternative) manifests the integral subjectivity in a dialectical process, such as the process of awakening from seeking the manifested (the many) to realizing the concealed Buddha-nature (the one).

This domain of self-cultivation circumvents monotheism and pantheism, grounding two forms of spiritual practice. In the first, a human being achieves the spirit of transcendence with complete surrender to a transcendent being. In the second, the empirical self inwardly integrates with the transcendental self, as in the "metamorphic transformation" of a person into an immortal like a cicada emerges from its shell (outlined in the Taoist scripture *Seven Bamboo Tablets of the Cloudy Satchel*, as cited in Needham, 1991, p. 141). The penultimate picture of the Ten Oxherding Pictures, the Reaching the Source, depicts how the selves disappear and the Sambhogakaya (retribution body) emerges (Trungpa, 2001). The *Past-and-Present Karma Sutra* (T. 3, pp. 620–653) tells the stories of the Buddha's self-sacrifice out of great compassion (Skt. *mahā-karuṇā*) in past lives and the path of his awakening from prince to bodhisattva and finally to Buddhahood. The essence of great compassion and awakening is the "transformation of the basis of the mind" (Skt. *āśraya-parivrtti*) from the empirical self to transcendental Buddha-nature (Wangchuk, 2007, pp. 235–237), that is, the dialecticality of the subject. Derived from this dialectic, the holistic and dynamic nature of the self-displays compassion and the processes of change.

6.4. Emptiness (of self-nature)

Heidegger (1975) finds that one reaches transcendence by being projected into nothing: "Without the original manifest character of nothingness, there is no selfhood and no freedom" (p. 251). *Explanations of Diagram of the Ultimate* (Chinese: 太極圖說; *Taijitu Shuo*) of Zhou Dunyi (1017–1073) begins by declaring a basic presupposition: "from *wuji* emerges *taiji*." *Wuji* symbolizes the undifferentiated nature of the mind—limitlessness, absoluteness, and nothingness. Correspondingly, the eighth of the Ten Oxherding Pictures unveils the primordial nature of the self by depicting an empty circle (Trungpa, 2001; Yamada, 2004). The Buddhist concept of non-self is based on the emptiness of self-nature (Skt. *svabhāva-śūnyatā*). According to the *Avataṃsaka*, everyone has infinite potential (analogous to the quantum superposition of all possibilities) and plays an active role in what nature manifests. The Buddha illuminates everything past and future in the present moment, demonstrating the emptiness of self-nature (*Avataṃsaka*, T. 9, p. 634a–b). Furthermore, according to the Madhyamaka philosophy, the Middle Way doctrine (comparable to Kant's dialectics), the absolute truth manifests itself in the mutual implication of and sublation between the one and many (Murti and Venkatachala, 2008, p. 36). The Middle Way is based on the emptiness of self-nature, beyond the duality of nothingness and somethingness (Abe, 1985, p. 158). As the *Mahāprajñāpāramitā-sūtra* notes, "the great Bodhisattvas see the reality in everything, and the reality is neither one nor many" (T. 6, p. 676a, ll. 22–23). Thus, the emptiness of self-nature is defined by the fourth alternative of the fourth DMMS catuṣkoṭi, an awareness that there is neither the one (the first alternative) nor the many (the second alternative).

However, the most critical conceptual problem in the DMMS' construction is the inherent incommensurability between different modes of cultivation. The transcendent God is the ultimate concern of pious Christians; by contrast, Mahāyāna Buddhists and Taoists aim to ultimately reveal the mind's self-nature. The dialectical modeling of the DMMS suspends the researcher's judgment and identifies a concept within the structure of its cultural system to reveal its essence, similar to Husserl's transcendental-phenomenological reduction from non-reflective to reflective thinking.

7. Concluding remarks

This paper presents the first dialectical construction of an ontological model of self-cultivation, which frames the terminology in a tetralemmic dialectic that prevents concepts such as *yin*, *yang*, and self-nature from being limited to a subject-object dichotomy worldview. The DMMS unfolds the universal domains of self-cultivation and emphasizes that those cultural system domains dialectally coexist and imply each other. As the first step in Hwang's epistemological strategy, its

construction takes a dialectical approach that strategically regards spiritual development as the expansion or inward transcendence of the self-model to avoid controversy over different hierarchical rankings of spiritual development. Therefore, the DMMS is intended as a cross-cultural framework for further analyzing and integrating specific cultural systems in the second step of the strategy to construct additional culture-specific ontologies.

For example, to evaluate Buddhist practitioners' advances in self-cultivation and help them develop a deeper awareness of their beliefs and paths, culture-specific ontological models can be further constructed by applying the DMMS framework to analyze and integrate the traditional models of self-cultivation in Buddhist classics, such as the Seven Stages of Purification in the *Visuddhimagga*, the Four Levels of Jhāna (meditation) described in the *Jhāna Sutta*, the Nine Levels of Meditation in the *Yogācārabhūmi-Śāstra*, and the Ten Oxherding Pictures in the Zen tradition (cf. Canda and Gomi, 2019), thereby creating subdomains to the DMMS. This study has analyzed each of the Ten Oxherding Pictures, showing how to integrate a traditional model of self-cultivation into the DMMS framework. The first and second pictures correspond to the first and second DMMS layers, respectively. The following four pictures are mapped onto the third layer of this framework, and the final four pictures onto the fourth layer. It is noteworthy that some stages of this traditional model are integrated into the DMMS framework as orderly and horizontally expanded domains in the same layer rather than as vertically ranked layers. Given the traditional model's multiplicity of meanings, this hermeneutic approach is deliberately inclusive, enlightening, and exploratory rather than definitive. A culture-specific model reconstructed in this way is an improvement upon a traditional model, with an ontological commitment to the DMMS, and is more comprehensive and analyzable.

In constructing the DMMS, the catuṣkoṭi is employed to assimilate and integrate concepts and worldviews from various philosophies. It deeply probes different self-cultivation systems' ontologies and merges them into a model to define such abstract concepts as emptiness and a non-self. This paper roughly outlines the Buddhist, Taoist, and Confucianist teachings about self-cultivation as examples to explain the DMMS and demonstrates how we can apply the DMMS to reveal and identify the 16 indispensable domains of a specific self-cultivation system. Concepts used in current scientific practices were considered in the development of the DMMS, and the definitions of the 16 domains are supported by philosophies or scientific theories. Thus, after modeling the ontology of self-cultivation, the related concepts may be scientifically treated.

The construction of the DMMS lends itself to three avenues for further research. First, it offers a broader perspective on spirituality, humanity, and reality than that offered by current mainstream psychological practices, without overemphasizing the self. The DMMS may be used by cultural psychologists as a map to determine whether they have overlooked a research domain. Second, indigenous psychologists could construct culture-inclusive theories based on the culture-specific ontological models created with the DMMS framework. Finally, future research must evaluate, refine, and improve the domain definitions of the DMMS by comparing more culture-specific ontologies of different cultural systems and achieving a fusion of horizons.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Abe, M. (1985). *Zen and Western thought*. Honolulu, HI: University of Hawaii Press.

Archer, M. S. (1995). *Realist social theory: The morphogenetic approach*. New York, NY: Cambridge University Press.

Archer, M. S., and Elder-Vass, D. (2012). Cultural system or norm circles? An exchange. *Eur. J. Soc. Theory* 15, 93–115. doi: 10.1177/1368431011423592

Assagioli, R. (1973). *The conflict between the generations and the psychosynthesis of the human ages. Vol. 31*. New York, NY: Psychosynthesis Research Foundation.

Berlant, L. (1998). Intimacy: a special issue. *Crit. Inq.* 24, 281–288. doi: 10.1086/448875

Bhaskar, R. A. (1975). *A realist theory of science*. London, UK: Verso.

Bhatia, S. (2019). Searching for justice in an unequal world: reframing indigenous psychology as a cultural and political project. *J. Theor. Philos. Psychol.* 39, 107–114. doi: 10.1037/teo0000109

Bohm, D. (1951). *Quantum theory*. New York, NY: Prentice-Hall.

Byrne, B. M., and Watkins, D. (2003). The issue of measurement invariance revisited. *J. Cross Cult. Psychol.* 34, 155–175. doi: 10.1177/0022022102250225

Canda, E. R., and Gomi, S. (2019). Zen philosophy of spiritual development: insights about human development and spiritual diversity for social work education. *J. Relig. Spiritual. Soc. Work Soc. Thought* 38, 43–67. doi: 10.1080/15426432.2018.1520671

Chang, N.-S. (Azanlansh, O.-S. C). (2018). The mandala model of Confucian self-cultivation: a framework for analyzing the mechanisms of dual belief in heaven and spirits within the Chinese funeral tradition. *Indigen. Psychol. Res. Chin. Soc.* 50, 3–58. doi: 10.6254/IPRCS.201812_(50).0001

Ching, J. (2000). *The religious thought of Chu Hsi*. New York, NY: Oxford University Press.

Deutsch, E. (1980). *Advaita Vedanta: A philosophical reconstruction*. Honolulu, HI: University of Hawaii Press.

Di Biase, F. (2013). Quantum information self-organization and consciousness: a holoinformational model of consciousness. *J. Nonlocality* 2, 162–177.

Dreyfus, H. L. (1990). *Being-in-the-world: A commentary on Heidegger's being and time, division I*. Cambridge, MA: MIT Press.

Dumont, L. (1980). *Homo hierarchicus: The caste system and its implications*. Chicago, IL: University of Chicago Press.

Eckel, M. D. (2008). *Bhāviveka and his Buddhist opponents*. Cambridge: Harvard University Press.

Eliade, M. (1959). *The sacred and the profane: The nature of religion*. New York: Harcourt, Brace & World.

Ferrer, J. N. (2011). Participatory spirituality and transpersonal theory: a ten-year retrospective. *J. Transpers. Psychol.* 43, 1–34.

Feyerabend, P. (1981). *Realism, rationalism and scientific method: Philosophical papers*. Cambridge, UK: Cambridge University Press.

Fiske, A. P. (2002). Using individualism and collectivism to compare cultures: Comment on Oyserman et al. (2002). *Psychol. Bull.* 128, 78–88. doi: 10.1037/0033-2909.128.1.78

Fowler, J. W. (1981). *Stages of faith*. New York, NY: Harper & Row.

Friedman, H., Krippner, S., Riebel, L., and Johnson, C. V. (2010). Transpersonal and other models of spiritual development. *Int. J. Transpers. Stud.* 29, 79–94. doi: 10.24972/ijts.2010.29.1.79

Gadamer, H.-G. (2004). *Truth and method*. London: Continuum.

Genkova, P. (2015). Methodical problems in cross cultural studies: equivalence—an overview. *Psychol. Res.* 5, 338–346. doi: 10.17265/2159-5542/2015.05.008

Glebkin, V. (2015). Cognitive style of culture and the problem of cultural-historical cognitive development. *Anthropos* 110, 573–582. doi: 10.5771/0257-9774-2015-2-573

Griffin, D. R. (1997). Panexperientialist physicalism and the mind-body problem. *J. Conscious. Stud.* 4, 248–268.

Hameroff, S., and Penrose, R. (2014). Consciousness in the universe: a review of the 'Orch OR' theory. *Phys. Life Rev.* 11, 39–78. doi: 10.1016/j.plrev.2013.08.002

Hegel, G. W. F. (2010). *The science of logic*. GiovanniG.di (Trans.) New York, NY: Cambridge University Press.

Heidegger, M. (1975). "What is metaphysics?" in *And trans, existentialism from Dostoevsky to Sartre*. ed. W. Kaufmann (New American Library: New York, NY), 242–257.

Hofstede, G. (2011). Dimensionalizing cultures: the Hofstede model in context. *Online Read. Psychol. Cult.* 2, 1–26. doi: 10.9707/2307-0919.1014

Holden, R. (2007). *Happiness now! Timeless wisdom for feeling good: Fast*. London, UK: Hay House Publishers.

Huang, C.-C. (2017). Core conceptions of the theory of self-cultivation in east Asian Confucian philosophy. *Philos. Stud.* 7, 1–14. doi: 10.17265/2159-5313/2017.01.001

Husserl, E. (1960). *Cartesian meditations: An introduction to phenomenology*. The Hague: Martinus-Nijhoff.

Husserl, E. (1970). *The crisis of European sciences and transcendental phenomenology: An introduction to phenomenological philosophy*. CarrD. (Trans.). Evanston, IL: Northwestern University Press.

Hwang, K.-K. (2006). "Constructive realism and Confucian relationalism: an epistemological strategy for the development of indigenous psychology" in *Indigenous and cultural psychology: Understanding people in context*. eds. U. Kim, K.-S. Yang and K.-K. Hwang (New York: Springer Science), 73–107.

Hwang, K.-K. (2011). The mandala model of self. *Psychol. Stud.* 56, 329–334. doi: 10.1007/s12646-011-0110-1

Hwang, K.-K. (2014). Culture-inclusive theories of self and social interaction: the approach of multiple philosophical paradigms. *J. Theory Soc. Behav.* 45, 40–63. doi: 10.1111/jtsb.12050

Hwang, K.-K. (2019). A psychodynamic model of self-nature. *Couns. Psychol. Q.* 32, 285–306. doi: 10.1080/09515070.2018.1553147

Hwang, K.-K., and Chang, J. (2009). Self-cultivation: culturally sensitive psychotherapies in Confucian societies. *Counsel. Psychol.* 37, 1010–1032. doi: 10.1177/0011000009339976

James, W. (1890). *The principles of psychology*. New York, NY: Henry Holt and Company.

Jayatilleke, K. N. (1967). The logic of four alternatives. *Philo. East West* 17, 69–83. doi: 10.2307/1397046

Jung, C. G. (1986). in *Jung: Selected writings*. ed. A. Storr (London, UK: Fontana Press)

Kant, I. (1787). *Kritik der reinen Vernunft, Riga. Critique of Pure Reason* SmithN. K. (trans.), New York, NK: St Martin's Press.

Kauffman, S. A. (2008). *Reinventing the sacred: A new view of science, reason, and religion*. New York, NY: Basic Books.

Kim, B. (1996). Buddhist enlightenment and Hegelian teleology: the dialectic of the means and end of enlightenment. *East. Buddh.* 29, 66–84.

Koltko-Rivera, M. E. (2006). Rediscovering the later version of Maslow's hierarchy of needs: self-transcendence and opportunities for theory, research, and unification. *Rev. Gen. Psychol.* 10, 302–317. doi: 10.1037/1089-2680.10.4.302

Lee, S.-C. (2019). Complex space-time and complex quantum mind—an unified platform to explain the large, medium, and small scaled mysteries of universe and consciousness. *Philos. Stud.* 9, 246–252. doi: 10.17265/2159-5313/2019.05.003

Lee, S.-C., and Chang, L.-S. (Azanlansh, O.-S. C). (2001). The connection model between keywords and information field in finger reading experiments. *Buddh. Sci.* 2, 60–77. doi: 10.30162/BS.200107.0007

Liu, M.-W. (1982). The harmonious universe of fa-tsang and Leibniz: a comparative study. *Philos. East West* 32, 61–76. doi: 10.2307/1398752

MacKenzie, M. (2012). "Luminosity, subjectivity, and temporality: an examination of Buddhist and Advaita views of consciousness" in *Hindu and Buddhist ideas in dialogue: self and no-self*. eds. I. Kuznetsova, J. Ganeri and C. Ram-Prasad (Farnham, UK: Ashgate Publishing). 159–174.

Magid, B. (2012). *Ordinary mind: Exploring the common ground of Zen and psychoanalysis*. New York, NY: Simon & Schuster.

Maslow, A. H. (1971). *The farther reaches of human nature*. New York, NY: The Viking Press.

Matilal, B. K. (1986). *Perception: An essay on classical Indian theories of knowledge*. Oxford: Clarendon Press.

McMahan, D. L. (2002). *Empty vision: Metaphor and visionary imagery in Mahāyāna Buddhism*. London, UK: Routledge.

Metzinger, T. (2006). Reply to Gallagher: different conceptions of embodiment. *Psyche* 12, 1–7.

Murti, T. R., and Venkatachala, J. (2008). *The central philosophy of Buddhism: A study of Mādhyamika system*. New York, NY: Routledge.

Needham, J. (1991). *Science and civilisation in China: History of scientific thought*. New York, NY: Cambridge University Press.

Nisbett, R. E. (2004). *The geography of thought: How Asians and westerners think differently…and why*. New York, NY: Simon & Schuster.

Peng, K., and Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction. *Am. Psychol.* 54, 741–754. doi: 10.1037/0003-066X.54.9.741

Pereira, A. (2013). "Triple-aspect monism: a conceptual framework for the science of human consciousness" in *The unity of mind, brain and world: Current perspectives on a science of consciousness*. eds. A. Pereira Jr. and D. Lehmann (Cambridge, UK: Cambridge University Press), 299–337.

Peters, M. A. (2020). Educational philosophies of self-cultivation: Chinese humanism. *Educ. Philos. Theory* 54, 1720–1726. doi: 10.1080/00131857.2020.1811679

Piaget, J. (1997). *The principles of genetic epistemology* (MaysW., Trans.) London: Routledge & Kegan Paul Ltd.

Robinson, R. H. (1957). Some logical aspects of Nāgārjuna's system. *Philos. East West* 6, 291–308. doi: 10.2307/1397476

Seager, W. (2006). The "intrinsic nature" argument for panpsychism. *J. Conscious. Stud.* 13, 129–145.

Searle, J. R. (2002). *The rediscovery of the mind*. Cambridge: The MIT Press.

Shiah, Y.-J. (2016). From self to nonself: the nonself theory. *Front. Psychol.* 7:124. doi: 10.3389/fpsyg.2016.00124

Shiah, Y.-J., and Hwang, K.-K. (2018). Socialized reflexivity and self-exertion: mandala model of self and its role in mental health. *Asian J. Soc. Psychol.* 22, 47–58. doi: 10.1111/ajsp.12344

Shweder, R. A., Goodnow, J., Hatano, G., LeVine, R. A., Markus, H., and Miller, P. (2006). "The cultural psychology of development: one mind, many mentalities" in *Handbook of child psychology, 1: Theoretical models of human development*. eds. W. Damon and R. M. Lerner (New York, NY: John Wiley & Sons), 716–792.

Siderits, M., and Katsura, S. (2013). *Nāgārjuna's middle way: The Mūlamadhyamakakārikā*. Boston: Wisdom Publications.

Skrbina, D. F. (2005). *Panpsychism in the west*. Cambridge, MA: MIT Press.

Slife, B. D., and Richardson, F. (2008). Problematic ontological underpinnings of positive psychology: a strong relational alternative. *Theory Psychol.* 18, 699–723. doi: 10.1177/0959354308093403

Stein, R. A. (2010). *Rolf Stein's Tibetica antiqua: With additional materials*. Leiden, The Netherlands: Brill.

Stern, S. (2002). The self as a relational structure a dialogue with multiple-self theory. *Psychoanalyt. Dialog.* 12, 693–714. doi: 10.1080/10481881209348701

Tang, Y. (2015). *Confucianism, Buddhism, Daoism, Christianity and Chinese culture*. Heidelberg: Springer.

Thakchoe, S. (2017). "Svātantrika Madhyamaka metaphysics: Bhāvaviveka's conception of reality" in *History of Indian philosophy*. ed. P. Bilimoria (New York, NY: Routledge), 343–350.

Thurman, R. (2005). *The jewel tree of Tibet: The enlightenment engine of Tibetan Buddhism*. New York, NY: Simon and Schuster.

Tillemans, T. J. F. (1984). Two Tibetan tests on the "neither one nor many" argument for Śūnyatā. *J. Indian Philos.* 12, 357–388. doi: 10.1007/BF00196089

Trungpa, C. (2001). *Mudra: Early songs and poems*. Boston: Shambhala.

Vaughan, C. (2015). Derrida's supplement to the Hegelian dialectic of spirit. *Hegel-Jahrbuch* 2015, 341–345. doi: 10.1515/hgjb-2015-0154

Velmans, M. (2017). *Towards a deeper understanding of consciousness: Selected works of max Velmans*. New York, NY: Routledge.

Verhagen, P. C. (1994). *A history of Sanskrit grammatical literature in Tibet*. Vol. *1*, Transmission of the canonical literature. New York: Brill Academic Publishers.

Wallner, F. G. (1994). *Constructive realism: Aspects of a new epistemological movement. Philosophica 11*. Vienna: Wilbelm Braumüller.

Wang, Z. D., and Wang, F. Y. (2020). The Taiji model of self II: developing self models and self-cultivation theories based on the Chinese cultural traditions of Taoism and Buddhism. *Front. Psychol.* 11:540074. doi: 10.3389/fpsyg.2020.540074

Wang, F. Y., Wang, Z. D., and Wang, R. J. (2019). The Taiji model of self. *Front. Psychol.* 10:1443. doi: 10.3389/fpsyg.2019.01443

Wangchuk, D. (2007). *The resolve to become a Buddha: A study of the bodhicitta concept in indo-Tibetan Buddhism*. Tokyo, JP: International Institute for Buddhist Studies.

Wilber, K. (2007). *Integral spirituality: A startling new role for religion in the modern and postmodern world*. Boston: Shambhala.

Xu, J., Chang, N.-S., Hsu, Y.-F., and Shiah, Y.-J. (2022). Comments on previous psychological tai-chi models: Jun-zi self-cultivation model. *Front. Psychol.* 13, 1–7. doi: 10.3389/fpsyg.2022.871274

Yamada, M. (2004). *Lectures on the ten Oxherding pictures*. Honolulu: University of Hawaii Press.

Yü, Y.-S. (2016). *Chinese history and culture: Sixth century B.C.E. to seventeenth century C.E.* New York, NY: Columbia University Press.

Zaehner, R. C. (1973). *The Bhagavad-Gītā*. New York: Oxford University Press.

Zhang, D., and Ryden, E. (2002). *Key concepts in Chinese philosophy*. New Haven: Yale University Press.

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Learning motivations and effort beliefs in Confucian cultural context: A dual-mode theoretical framework of achievement goal

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For decades, results of international academic assessments have shown that students in the Confucian cultural circle performed outstandingly well. However, many studies also showed that East Asian students often experienced high pressure and had low interest in academic learning. The "high achievement but low interest" phenomenon has aroused great interest in psychologists and educators. From the emic perspective of cultural psychology, this theoretical article aims to propose (1) a dual-mode framework of achievement goals to conceptualize the motivation for academic learning and (2) two kinds of effort beliefs (obligation-oriented and improvement-oriented belief about effort) students may develop when pursuing academic achievement in societies influenced by Confucian heritage culture. Moreover, a series of empirical studies based on the framework are presented in this article to show that (1) Chinese students' academic striving is motivated not only by their interest but also by role obligation or virtue of effort, (2) students' effort beliefs could predict their learning emotion and behavioral tendency, and (3) students' effort beliefs could be influenced by their parents' and teachers' effort beliefs. The theoretical and practical implications of the framework are discussed.

KEYWORDS

academic achievements, beliefs about effort, learning virtues, personal goals, role obligation, vertical goals

1. Introduction

Students in societies influenced by Confucian heritage culture (including Taiwan, Japan, South Korea, Hong Kong, and Singapore) have frequently demonstrated academic achievements that outshined their Western counterparts in international assessments such as the Trends in International Mathematics and Science Study (TIMSS) and the Program of International Student Assessment (PISA). However, the results of those assessments also showed that East Asian students tended to have low interest in their academic learning (OECD, 2016, 2019; Mullis et al., 2016a,b, 2020). In a similar vein, previous studies have shown that East Asian students often experienced high pressure from social expectation and had low interest in academic learning (Ang and Huan, 2006; Lin and Huang, 2014; Fwu et al., 2018; Ma et al., 2018; Lee et al., 2020). Paradoxically, some experimental and questionnaire researches found that parents' expectation had positive impact on East Asian learners' academic motivation, involvement and achievement (Iyengar and Lepper, 1999; D'Ailly, 2003; Sheldon et al., 2004; Li, 2012). Consequently, the "high achievement but low interest" phenomenon and learning motivations of East Asian students arouse great interest in cultural and educational psychologists.

Researchers have indicated that mainstream Western motivation theories could not comprehensively explain East Asian people's learning motivation because those theories usually

emphasized the intrinsic motivation, personal autonomy or beliefs about ability (Iyengar and Lepper, 1999; Grant and Dweck, 2001; Elliott and Bempechat, 2002; Ho and Hau, 2008; King and McInerney, 2016). From the emic perspective of cultural psychology, it is crucial to construct culture-inclusive theories to understand non-Western people's learning psychology and behavior *via* cultural meaning systems (Shweder, 2000; Hwang, 2019).

Many East Asian societies are culturally influenced by the Confucian tradition, which has a comprehensive value system emphasizing social roles, effort-making, self-cultivation and academic achievements (Ames, 2011; Hwang, 2012; Li, 2012). In Confucian doctrines, a virtuous person should improve oneself and be in accordance with his/her social roles. If one improves or cultivates one's own self through continuously learning and daily practices, s/he will be regarded as a virtuous person. These cultural values could influence East Asian people's attitudes and behaviors associated with learning (Chen et al., 2009, 2019; Li, 2012; Peterson et al., 2013; Fwu et al., 2017, 2018). Li (2012) indicated that the conception of "learning" (*xué-xí*) in Chinese is virtue-oriented. A "good" student is one who has the qualities of diligence, earnestness, sincerity, perseverance, steadfastness, and endurance of hardship in learning. These characteristics are all synonymous with "effort" and can be referred to as "learning virtues." Previous studies have shown that, among students in Hong Kong, Taiwan and Korea, to study hard and to excel in academic performance were considered to be the primary obligations (Hong, 2001; Fwu et al., 2014). Besides, the duty conceptions were strong predictors for Asian students on academic performance (Peterson et al., 2013).

Institutionally, for over 1,000 years (from about 600 CE to 1905 CE), China implemented an "official examination system" (*kē-jǔ*) to select government officials by national exams. This system assessed scholars on their knowledge of Confucian classics and was regarded as a major method of selecting and promoting talented and virtuous persons to be officials. The system in turn instilled values and doctrines of Confucianism into the minds, habits and practices of the general populace for generations. Studying hard to pass these exams and be admitted as officials was an effective way for commoners to raise their social class. Nowadays, to earn a high level of academic degree is still regarded as a matter of great honor for one's family (Hwang, 2012; Li, 2012).

2. Dual-mode framework of achievement goal

In order to conceptualize the motivations for academic pursuit in societies influenced by Confucian traditions, the author proposed a dual-mode framework of achievement goal (see Table 1), revised from the work of Chen et al. (2009). According to the framework, two modes of achievement goal can be differentiated in Confucian cultural context. The *vertical goals* are socially constructed and characterized by high expectations from significant others, such as parents or teachers. Many of these goals are derived by the general public from a set of highly recognized common values; hence, individuals' performances in the pursuit of these goals will usually be ranked on a vertical ladder of achievements. In order to climb up the "achievement pyramid," one needs to overcome the difficulties and failures of such goals. Those who work hard on vertical goals tend to be motivated by dutifulness or identity of role obligation and be viewed as virtuous persons, while those who do not may be seen as flawed in character. Typically, academic achievements are usually regarded as vertical goals in societies influenced by Confucian heritage culture. Fwu et al. (2014, 2016, 2017) conducted scenario experiments and administered questionnaires to junior high school students as well as their teachers and parents. The results showed that hard-working students who were successful in pursuit of academic goals tended to win more credit from parents and teachers due to their better moral image.

TABLE 1 The dual-mode framework of achievement goal.

	Personal goals	Vertical goals
Primary source of goal-construction	Autonomous interest	Social expectation
Motivation mode	Intrinsic motivation	Dutifulness
Manifestation of virtues	Insignificant	Significant
Functions of psychosocial adaptation	Maintenance of positive self-regard	Identification of role obligations
Self-attribution pattern	Self-enhancement	Effort model
Implicit beliefs	Ability beliefs: Entity or incremental beliefs of ability	Effort beliefs: Obligation-oriented and improvement-oriented beliefs about effort

On the other hand, the *personal* or *non-vertical goals* are constructed by individuals' autonomous interests. Individuals may choose and define the content and criteria for their personal goals from a wide variety of domains. Such goals may not have high social value and are not necessarily subject to consistent expectations from significant others. These goals include personal interests or hobbies with intrinsic motivation. Moreover, those who pursue these goals, irrespective of the degree of effort they make, will not be evaluated from the perspective of moral virtues. Previous studies showed that achievements in the arts or sports, for instance, were typical examples of personal goals in Taiwan (Chen et al., 2009; Fwu et al., 2016).

A series of empirical studies based on the dual-mode framework of achievement goal have been conducted. Chen et al. (2009) adopted the scenario stimulation method in two experimental studies to investigate the attributional patterns of different goals. They argued that motivation theories developed in individualistic cultures often emphasize the positive impact of autonomous interest on well-being in the process of pursuing achievements (see Deci and Ryan, 1985, 2000; Ryan and Deci, 2018). This may apply to the case of achieving personal goals; namely, when people pursuing personal goals in daily life, the main psychosocial function involved is to maintain positive self-regard. Therefore, Chen et al. (2009) hypothesized that, when attributing their success or failure in personal goals, individuals tend to exhibit the self-enhancement pattern, that is, to attribute failure to external factors and success to internal factors.

For pursuing vertical goals, however, the main psychosocial function is to form social identities by fulfilling one's role obligations with highly social expectations. Because it is so important to achieve vertical goals, one cannot afford to allow uncontrollable factors—such as innate ability, luck, or task difficulty—to be the determining ones. People are likely to emphasize effort as a way to prompt oneself and to make more effort for future success, especially in the case of failure. Thus, Chen et al. (2009) hypothesized that individuals tend to adopt the self-enhancement pattern or "effort model," that is, to attribute their failure to lack of effort. The scenario stimulation method was adopted in two experimental studies. The results showed that, in pursuit of

vertical goals such as academic achievements, Taiwanese undergraduates indeed tended to attribute their failure to lack of effort. Nonetheless, in pursuit of personal goals (e.g., participating singing competitions), they tended to attribute success to ability and failure to luck or task difficulty.

Furthermore, according to the dual-mode framework, students' academic striving is motivated not only by their academic interest but also by identity of role obligation. In order to investigate the hypothesis, Chen and Wei (2013) developed scales to measure 176 collage students' academic interest, role identity, learning satisfaction and academic engagement. The results showed that students' role identity could directly predict their academic engagement. However, the effect of their academic interest on academic engagement was indirect and mediated by learning satisfaction. Huang et al. (2015) adopted the same scales to measure 1,132 undergraduates' role identity, intrinsic motivation and learning engagements in learning foreign languages. The results showed that students' role identity was positively correlated with their learning engagements in the classroom, whereas intrinsic motivation was positively correlated with learning engagements outside the classroom.

3. Effort beliefs towards academic learning in Confucian culture

According to the dual-mode framework of achievement goal, when pursuing vertical goals, people tend to believe that it is one's duty to exert oneself and that effort-making is the crucial way to improve one's performance. In other words, pursuing academic achievements is often regarded as student's role obligation. Thus, when pursuing academic achievements, students may develop two kinds of beliefs about effort (Chen et al., 2016, 2019; Wang and Chen, 2020). One is the obligation-oriented belief about effort (OBE) which is to believe that making effort in learning is a student's role obligation. The other is the improvement-oriented belief about effort (IBE) which is to believe that effort can conquer one's limitations and improve one's academic performance. To put it differently, if one believes that it's a duty to exert her-or himself (OBE), effort-making is regarded as a moral virtue or purpose. On the other hand, if one believes that making effort is the crucial way to improve performance (IBE), effort-making is regarded as a method or means of achieving goals.

Since it's important to hold OBE and IBE for achieving academic goals, it's possible that these effort beliefs may predict students' learning emotion and striving behaviors. In order to investigate the predictive effects of effort beliefs on academic learning, Chen et al. (2016, 2019) developed an Effort Beliefs Scale to measure people's OBE and IBE. In one study, 475 undergraduates were asked to report their feelings and behaviors after a real-life event of academic failure (Chen et al., 2019). The results of structural equation models showed that both OBE and IBE could predict the "feeling of indebtedness" after academic failure. The feeling or sense of indebtedness (*kuì jiù*) is a feeling of failure with respect to one's responsibilities or obligations. If one fails to uphold one's role obligations, s/he may experience a feeling of indebtedness to others. Feeling of indebtedness is a common emotion with psychosocial function for East Asians (Markus and Kitayama, 1991; Bedford and Hwang, 2003; Chiu, 2011; Kang and Larson, 2014). In the same vein, Fwu et al. (2018) found that students who regarded the pursuit of vertical goals as fulfilling role obligations felt indebted toward their parents and themselves after reflecting upon their academic failure. To get rid of feelings of indebtedness, students tended to motivate themselves to work harder to achieve academic success.

Furthermore, the results of Chen et al. (2019) showed that only OBE could predict students' striving behaviors after academic failure. It's worth to note that, in that study, the researchers also measured participants' implicit belief of ability, a construal purposed by Dweck (2006) and Dweck and Leggett (1988). According to Dweck's model, when students experience failure, those who hold the entity belief of intelligence or ability may feel helplessness and avoid studying harder. In contrast, those who hold the incremental belief of ability may work hard to learn and face the challenge of failure. However, the results of Chen et al. (2019) showed that the implicit belief of ability was correlated with neither participants' striving behaviors nor their feelings of indebtedness after their poor learning. Since most studies of Dweck's model were conducted in Western cultures, whether the model could be generalized to East Asian societies is an issue (Grant and Dweck, 2001). Besides, though Dweck's dichotomous model takes account of one's incremental belief about ability, it does not take cognizance of the cultural values among East Asian societies, nor does it identify the psychological construal of obligation-oriented belief about effort.

In addition, it's possible that individuals develop their effort beliefs through socialization process of family or school. Li (2012) analyzed over 200 recordings of Taiwanese and American mothers talking with their children about learning. The results of content analysis showed that Taiwanese mothers talked most about effort, diligence, and concentration, especially when the topic was the children's poor learning. However, American mothers and children talked mostly about mental abilities and a positive affect toward learning. Therefore, Wang and Chen (2020) hypothesized that children's effort beliefs could be influenced by their parents. The Effort Belief Scale was adopted to measure 266 pairs of parents and children in Taiwan. The results of structural equation models and mediating analyses showed that elementary school children's effort beliefs could be predicted by their parents' effort beliefs. Moreover, Wang and Chen found that, similar to the result of Chen et al. (2019), only children's OBE could predict their learning engagements in school.

In order to investigate the relationships between teachers' effort beliefs and their teaching attitudes, Chen et al. (2016) measured 151 high school teachers' effort beliefs and their attitudes toward students. The results showed that teachers' OBE could positively predict their favoritism, praises, and future expectations of struggling students, but negatively predict their favoritism and praises of smart students. Besides, teachers' IBE could negatively predict their expectations of smart students and favoritism of struggling students, but positively predict their praises of smart students. In sum, the values and beliefs about effort in pursuing vertical goals such as academic achievements could be transmitted from generation to generation *via* the socialization of family and school.

4. Discussion

The main purposes of this article is to propose a dual-mode theoretical framework of achievement goal and construes of effort beliefs to understand students' learning motivations in Confucian cultural context. There are some theoretical contributions of the framework. Firstly, we argue that Chinese students' striving for learning is motivated not only by academic interest but also by role obligation or virtue of effort. Secondly, when pursuing vertical goals such as academic achievements, individuals are likely to develop obligation-oriented and improvement-oriented beliefs about effort. These beliefs about effort

may predict students' learning emotions and engagements. Thirdly, these effort beliefs may be transmitted from parents and teachers. Moreover, in this article, a series of empirical studies based on the theoretical framework are presented, and the results of those studies support the framework.

All in all, from the perspective of emic approach of cultural psychology (Shweder, 2000; Hwang, 2019), we argue that the meaning system of Confucian heritage culture is crucial for the understanding of learners' motivation among East Asian societies. Future studies can further investigate various characteristics of vertical or personal goals. Researchers can also explore the social and cultural antecedents of effort beliefs as well as the cognitive, affective and behavioral consequences of these beliefs on academic pursuits.

It is important to note that, because vertical and personal goals are conceptual types, it is not our intention to categorize all goals in real-life situations into two poles of a dichotomy. Although Confucianism places high emphasis on the obligations inherent in people's social roles, it also recognizes the importance of personal agency and rational reflection (Ames, 2011; Hwang, 2012; Chan, 2014). In many East Asian societies, maintenance of autonomous self and identification with social roles are often regarded as two sides of one coin in the cultural scripts for an ideal personhood and living a meaningful life (Doi, 1986).

For practical implications, if a student would like to integrate intrinsic and extrinsic motivations in academic learning, s/he can attain the goals set by others and try to develop autonomous interest concurrently, or gradually transform vertical goals into personal ones (Carver and Scheier, 2000). However, though students who are not good at academics and still obligate to work hard may fulfill their role obligations, a continuous struggle without improved outcomes may also cause strong frustrations and negative emotions (Fwu et al., 2017). Thus, it is a critical issue for educators to find a remedy to ease the negative impacts while retaining the positive effects of effort beliefs on learning motivation in societies influenced by Confucian heritage culture.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Ames, R. T. (2011). *Confucian Role Ethics: A Vocabulary*. Hong Kong: Chinese University Press.

Ang, R. P., and Huan, V. S. (2006). Academic expectations stress inventory: development, factor analysis, reliability and validity. *Educ. Psychol. Meas.* 66, 522–539. doi: 10.1177/0013164405282461

Bedford, O., and Hwang, K.-K. (2003). Guilt and shame in Chinese culture: a cross-cultural framework from the perspective of morality and identity. *J. Theory Soc. Behav.* 33, 127–144. doi: 10.1111/1468-5914.00210

Carver, C. S., and Scheier, M. F. (2000). Autonomy and self-regulation. *Psychol. Inq.* 11, 284–291.

Chan, J. (2014). *Confucian Perfectionism: A political Philosophy for Modern Times*. Princeton: Princeton University Press.

Chen, S.-W., Fwu, B.-J., Wei, C.-F., and Wang, H.-H. (2016). High-school teachers' beliefs about effort and their attitudes toward struggling and smart students in a Confucian society. *Front. Psychol.* 7:1366. doi: 10.3389/fpsyg.2016.01366

Chen, S.-W., Fwu, B.-J., Wei, C.-F., and Wang, H.-H. (2019). "Effort beliefs count: the predictive effects of effort beliefs on students' emotion, attribution, and behavior toward academic failure in a Confucian cultural context" in *Asian Education Miracles: In Search of Sociocultural and Psychological Explanations*. eds. G. A. D. Liem and S. H. Tan (London: Routledge), 207–221.

Chen, S.-W., Wang, H.-H., Wei, C.-F., Fwu, B.-J., and Hwang, K.-K. (2009). Taiwanese students' self-attributions for two types of achievement goals. *J. Soc. Psychol.* 149, 179–194. doi: 10.3200/SOCP.149.2.179-194

Chen, S.-W., and Wei, C.-Y. (2013). A two-factor model of learning motivation for Chinese undergraduates: on the function of academic identity and role identity. *Chin. J. Psychol.* 55, 41–55. doi: 10.6129/CJP.20120717

Chiu, L. T. (2011). The Impact of Expectation Sources on Indebtedness. [Dissertation/Master's Thesis]. Taoyuan, Taiwan: Chung Yuan Christian University.

D'Ailly, H. (2003). Children's autonomy and perceived control in learning: a model of motivation and achievement in Taiwan. *J. Educ. Psychol.* 95, 84–96. doi: 10.1037/0022-0663.95.1.84

Deci, E. L., and Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York, NY: Springer.

Deci, E. L., and Ryan, R. M. (2000). The what and why of goal pursuits: human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268. doi: 10.1207/S15327965PLI1104_01

Doi, T. (1986). *The Anatomy of Self: The Individual Versus Society*. Tokyo: Kodansha International.

Dweck, C. S. (2006). *Mindset: The New Psychology of Success*. New York: Ballantine Books.

Dweck, C. S., and Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychol. Rev.* 95, 256–273. doi: 10.1037/0033-295X.95.2.256

Elliott, J. G., and Bempechat, J. (2002). The culture and contexts of achievement motivation. *New Dir. Child Adolesc. Dev.* 2002, 7–26. doi: 10.1002/cd.41

Fwu, B.-J., Chen, S.-W., Wei, C.-F., and Wang, H.-H. (2018). I believe; therefore, I work harder: the significance of reflective thinking on effort-making in academic failure in a Confucian-heritage cultural context. *Think. Skills Creat.* 30, 19–30. doi: 10.1016/j.tsc.2018.01.004

Fwu, B.-J., Wang, H.-H., Chen, S.-W., and Wei, C.-F. (2016). "Effort counts and goals matter: the effects of effort and achievement goals on moral image, approval, and disapproval in a Chinese cultural context" in *Psychology of Asian Learners: A Festschrift in Honor of David Watkins*. eds. R. B. King and A. B. I. Bernardo (Singapore: Springer), 337–353.

Fwu, B.-J., Wang, H.-H., Chen, S.-W., and Wei, C.-F. (2017). 'Feeling bad' or 'being bad?' The trapping effect of effort in academic failure in a Confucian cultural context. *Educ. Psychol.* 37, 506–519. doi: 10.1080/01443410.2016.1152355

Fwu, B.-J., Wei, C.-F., Chen, S.-W., and Wang, H.-H. (2014). Effort counts: the moral significance of effort in the patterns of credit assignment on math learning in the Confucian cultural context. *Int. J. Educ. Dev.* 39, 157–162. doi: 10.1016/j.ijedudev.2014.07.010

Grant, H., and Dweck, C. S. (2001). "Cross cultural response to failure: considering outcome attributions with different goals" in *Student Motivation: The Culture and Context of Learning*. eds. F. Salili, C. Chiu and Y. Y. Hong (New York, NY: Plenum Press), 203–219.

Ho, I. T., and Hau, K. T. (2008). Academic achievement in the Chinese context: the role of goals, strategies, and effort. *Int. J. Psychol.* 43, 892–897. doi: 10.1080/00207590701836323

Hong, Y.-Y. (2001). "Chinese students' and teachers' inferences of effort and ability" in *Student Motivation: The Culture and Context of Learning*. eds. F. Salili, C. Chiu and Y.-Y. Hong (New York, NY: Plenum Press), 105–120.

Huang, H.-T., Hsu, C. C., and Chen, S.-W. (2015). Identification with social role obligations, possible selves, and L2 motivation in foreign language learning. *System* 51, 28–38. doi: 10.1016/j.system.2015.03.003

Hwang, K.-K. (2012). *Foundation of Chinese Psychology: Confucian Social Relations*. New York, NY: Springer.

Hwang, K.-K. (2019). *Culture-Inclusive Theories: An Epistemological Strategy*. Cambridge: Cambridge University Press.

Iyengar, S. S., and Lepper, M. R. (1999). Rethinking the value of choice: a cultural perspective on intrinsic motivation. *J. Pers. Soc. Psychol.* 76, 349–366. doi: 10.1037/0022-3514.76.3.349

Kang, H., and Larson, R. W. (2014). Sense of indebtedness toward parents: Korean American emerging adults' narratives of parental sacrifice. *J. Adolesc. Res.* 29, 561–581. doi: 10.1177/0743558414528979

King, R. B., and McInerney, D. M. (2016). "Culture and motivation: the road travelled and the way ahead" in *Handbook of Motivation at School*. eds. K. R. Wentzel and D. B. Miele. *2nd* ed (New York: Routledge), 275–299.

Lee, M. J., Kim, G., Lee, J., Vo, N. H., and Lee, S. M. (2020). The effects of academic stress and academic failure tolerance on academic burnout among college students: moderated mediation effects of interpersonal stress. *J. Korea Converg. Soc*. 11, 175–185.

Li, J. (2012). *Cultural Foundations of Learning: East and West*. Cambridge: Cambridge University Press.

Lin, S.-H., and Huang, Y.-C. (2014). Life stress and academic burnout. *Act. Learn. High. Educ*. 15, 77–90. doi: 10.1177/1469787413514651

Ma, Y., Siu, A., and Tse, W. S. (2018). The role of high parental expectations in adolescents' academic performance and depression in Hong Kong. *J. Fam. Issues* 39, 2505–2522. doi: 10.1177/0192513X18755194

Markus, H. R., and Kitayama, S. (1991). Culture and the self: implications for cognition, emotion, and motivation. *Psychol. Rev.* 98, 224–253. doi: 10.1037/0033-295X.98.2.224

Mullis, I. V. S., Martin, M. O., Foy, P., and Hooper, M. (2016a). TIMSS 2015 International Results in Mathematics. Boston College, TIMSS & PIRLS International Study Center. Available at: http://timssandpirls.bc.edu/timss2015/international-results/wp-content/uploads/filebase/full%20pdfs/T15-International-Results-in-Mathematics.pdf (Accessed September 24, 2022).

Mullis, I. V. S., Martin, M. O., Foy, P., and Hooper, M. (2016b). TIMSS 2015 International Results in Science. Boston College, TIMSS & PIRLS International Study Center. Available at: http://timssandpirls.bc.edu/timss2015/international-results/wp-content/uploads/filebase/full%20pdfs/T15-International-Results-in-Science.pdf (Accessed September 24, 2022).

Mullis, I. V. S., Martin, M. O., Foy, P., Kelly, D. L., and Fishbein, B. (2020). TIMSS 2019 International Results in Mathematics and Science. Available at: https://timssandpirls.bc.edu/timss2019/international-results/ (Accessed September 24, 2022).

OECD (2016). *PISA 2015 Results: Excellence and Equity in Education. vol. I*. Paris: PISA, OECD Publishing.

OECD (2019). *PISA 2018 Assessment and Analytical Framework*. PISA, OECD Publishing, Paris.

Peterson, E. R., Brown, G. T. L., and Hamilton, R. J. (2013). Cultural differences in tertiary students' conceptions of learning as a duty and student achievement. *Int. J. Quant. Res. Educ.* 1, 167–181. doi: 10.1504/IJQRE.2013.056462

Ryan, R. M., and Deci, E. L. (2018). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. New York, NY: Guilford Publishing.

Sheldon, K. M., Elliot, A. J., Ryan, R. M., and Chirkov, V. I. (2004). Self-concordance and subjective well-being in four cultures. *J. Cross-Cult. Psychol.* 35, 209–223. doi: 10.1177/0022022103262245

Shweder, R. A. (2000). The psychology of practice and the practice of the three psychologies. *Asian J. Soc. Psychol.* 3, 207–222. doi: 10.1111/1467-839X.00065

Wang, K.-H., and Chen, S.-W. (2020). The predictive effects of parents' beliefs about effort on their children's learning engagement: two mediated models. *Indig. Psychol. Res. Chin. Soc.* 54, 63–111. doi: 10.6254/IPRCS.202012_(54).0002

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Homeland, emotions, and identity: Constructing the place attachment of young overseas Chinese relatives in the returned Vietnam-Chinese community

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Little attention has been paid to the place attachment and homeland construction for refugees and their descendants in China. This study investigates the process by which the place attachment of Young Overseas Chinese Relatives is shaped in the context of resettlement sites. This qualitative research employed ethnographic fieldwork, and the author collected local literature and materials from February to December 2019 through participatory observation, in-depth interviews, and questionnaires. It is believed that the construction of a new homeland in the community, the emotional experience of the Young in childhood, and the cultural logic of place attachment shape place attachment. The process by which place attachment is shaped is interwoven with homeland construction, which indicates that the living state and mentality of the Young are becoming increasingly stable. The Young developed different mentalities on the basis of traditional Confucian culture in responding to the socio-cultural environments. The resettlement site has become a homeland to which young persons are solidly attached, people give this site meanings and experience certain emotions regarding it, which generates place identity and begins the process of homeland construction.

KEYWORDS

young overseas Chinese relatives, place attachment, qualitative analysis, daily life, cultural system approach, Confucian cultural system

Introduction

Home is an exemplary kind of place where people feel a sense of attachment and rootedness. Home, more than anywhere else, is seen as a center of meaning and field of care (Cresswell, 2014). Generally, people are attached to their homelands. When people invest their emotions in their homeland but are forcibly driven out of those lands by external forces, the parties' resting emotions may be complex. In 1978 the Vietnamese authority deliberately allowed its Chinese citizens to leave the country because of the deteriorating relations between Vietnam and China (Lam, 2000). Many more overseas Chinese fled to China, they were mainly from northern Viet Nam, where they had lived for decades, and they were mostly fishermen, artisans and peasants (Cutts, 2000). Since that time, many refugees from Indochina have flocked to Southeast Asia as well as other countries and regions, thus leading to an international disaster during the twentieth century.

The Chinese Government assisted the refugees upon their arrival; later, they were officially recognized as refugees and resettled to six southern provinces in China (Song, 2014). China subsequently established a project to settle the refugees (Cutts, 2000). It has been more than 40 years

since these persons returned to China. Initially, these locations were merely resettlement sites, but they have become a homeland, and resettlement sites have become a vital location for exploring place attachment.

Place attachment is the core concept of place theory; therefore, many researchers believe that place attachment emphasizes the emotional connection between people and places. Humanistic geographers argue that a bond with a meaningful space, or sense of place is a universal affective tie that fulfills fundamental human needs (Scannell and Gifford, 2010). Tuan (1990) uses the term 'topophilia' to refer to place attachment, the word "topophilia" is a neologism, useful in that it can be defined broadly to include all of the human being's affective ties with the material environment. More permanent and less easy to express are feelings that one has toward a place because it is home, the locus of memories, and the means of gaining a livelihood.

For many individuals, childhood place experience plays an essential role in adult identity (Cobb, 1977; Marcus, 1992). Morgan (2010) found that place attachment over the entire human life span found that feelings of connection or belonging to a place increased as people aged and that place attachments formed in childhood were more robust than those formed later in life. Strong bonds to place are only possible when individuals remain in their place of origin for the duration of childhood. This finding reflects a widespread agreement in the literature that the foundations of place attachment are laid down in middle childhood. Robert Hay (1998) found that the development of a rooted sense of place was most influenced by the following factors: length of residence, being born and/or raised in the place, having family and/or close friends living in the place, owning your own home there and being involved in the community. Some studies proposed that the long-term experience of an individual of the physical and social aspects of a place (Ramkissoon et al., 2018; Ramkissoon, 2020), such as biology, environment, psychology, and sociocultural context of the place, develops their place attachment (Shang and Luo, 2021). As introduced above, researchers generally regard emotional factors as an essential connotation of place attachment, and place experience in childhood can affect place identity in adulthood. However, few studies have been able to consult any systematic research concerning the ways in which childhood place experiences shape place attachment.

This study explores the influencing factors and construction process associated with the place attachment of Young Overseas Chinese Relatives in terms of three aspects: childhood local memory, daily life, and emotional experience of young persons. This research can help us understand the lifestyles and psychological states of the Young in such a situation and contributes to the exploration of the cultural adaptation mechanism employed by these individuals. At the practical level, this research is conducive to clarifying the true attitudes and emotions of young persons regarding each resettlement site and subsequently predicting their home-building actions in the resettlement site, which has practical significance for promoting interaction between the resettlement site and local society.

Research objects and methods

Selection of research subjects

For our study, we selected Young Overseas Chinese Relatives in Ganba Community, Ganzhuang Sub-district, Yuanjiang, Yunnan Province (formerly Ganba Branch of Ganzhuang Returned Overseas Chinese' farms). The ancestral home is in Fangchenggang, Guangxi Zhuang autonomous region. In this study, Young Overseas Chinese Relatives (hereinafter, the Young) refer to persons within the scope of children, brothers, sisters, and grandchildren of returned overseas Chinese, who generally live in the resettlement site. During our field investigation, we found that the oldest person born at the resettlement site was 41 years old. Therefore, this study focused on the ages 18–41 years. By the end of 2018, the total number of returned overseas Chinese and their relatives was 2,441. Among them, there are 820 Young Overseas Chinese Relatives, 425 males and 395 females.

From returned overseas Chinese' perspective, as they were expelled by the Vietnamese authorities, their painstakingly managed homes (Vietnamese residences) were destroyed. After returning to China, they were relocated to various farms reserved for returned overseas Chinese, and they faced the practical problems of rebuilding new homes. When returned overseas Chinese came to the resettlement site, the relationship between the people and the place changed significantly. Ganba was incorporated into the Returned Overseas Chinese farms' system from the previous people's commune. The critical impact was that the local spatial pattern, ethnic composition, and livelihoods changed. The reality of the homeland and this series of changes and tribulations have made the resettlement sites an essential research field for investigating the place attachment of returned overseas Chinese and their relatives.

The shaping of place attachment is inseparable from the accumulation of daily life, especially the returning immigrant groups. Only when they use the resettlement site as their new homeland will strong place attachment arise. The construction process of the place attachment of the Young is closely intertwined with the process of the new homeland. By discussing their place attachment, the future development trend of the new homeland can be clarified. The choice of the Young is mainly based on the notice by the Overseas Chinese Affairs Office of the State Council Issuing the Provisions on Defining the Identities of Overseas Chinese, Chinese of Foreign Nationalities, Returned Overseas Chinese, and Relatives of Overseas Chinese [No.5 (2009) of the Overseas Chinese Affairs Office of the State Council].

Field investigation

Phenomenology, hermeneutics, and critical theory have been employed in place research, but only two are considered in-depth here: psychometrics1 and phenomenology (Patterson and Williams, 2005). Williams and Vaske's (2003) place attachment scale is one of the first validated scales to systematically identify and measure meanings over a variety of land use settings. It is based on the place attachment constructs of place identity and place dependence (Brown and Raymond, 2007). The strength of place attachment is predicted by certain social and demographic factors, one of which is owning one's home. People who own their own homes have invested in their local areas, making it likely that they will live there in the long term, which is also a predictor of place attachment and place identity (Anton and Lawrence, 2014).

Although quantitative research can reveal the importance and emotional intensity of different groups of people in relation to "place," it is difficult to answer the question, "What is the meaning of a place to people." This qualitative research employed ethnographic fieldwork, it is worth mentioning that, little attention has been paid to the place attachment and homeland construction for refugees and their descendants in China. Despite their important role in building their homeland as well as in community development, their voices are less

often heard. The study of place attachment is inseparable from investigating the geographical, cultural, and political environments in which a research object is located. Ethnographic fieldwork, provides profound insights into the role of emotion in social life (Beatty, 2014). The basic idea of ethnographic fieldwork is to give an outline of the social constitution, and disentangle the laws and regularities of cultural phenomena from the irrelevances. One of the key components of the fieldwork is gathering specific data from a variety of facts (Malinowski, 1992). Adheres the holistic view of cultural anthropology, and focuses on the interconnections and interdependence of all aspects of the human experience in all places and times—both biological and cultural, past and present (Haviland et al., 2010).

The authors synthesized three data collection methods and adopted an ethnographic writing style. To analyze the influencing factors and construction process of the place attachment of the Young, the author collected local literature and materials from February to December 2019 through participatory observation, in-depth interviews, and questionnaires:

1. Participant observation is the foundation of cultural anthropology. It produces the kind of experiential knowledge and produces effective, positivistic knowledge, participant observation turns fieldworkers into instruments of data collection and data analysis. During the field investigation, we participated in the daily life of young overseas Chinese relatives. First, we made a more detailed description of the life rhythm, habitual behavior, and daily work of the Young. We gained insight into their lives by harvesting mangoes with them, eating together, and walking together, all of which are described in our interview materials. For example, we got these memories and emotional experiences of young persons' childhood through face-to-face conversations and observation. On the other hand, we participated in festivals and major ceremonies during the year, and conducted relevant interviews. Where it was necessary to record the ceremonial process, video recordings were made after obtaining the consent of the parties, so as to collect qualitative data. This method made it possible to track the emergence of these attitudes and behaviors and to tie them to likely causes.
2. In-depth interviews provided valid data on the emotional experience of the Young and the cultural logic of the place attachment. In particular, the emotional experience of fear and attachment to the resettlement site in their childhood. Some findings reported in this essay are based on 30 in-depth interviews with youth. Respondents were selected based on prior knowledge and snowball sampling techniques to ensure that these interviews were representative and comprehensive. Participants were from three villages, all born in Ganba resettlement site. The length of time participants lived at Ganba resettlement site ranged from 18 to 41 years ($M = 29.5$ years), 19 males and 11 females. Data collection ceased after 30 interviews when no new themes were developing from the data, indicating that data saturation had been achieved (Guest et al., 2006). This is an appropriate sample size for thematic analysis which anticipates a minimum of 6–10 participants (Braun and Clarke, 2013).
3. Questionnaires are similar to structured interviews, it is that each respondent has to hear exactly the same question. We use the questionnaire method as a complement to in-depth interviews to help clarify potentially ambiguous items. The findings reported in this essay are based on 30 semi-structured interviews with residents of the two regions. Interviewees were selected on the basis of prior knowledge and through a snowball sampling technique that aimed to ensure diverse representation. We refer to Boğaç's questionnaire, the questionnaire consists of four open-ended questions designed to probe the general characteristics of Young Overseas Chinese' attachment to their homeland. The questions included:

> "Are you happy with your house? (Why)."
>
> "Can you call this place 'homeland'?"
>
> "Does the resettlement site meet your needs?"
>
> "Where would you like to live in the future? (Why?)"

Constructing place: The spatial basis for the place attachment of the young

The process by which place attachment is constructed is closely related to the notion of "placemaking." Especially with respect to the immigrant group of returned overseas Chinese individuals from Vietnam, the Ganba resettlement site was initially an unfamiliar space. These individuals did not establish any social relations or emotional connections in this location. However, after the returned overseas Chinese individuals had lived in the resettlement site for more than 40 years, the most significant factor in the relationship between the people and the place is that the Ganba resettlement site has changed from an unfamiliar space to a new homeland for these returned overseas Chinese individuals. The Young were born and raised at the resettlement site, and they thus experienced the process by which the resettlement site was developed into a new homeland.

From the perspective of place theory, the process of new homeland construction belongs to place construction, just as Lefebvre (1991) said: it is the process of the daily life of new production relations and social relations, the most fundamental of which is around livelihoods. A series of production and consumption activities are carried out, which guarantees the local material basis and constitutes the basis of social relations. This means that the construction of material space is significant in redefining and dividing space in the global political economy, which involves the impact of social, political, and economic factors on people's usual geographical environment.

The construction of the new homeland for returned overseas Chinese is directly related to the government's resettlement policy and administrative management. China's policy to Indochinese refugees is the result of Vietnam's anti-China and Chinese exclusion action and China's accommodation of the refugees (Zheng, 2015). The government's basic guidelines were: to settle in rural areas instead of cities; to allow large clusters; and to assign employment in accordance with skill and experience (Lam, 2000). The farm is a place that is constantly constructed under the state's leadership through the relationship between the people and the place generated by resettlement, production

policies, farm administration, and spatial planning. Especially, the policy of "centralized resettlement is the mainstay, and decentralized resettlement is supplemented" makes returned overseas Chinese generally resettled in various returned overseas Chinese farms.

In 1978, the Ganba resettlement site was first established as the Ganba branch of the Ganzhuang farm for returned overseas Chinese individuals. At that time, there were two sources of resettlement funding: the Chinese government and relevant international organizations. The Chinese government has since allocated more than 100 million yuan to the reception and resettlement of such individuals in Yunnan Province. The government constructed houses, reclaimed land, purchased cattle, horses, and other large livestock, provided tools for production and daily life to returned overseas Chinese, and solved the emerging cultural, educational, medical, and health problems.

In the early days, when returned overseas Chinese were resettled on their farms, the farm was responsible for production and construction. In Returned Overseas Chinese farms, production and living are relatively concentrated. The farm allocates land and other production materials in a uniform manner. After adapting to the local natural conditions, the farm has formulated a business policy of "food self-sufficiency and the vigorous development of sugar cane." Anyone who can work can become a farmer. Initially, the land cultivated by each employee was allocated by the production team to which they belonged. Employees were not allowed to decide freely which crops to plant on cultivated land. They were required to grow sugar cane and supply their crops to the sugar factory associated with the farm.

Returned overseas Chinese choose to live on these farms, which means that their livelihoods are directly intervened by the farms. Their economic income mainly comes from sugarcane cultivation. The stability and convergence of their livelihoods have laid a material foundation for the farm to become a new homeland. Since then, the farm has gradually developed into a community that can meet the production and living needs of returned overseas Chinese, and their lives are guaranteed. In 1985, the contract responsibility system was implemented on the farm, and the farm set the standard of "220 days for men and 200 days for women," and if the workers failed to meet the required working hours, they were treated as temporary workers. By 2000, the Ganzhuang Returned Overseas Chinese farm began to change its original plan and control of the state-owned agricultural and forestry farm and established a management system suitable for the market economy. After comprehensive market conditions and actual local conditions, they chose to replace sugarcane planting with mango planting.

For more than 40 years, returned overseas Chinese and their relatives who took root on the resettlement site gradually developed commonality in terms of economic income and psychological quality, and the site became their new homeland, which created place attachment for the Young, making development possible. As witnesses to the construction of the homeland of the returnees, some Yi people state this:

> I think in the past, the returned overseas Chinese were not as industrious as Yi people, they used to take a teapot and drink tea when they worked, as if they were going to play in the field, and they went home early to rest after working for two or three hours. But in the past few years, they have started to work hard, and they have invested much money in mango planting. In the past, the returned overseas Chinese did not decorate their resettlement houses much, much less intend to build new houses, and probably live here temporarily. In the past few years, new houses have been built, and they have opened a lot of restaurants and stores, which means they are going to settle down here.

The shaping of the place attachment of the young in the daily life of childhood

People's perception of place is inseparable from "lifeworld," Seamon (2000) believes that the lifeworld refers to the tacit context, tenor, and pace of daily life to which normally people give no reflective attention. One significant dimension of the lifeworld is the human experience of place, which continues to be a major focus of phenomenological work in environment-behavior research. The phenomenologists call for a return to the everyday lifeworld of lived experience (Dovey, 1985) and a move away from the objectification of place and its meaning (Million, 1992).

Complex and diverse emotional relationships emerge between people and places in daily life. Faced with various places, people tend to exhibit different emotional experiences. In particular, there are two kinds of emotional experiences that primarily occur in the interaction between young persons and resettlement site during childhood: the emotional experience of fear and the emotional experience of place attachment.

Emotional experience: The transition from fear to attachment

Initially, when the returned overseas Chinese individuals began to live at the resettlement site, they faced an unfamiliar geographical environment and thus had an emotional experience of fear. This emotional experience is closely related to the rumors encountered by the Young as well as to their cultural logic. Belief in the existence of ghosts led to a sense of insecurity, and the returned overseas Chinese individuals passed this information to the children, which in turn caused the children to have frightening emotional experiences.

When the returned overseas Chinese individuals were initially resettled in this location, there was a clinic in the area. These individuals believed that the clinic was a place where people could be treated and saved. It was inevitable that some people would bleed, suffer and die during the process of treatment. One young man recalled this situation as follows: "When I was a child, our parents often told us not to go out to play after dark. According to my father, a long time ago, there was a clinic here, and those who fought, the injured people were treated in the clinic. If they died accidentally, they would be buried nearby. Parents were worried that our children would see unclean things, so they did not let us play around." Therefore, young persons felt that the area where the clinic was located was unclean and might be inhabited by ghosts.

In addition, these individuals also reported fearful emotional experiences pertaining to ponds and reservoirs, which they believed might contain water-related ghosts waiting for people to drown. Their parents rarely let children play alone by the pond to prevent drowning. Such information is widely disseminated in the resettlement site. One of the results is that there is fear in the childhood spatial memories of the Young. A 38-year man recalled:

> When we were young, our parents didn't let us go too far alone. We usually only played near home, and we were afraid when we went far. We only dared to go to the ditch not far from home to play because we were familiar with it, but when we went to the ditch to play, we had to bring a group of children to feel safe.

Returned overseas Chinese and their relatives overcome the fear of living on the resettlement site and gain a sense of security through the use of cultural practices such as folk beliefs and ancestor worship. During the field investigation, we discovered the following cultural practices:

First, the worship of Huagong and Huamu is a typical cultural practice. To returned overseas Chinese, Huagong and Huamu are gods who protect the healthy growth of children. Generally, children do not need to enshrine Huagong and Huamu if they are healthy and safe. Only when a child is often sick or crying at night do parents ask the local master to view the Bazi (Eight Characters of Birth) and give the child a nickname. Generally, a shrine is placed in the room where the child sleeps. If the child cries in the middle of the night in the future, the parents will come to the shrine to burn incense, praying to Huagong and Huamu to take care of the child. It is worth mentioning that the cultural connotations and ritual behaviors of the folk beliefs of the Huagong and Huapo are closely related to the ancestral home (Guangxi Zhuang autonomous region) of returned overseas Chinese (especially in the Fangchenggang city), which means that they overcome fears by actively using the cultural traditions from the ancestral home of Guangxi.

Second, soul-calling is another cultural practice that aims to cause children who are frightened and who have lost their souls to return to normalcy. If a child turns pale and becomes fidgety after having been frightened, parents may attribute these phenomena to the child's loss of soul. When calling the soul, the ceremony host carries the child's clothes in his left hand alongside a bowl of rice and an incense stick in his right hand and then travels to the place where the child's soul was lost. Subsequently, he throws the rice around and shouts "our child, come back." The child, who is present, says "back in the body, back in the body." The child is then asked to put the clothes on their bodies. The next day, the child returns to normal.

Third, seeking the blessing of ancestors. Returned overseas Chinese have a strong sense of ancestor worship. When they encounter disasters, they seek the blessing of their ancestors. A 19-year-old man said:

> When I was in middle school, I had a good friend. One day he drowned while swimming in a pool. One night after his death, I saw him in a dream. I was invited to go swimming, but the horror was that I saw a female ghost floating around him. I felt my soul was gradually separated from my body. At this point, an older man with white light appeared beside me. The older man slowly pushed my soul back into my body; then, I woke up with a start. The next day, I told my grandfather about this dream. My grandfather said that it might be my great-grandfather who came to protect me; so, my grandfather taught me to burn incense in front of the ancestral tablet and pray to my ancestors. Blessed, I haven't had any similar dreams since then.

Culture-inclusive theories for Confucian morphostasis can be effectively used to explain the behavior of returned overseas Chinese. Hwang (2015b) constructed a series of culture-inclusive theories to integrate findings of previous empirical researches, and conflict resolution in Confucian society. Hwang (2012) indicated clearly that ancestor worship ceremonies in folk society also display the earnest Chinese desire for balance with the supernatural. Under the influence of traditional Confucian culture, returned overseas Chinese and their relatives have developed the Confucian mentality. They often utilize means from traditional Confucian culture to deal with problems in their daily lives, and overcome the fear of living on the resettlement site and gain a sense of security through the use of cultural practices such as ancestor worship and folk beliefs.

It should be mentioned that the emotional experience of fear is not the most common experience of the Young in their childhood. Still, these experiences illustrate people gradually adapting to the resettlement site. The emotional experience of fear gradually weakens as the overseas Chinese adapt to the resettlement site's environment and cultural practice and finally only stays in people's collective memory. With the accumulation of time living at the resettlement site, the Young develop new emotional experiences. These experiences are closely related to place attachment and are accumulated and shaped over time.

Happiness and attachment: Daily life of the young in childhood

The daily life experiences of the Young influence the construction of place attachment, and it is gradually constructed in daily life. Place attachment is also shaped during childhood. The process of the Young constructing place attachment has its characteristics, this study sought to understand the emotional attachment of the Young to a place in their daily life. According to the field investigation, place attachment gradually forms in daily life during childhood and the constant interaction with the resettlement site's natural and cultural environments. This means that people's place attachment is established in childhood, and strong place attachment is likely to develop when a person lives in one place for an extended period in childhood.

Happiness is a positive experience that young persons encounter during childhood. They become immersed in their interaction with the resettlement site by playing games in this location. One 38-year-old woman recalled this experience as follows: "When I was a child, I liked to go to the mountains to catch birds and fish in the pond. In spring, I went to the fields to pick wildflowers, and in autumn, I went to the mountains to pick wild fruits. When the sugar cane was ripe, I would ask my friends to play in the field." It can be seen from this interview that the places in which these individuals played during their childhood are closely related to nature and that they feel a unique sense of place in such an environment. Chawla (1992) believes that children are attached to a place when they show happiness at being in it and regret or distress at leaving it, and when they value it not only for the satisfaction of physical needs but for its intrinsic qualities. In this study, the Young obtained survival skills and a sense of security during their childhood, and they experienced positive emotions such as happiness at the resettlement site.

Generally, place attachment involves people's expectations and satisfaction with place stability, producing rich local knowledge of the place and behaviors that help maintain or strengthen attachment, thereby enhancing their sense of place—a positive emotional experience. Year-round, these individuals receive gifts from the resettlement site: in spring, when the kapok trees are in full bloom, they follow their parents to pick up the kapok scattered on the ground. In their early years, when they migrated from Vietnam to the resettlement site, they were unfamiliar with the use of kapok and regarded it as worthless. After time passed, they mastered the art of eating kapok, and kapok became a delicacy. On the eve of the Spring Festival, they traveled to the mountains to pick wild phrynium capitatum and engaged in Zongzi worship of their ancestors; in late autumn, when olives ripened, they visited the hills to pick wild olives with their parents and ate olives with chili peppers. The evidence presented thus far supports the idea that these gifts mainly come from the natural environment of the resettlement site, indicating that they have produced a series of local knowledge, which in turn strengthens their emotional attachment.

Bao Yidi: The cultural logic of the place attachment of the young

The place attachment and identity of young persons are positively related to their understanding of the resettlement site as their homeland. Since they were born and raised at the resettlement site, this place naturally became their homeland. This understanding comes from the cultural logic of Bao Yidi (namely afterbirth). Bao Yidi has a special treatment and cultural connotation for these people. Returned overseas Chinese individuals once had a custom of burying the afterbirth in their houses or in the mountains. Bao Yidi refers to the place where the afterbirth will be buried. This place is where one was born and grew up, and this place has naturally become an emotional homeland. Bao Yidi is an essential criterion for judging whether a place is their homeland and has become a cultural symbol that condenses emotions.

There is the challenge of the discontinuities between pre-and post-migration identities, as well as between the first and second generations. These discontinuities create the experience of watching one's children grow up with a different sense of place and homeland, and become culturally competent in new environments, even in childhood, often surpassing their parents (Ewing, 2005). The object of place attachment for elders is mainly the place of residence in Vietnam, however, Vietnam is an unfamiliar place for young people. The young follow their elders to visit their relatives in Vietnam, and in the homes of their relatives in Vietnam, they are curious about Vietnam's local customs. As discussed by this 19-year-old male informant:

> The climate in Vietnam is hot and humid, and I was very uncomfortable with it when I first got there. They sit on the floor and eat, and I think they may eat more. They have to shake hands with each other before eating, and I don't know why they do that. The older relatives speak our Hakka Chinese, but young people only speak Vietnamese. When I was chatting with Vietnam's cousin, I needed the help of translation software.

"The resettlement site of Ganba Community is my hometown" is the emotional expression of the Young in reference to Ganba. The opinion of a 20-year-old man is typical:

> The household registration is already here, which shows that our roots are already here. I don't regard Vietnam as my homeland because my roots are here in Ganba Community. According to my grandfather, Vietnam used to be chaotic, so my family moved back from there. Vietnam is a place where I have relatives and a scenic spot, but I have never been to Vietnam. I have only been to Guangxi Zhuang autonomous region. When I go to Guangxi, I feel like going to relatives' houses because my relatives in Guangxi speak the same vernacular and I feel cordial.

These words show that when the Young define their Bao Yidi, they often compare their ancestral home in Guangxi, their parents' residence in Vietnam, and the resettlement site of Ganba. They define their homeland based on where they were born and raised and look at their world based on that place. The resettlement site has become the center and foothold of the Young moving in space, even if they leave the resettlement site for work, study, or other reasons, they generally want to return to the resettlement site. A 30-year-old man described the work plan in the Guangdong province thus:

> By the fruit harvest season this year, I will sell the mangoes and then graft new mango varieties, and I will work in the Guangdong province. I hope that after three years, I can make some money and return to Ganba Community. The previously grafted mango varieties should have already set fruit, and I can concentrate on managing mangoes at home, and I don't plan to go out.

A 20-year-old male described his planning in this way:

> Ganba resettlement site is my Bao Yidi, and I plan to live here with my family for the rest of my life. There are many jobs I can do here to support my family. In the past few years, I have been engaged in motorcycle maintenance, but this is just a temporary work for me because I have to cultivate the field at least half of the year. I plan to do more temporary work, so that if the mango income decreases in a certain year, then I can still do a part-time job so that the income will be more guaranteed, and we can live better here.

The ultimate goal of the work plan is to make money in other places and then return to the resettlement site so that the family can live a better life. Such plans are precisely the operation of the cultural logic of Bao Yidi.

"I am from Yuanjiang": The interactive influence of identity and attachment

According to Proshansky (1978), place identity is a sub-structure of the self-identity of the person consisting of broadly conceived, cognitions about the physical world in which the individual lives. These cognitions relate to the variety and complexity of physical settings that define the day-to-day existence of every human being. At the core of such physical environment-related cognitions is the environmental past of the person; a past consisting of places, spaces and their properties which have served instrumentally in the satisfaction of the person's biological, psychological, social, and cultural needs. As Wullenkord et al. (2020) put it: Place identity refers more strongly to the cognitive-emotional bond to a place. In this study, the place identity of young persons is closely related to the fact that they regard the resettlement site as an extension of themselves, and "I am from Yuanjiang" has become a way of expressing their place identity.

In contrast, although the elders have lived at the Ganba resettlement site for more than 40 years, they do not identify as natives of Yuanjiang emotionally. One reason is that their Bao Yidi is not a resettlement site; therefore, they call the Yi people and Dai people living around the resettlement site "natives" and call themselves "returned overseas Chinese." Compared with the elders, during the fieldwork, we observed that Young Overseas Chinese Relatives have developed a unique perception of the resettlement sites, most notably that they believe the resettlement sites have their own "character." When we conducted fieldwork in the resettlement sites, Young Overseas Chinese Relatives often said to us, "Have you noticed? Each village has its character." We present a few representative interviews below:

A 20-year woman recalled:

> Each village has its character, and our village is not as quiet as other villages, and even a small thing will be talked about for two months. For example, yesterday before I got up, my neighbors were already sitting in front of my house chatting. Afterwards, I learned it was about a young man who bought a car.

A 24-year man recalled:

> Very few people in our village drink alcohol, unlike the people in the other two villages, the Young in the other villages often gather together. But the young people in our village are different, we rarely get together.

A 30-year man recalled:

> Each village has its character, and our villagers do not work as hard as other villages. Many young people do not go to work and play games at home all day. In recent years, more and more people are doing business, but the elders often reject our young people. In recent years, young people in other villages have started doing business, but our elders often deny our ideas. They want us to continue growing mangoes instead of doing other work.

From the above interviews, it is clear that the young tended to give an impression of the three settlements, but these impressions were not significant differences between the settlements. The main reason for this phenomenon can be attributed to the cultural logic of Bao Yidi. It is also the tendency of the Young to assign a specific "character" to the three settlements and thus to subdivide them. Hwang (2012) believes that in order to view a person as an agent-in-society, the ways in which the individual follows a certain moral order, takes action, or reacts to others' actions in systems of social relationships should be investigated. Under the influence of the cultural logic of Bao Yidi, the Ganba resettlement site has become the deepest object of place attachment for young persons, which in turn prompts them to develop a place identity to Yuanjiang County.

The concept of mindsponge was first developed by Quan-Hoang Vuong and Nancy K. Napier in early research articles about acculturation and global mindset (Vuong et al., 2022). Coined by Vuong and Napier (2015), the term mindsponge mechanism describes how an individual absorbs and integrates new cultural values into one's own set of core values. Overall, the mechanism centers on five components: the mindset, comfort zone, multi-filtering system, cultural and ideological setting, and cultural values (Jin and Wang, 2022). The Young acquire the ability to perceive the world from the Confucian cultural tradition and cope with the issue of place identity. This is a personal need to construct a place identity, because when they mention that "the resettlement sites have their character," they only compare the three settlements, but not the Yi villages adjacent to the settlements. The fact that the Young have established place identity with the settlement site indicates that the Confucian idea of *the Superior Man loves people as people and cares about creatures* (仁民而愛物) plays a role in the process of homeland construction, that is, the Young see the settlement site not only as a geographical location but also as an important ethical object, and the Young have a moral obligation to the settlement site. Ultimately, the Young develop a strong emotional bond with the resettlement site.

This endorsement of the exclamation "I am from Yuanjiang" manifests in a variety of ways, such as through identification with the local language and diet. In terms of language use, the young have mastered the Yuanjiang dialect (Southwest Mandarin), and they frequently use the Yuanjiang dialect in daily life. Even individuals who do not speak the Yuanjiang dialect very often after leaving, in situations such as when they visit Yuanjiang County, tend to take the initiative to use the Yuanjiang dialect and identity themselves as Yuanjiang people. In terms of diet, they appreciate the local food and cultural symbols, with rice-flour noodles and peppers as the best representatives of this phenomenon. Their elders seldom eat rice noodles and peppers, while the Young regard these delicacies as essential foods.

These individuals did not establish any social relations or emotional connections in this location. However, after the returned overseas Chinese individuals had lived in the resettlement site for more than 40 years, the most significant factor in the relationship between the people and the place is that the Ganba resettlement site has changed from an unfamiliar space to a new homeland for these returned overseas Chinese individuals. The Young were born and raised at the resettlement site, and they thus experienced the process by which the resettlement site was developed into a new homeland.

The construction of a new homeland accompanies the place attachment construction. They put energy and finances into constructing resettlement site, and especially in the last decade, the investment has increased significantly. For example, in 2014, parts of the wasteland of the Young were included in the comprehensive development project of low hills and gentle slopes. During the land acquisition process, parts of the wasteland were requisitioned. After receiving compensation, they chose to build new houses not far from the resettlement site. In addition, they have invested large sums of money in planting crops. Furthermore, they have partnered to install ground drip irrigation and used excavators to convert steep wasteland into terraces. This series of actions shows that place attachment plays a driving role in constructing places.

Discussion

With the resettlement of returned overseas Chinese to farms in 1978, all the resettlement sites, including the Ganba resettlement site, have built new homelands. This study claims that the construction of a new homeland, the emotional experiences encountered during childhood, daily life, and the cultural logic of place attachment all shape the place attachment of the Young. In the early days of resettlement, the Ganba resettlement site was a relatively concentrated area focused on living and production. The livelihood of individuals living in this location was mainly crop cultivation, and returned overseas Chinese individuals lived a similar life. This experience with the resettlement site and the resulting social status establish a new homeland for returned overseas Chinese and their relatives.

Psychologist Hwang (2005) indicated that indigenous compatibility can be regarded as a guiding principle for the indigenization movement of psychology. Hwang (2015a) keenly indicated that the construction for culture-inclusive theories has to follow a basic principle of cultural psychology: "one mind, many mentalities; universalism without uniformity" (Shweder et al., 1998). This study found that the living state and mentality of the Young are becoming increasingly stable. The resettlement site has become a homeland to which young persons are solidly attached. The Young have progressed from experiencing a feeling of fear to the attainment of safety and happiness. This change has laid a certain psychological foundation for the generation of place attachment and formed a framework that can help maintain and strengthen place attachment. Returned overseas Chinese and their relatives identify the place in which they live with the cultural logic of Bao Yidi, and the resettlement site provides a guarantee of life for them and thus produces a place identity and puts this identity into practice with respect to the construction of a new homeland.

The information absorption process is contingent on the mindset (Nguyen et al., 2022). In the process of constructing place attachment, the Young developed different mentalities on the basis of traditional Confucian culture in responding to the sociocultural environments. Hwang (2012) believed that people living in different societies may

develop different mentalities on the basis of this deep structure in responding to their sociocultural environments. For example, the ethics standard of Rén (仁, benevolence) promoted by Confucianism plays an important role in shaping the place attachments of the Young. This ethics standard sees the world as an organic community, and the natural world is a link in the ethical chain of human beings, so man has a moral obligation to the natural environment. Influenced by traditional Confucian culture, returned overseas Chinese and their relatives are concerned with family maintenance and ethical order, following the principle of patrilineal succession and living according to the patrilocal residence. These principles, which are characteristic of traditional Confucian culture still play a role in homeland construction. For example, in terms of residence distribution, most of the returned overseas Chinese who lived in resettlement site have a relative relationship. As a result, relatively homogeneous communities have emerged in which social networks and interpersonal relationships have developed.

In the mindsponge process how individuals to spot and integrate new values as well as reason the values' appropriateness and usefulness in comparison to the existing core values are underlying themes (Vuong and Napier, 2015). The formation of place attachment to the resettlement site is not an instantaneous process; rather, according to the mindsponge mechanism, it involves a gradual and incessant information processing that the Young adapt to the geographic and socio-cultural environment of the resettlement site by accepting or rejecting new information and values. Our findings indicated that, after the returned overseas Chinese individuals had lived in the resettlement site for more than 40 years, they gradually established social relations in the resettlement site, especially when they intermarried with the local residents, they are able to integrate into the place and inherit traditional Confucian culture. In this case, the resettlement site becomes the new homeland of the Young, which affects their sense of place. Abundant research results indicate that attachment to numerous places continues to be strong (Riethmuller et al., 2021). Boğaç (2009) suggest that participants' future expectations shaped their attachment to their new homes, while their degree of attachment to their previous environments also played an important role in the attachment process. This case provides a new direction for thinking about cultural adaptation in immigration research and suggests that we should focus on the emotional issues associated with the relationships between people and places.

Although this study is a subject with social application value, it is significant from the point of view of migration, interculturality, and inclusion policies. As with all research, there are potential study limitations that could impact study results. First, the strength of place attachment and the factors influencing it among Young Overseas Chinese Relatives were not well represented in the qualitative data, and needs to use this epistemological strategy to conduct theoretical or empirical research. Hwang (2015a) indicated clearly that the construction of the *Mandala Model* and *Face and Favor* Model are the first step to attain the epistemological goal of indigenous psychology. These models were then used to develop culture-inclusive theories for Confucian morphostasis (Hwang, 2019). We agree with his theory that indigenous psychologists need a new "model of man" which may make a "true cultural turn" to achieve the aim of integrating culture and psychology. Indigenous psychologists have to construct culture-inclusive theories to reflect not only the deep structure of universal human mind but also the mentalities of people in a particular culture (Hwang, 2018).

Second, because this was a cohort study, the findings are by no means representative of all Young Overseas Chinese Relatives in the various resettlement sites. At best, this study can only shed light on the thoughts and feelings of the Young in Ganba resettlement site. Further research should adopt quantitative research, especially scale measurement and related data analysis, to draw relevant conclusions, rather than the more competitive research results proposed in this study. To achieve the goal of developing global psychology, it would take a large-scale research program to travel across the world to investigate all indigenous psychologies, and take into account the history and even the future of each culture (Hwang, 2005). Following this approach, a series of culture-inclusive theories can be constructed to constitute the scientific microworld of Confucian relationism (Hwang, 2019).

Third, the mindsponge framework has effectively explained many psychological phenomena or cognitive shifting processes. As a conceptual framework for information processing, mindsponge can be applied to many human psychological phenomena, consisting of both individual and collective/social levels (Vuong et al., 2022). In this study, the mindsponge mechanism provides insightful explanations for examining the process of shaping local attachments among the Young, and the mechanism helps to explain well the connections of childhood local memory, daily life, and emotional experience of young persons with place attachment. Future studies examining the psychological processes and formation of place attachment could be done based on Bayesian Mindsponge Framework analytics—a framework for a new perspective of the human mind's information processing mechanism (Vuong et al., 2022).

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

ZS, YD and XL participated in the design of this study, they all formulated the hypotheses and contributing to the discussions. ZS and XL carried out the study and collected important background information. ZS employed ethnographic fieldwork. YD and ZS collected local literature and materials. ZS and YD drafted the manuscript. ZS and XL performed manuscript review. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Anton, C. E., and Lawrence, C. (2014). Home is where the heart is: the effect of place of residence on place attachment and community participation. *J. Environ. Psychol.* 40, 451–461. doi: 10.1016/j.jenvp.2014.10.007

Beatty, A. (2014). Anthropology and emotion. *J. R. Anthropol. Inst.* 20, 545–563. doi: 10.1111/1467-9655.12114

Boğaç, C. (2009). Place attachment in a foreign settlement. *J. Environ. Psychol.* 29, 267–278. doi: 10.1016/j.jenvp.2009.01.001

Braun, V., and Clarke, V. (2013). *Successful Qualitative Research: A Practical Guide for Beginners*. London: Sage Publications Ltd.

Brown, G., and Raymond, C. (2007). The relationship between place attachment and landscape values: toward mapping place attachment. *Appl. Geogr.* 27, 89–111. doi: 10.1016/j.apgeog.2006.11.002

Chawla, L. (1992). "Childhood place attachments" in *Place Attachment*. eds. I. Altman and S. M. Low (Midtown Manhattan, New York: Springer US), 63–86.

Cobb, E. M. (1977). *The Ecology of Imagination in Childhood*. Washington, D.C.: Spring Publications.

Cresswell, T. (2014). *Place: An Introduction*. Hoboken, NJ: John Wiley & Sons.

Cutts, M. (2000). *The State of the World's Refugees, 2000: Fifty Years of Humanitarian Action*. Geneva: UNHCR, Oxford University Press.

Dovey, K. (1985). "The quest for authenticity and the replication of environmental meaning" in *Dwelling, Place and Environment: Towards a Phenomenology of Person and World*. eds. D. Seamon and R. Mugerauer (Dordrecht: Springer Netherlands), 33–49.

Ewing, K. P. (2005). "Immigrant identities and emotion" in *A companion to Psychological Anthropology*. eds. C. Casey and R. B. Edgerton (Oxford: Blackwell Publishing Ltd)

Guest, G., Bunce, A., and Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 18, 59–82. doi: 10.1177/1525822X05279903

Haviland, W. A., Prins, H. E. L., McBride, B., and Walrath, D. (2010). *Anthropology: The Human Challenge*. *13th*. Belmont, CA: Wadsworth Publishing.

Hay, R. (1998). Sense of place in developmental context. *J. Environ. Psychol.* 18, 5–29. doi: 10.1006/JEVP.1997.0060

Hwang, K. K. (2005). From anticolonialism to postcolonialism: the emergence of Chinese indigenous psychology in Taiwan. *Int. J. Psychol.* 40, 228–238. doi: 10.1080/00207590444000177

Hwang, K.-K. (2012). "The deep structure of Confucianism" in *Foundations of Chinese Psychology: Confucian Social Relations*. ed. K.-K. Hwang (New York, NY: Springer New York), 99–131.

Hwang, K.-K. (2015a). Cultural system vs. pan-cultural dimensions: philosophical reflection on approaches for indigenous psychology. *J. Theory Soc. Behav.* 45, 2–25. doi: 10.1111/jtsb.12051

Hwang, K.-K. (2015b). Culture-inclusive theories of self and social interaction: the approach of multiple philosophical paradigms. *J. Theory Soc. Behav.* 45, 40–63. doi: 10.1111/jtsb.12050

Hwang, K. K. (2018). Five virtues: scientific approach for studying Confucian ethics and morality. *Int. J. Sci. Res. Methodol.* 10, 176–198.

Hwang, K. K. (2019). *Culture-Inclusive Theories: An Epistemological Strategy*. United Kingdom: Cambridge University Press.

Jin, R., and Wang, X. (2022). "Somewhere I belong?" a study on transnational identity shifts caused by "double stigmatization" among Chinese international student returnees during COVID-19 through the lens of mindsponge mechanism. *Front. Psychol.* 13:1018843. doi: 10.3389/fpsyg.2022.1018843

Lam, T. (2000). The exodus of Hoa refugees from Vietnam and their settlement in Guangxi: China's refugee settlement strategies. *J. Refug. Stud.* 13, 374–390. doi: 10.1093/jrs/13.4.374

Lefebvre, H. (1991). *The Production of Space*. London: Blackwell.

Malinowski, B. (1992). *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea*; Aldershot: Routledge.

Marcus, C. C. (1992). "Environmental Memories" in *Place Attachment*. eds. I. Altman and S. M. Low (Boston, MA: Springer US), 87–112.

Million, M. L. (1992). *"It Was Home": A Phenomenology of Place and Involuntary Displacement as Illustrated by the Forced Dislocation of Five Southern Alberta Families in the Oldman River Dam Flood Area*. Doctoral dissertation. San Francisco, California: Saybrook Institute Graduate School and Research Center.

Morgan, P. (2010). Towards a developmental theory of place attachment. *J. Environ. Psychol.* 30, 11–22. doi: 10.1016/j.jenvp.2009.07.001

Nguyen, M.-H., La, V.-P., Le, T.-T., and Vuong, Q.-H. (2022). Introduction to Bayesian Mindsponge framework analytics: an innovative method for social and psychological research. *MethodsX* 9:101808. doi: 10.1016/j.mex.2022.101808

Patterson, M. E., and Williams, D. R. (2005). Maintaining research traditions on place: diversity of thought and scientific progress. *J. Environ. Psychol.* 25, 361–380. doi: 10.1016/j.jenvp.2005.10.001

Proshansky, H. M. (1978). The City and self-identity. *Environ. Behav.* 10, 147–169. doi: 10.1177/0013916578102002

Ramkissoon, H. (2020). Perceived social impacts of tourism and quality-of-life: a new conceptual model. *J. Sustain. Tour.* 31, 442–459. doi: 10.1080/09669582.2020.1858091

Ramkissoon, H., Mavondo, F., and Uysal, M. (2018). Social involvement and park citizenship as moderators for quality-of-life in a national park. *J. Sustain. Tour.* 26, 341–361. doi: 10.1080/09669582.2017.1354866

Riethmuller, M. L., Dzidic, P. L., and Newnham, E. A. (2021). Going rural: qualitative perspectives on the role of place attachment in young people's intentions to return to the country. *J. Environ. Psychol.* 73:101542. doi: 10.1016/j.jenvp.2020.101542

Scannell, L., and Gifford, R. (2010). Defining place attachment: a tripartite organizing framework. *J. Environ. Psychol.* 30, 1–10. doi: 10.1016/j.jenvp.2009.09.006

Seamon, D. (2000). "A way of seeing people and place" in *Theoretical Perspectives in Environment-Behavior Research: Underlying Assumptions, Research Problems, and Methodologies*. eds. S. Wapner, J. Demick, T. Yamamoto and H. Minami (Boston, MA: Springer US), 157–178.

Shang, Z., and Luo, J. M. (2021). Modeling of the impact of the credibility of the destination endorser on the place attachment of potential tourists. *Front. Psychol.* 12:207. doi: 10.3389/fpsyg.2021.759207

Shweder, R. A., Goodnow, J., Hatano, G., Le Vine, R., Markus, H., and Miller, P. (1998). "The cultural psychology of development: one mind, many mentalities" in *Handbook of Child Psychology (Vol. 1): Theoretical Models of Human Development*. ed. W. Damon (New York: John Wiley & Sons)

Song, L. (2014). Who shall we help? The refugee definition in a Chinese context. *Refug. Surv. Q.* 33, 44–58. doi: 10.1093/rsq/hdt022

Tuan, Y. (1990). *Topophilia: A Study of Environmental Perception, Attitudes, and Values*. New York City: Columbia University Press.

Vuong, Q. H., and Napier, N. K. (2015). Acculturation and global mindsponge: an emerging market perspective. *Int. J. Intercult. Relat.* 49, 354–367. doi: 10.1016/j.ijintrel.2015.06.003

Vuong, Q.-H., Nguyen, M.-H., and La, V.-P. (2022). *The Mindsponge and BMF Analytics for Innovative Thinking in Social Sciences and Humanities*. Berlin: De Gruyter.

Williams, D., and Vaske, J. (2003). The measurement of place attachment: validity and generalizability of a psychometric approach. *For. Sci.* 49, 830–840. doi: 10.1093/forestscience/49.6.830

Wullenkord, M. C., Heidbreder, L. M., and Reese, G. (2020). Reactions to environmental changes: place attachment predicts interest in earth observation data. *Front. Psychol.* 11:1442. doi: 10.3389/fpsyg.2020.01442

Zheng, J.. (2015). *From Nanqiao to refugee: The formation of China's policy toward Indochinese refugees, 1978–1979*. PHD thesis. Guangzhou: Jinan University (in Chinese).

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Cross-cultural study of kinship premium and social discounting of generosity

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Social discounting predicts that one's concern for others decreases with increasing social distance. Cultural dimensions may influence this social behavior. Here, we used a dictator game, in which the participants and real members of their social entourage profited from the partition of the endowments determined by the participant, to compare how Chinese and French university students shared endowments with people at different social distances. We tested two hypotheses based on the concepts of kinship premium and cultural collectivism. Stronger ties between close family members were expected among Chinese. This may predict a larger "kinship premium," i.e., increased generosity to family members at close social distances, in Chinese relative to French participants. Similarly, because collectivism is thought to be stronger in Asian than western societies, greater generosity at larger social distances might also be expected among Chinese participants. The results showed that Chinese were more generous than French at close social distances but discounted more as social distance increased. This difference between French and Chinese was confined to family members and no significant difference in generosity was observed between French and Chinese for non-family members at any social distance. Our findings evidence a stronger kinship premium among Chinese than French students, and no significant effect of cultural collectivism.

KEYWORDS

social discounting, kinship premium, altruism, cultural collectivism, Chinese, generosity

1. Introduction

Altruism, generosity at one's own expense, is an important component of human prosocial behavior. However, individuals are not equally generous to everyone and tend to favor family and people with whom they have close personal relationships. Social discounting is based on the concept of temporal discounting, a well characterized phenomenon by which a reward progressively loses subjective value with the delay that is imposed prior to the reward's arrival (Rachlin et al., 1991). In either real or hypothetical experiments, participants have been asked to choose how to allocate money or other resources, between themselves and potential recipients at different social distances. The amount donated usually falls with increasing social distance between the two parties (Wu et al., 2011; Strang et al., 2017). Thus, the subjective value of being more generous is discounted as social distance increases.

One of the most studied inter-cultural dimensions is the degree of Collectivism/Individualism (Hofstede, 1980b, 1984; Triandis, 1989). Collectivism is a characteristic of cultures in which people perceive themselves to be integrated and interdependent, whereas in individualistic societies, people are more focused on their own wellbeing, and that of closely related others such as immediate family (Hofstede, 1980a, p. 45; Hofstede, 1984; Markus and Kitayama, 1991; Kitayama and Uskul, 2011). One might thus expect different patterns of social discounting in participants who conform to collectivist as opposed to individualist cultural identities. Cross-cultural variations in social discounting might even provide an objective measure for the degree of social integration of individuals with other members of their society.

Generosity to genetically related others, such as close family members, has also been distinguished from generosity to friends or other unrelated individuals (Darlington, 1978). Indeed, more recently, studies have shown that kinship creates a specific unique contribution to generosity over and above the effects of emotional closeness such that participants in experiments are more generous to kin than might be expected if generosity depended on emotional closeness alone. This has been defined as "kinship premium" (Curry et al., 2013; Pollet et al., 2013; Booysen et al., 2018a). Social discounting has also evidenced such kinship premiums (Rachlin and Jones, 2008; Booysen et al., 2018a).

Collectivism or social interdependence is thought to be stronger in Asian than in western societies (Leung and Iwawaki, 1988; Hui et al., 1991; Oyserman et al., 2002). Previous cross cultural studies have compared social discounting in Japanese and German students (Ishii and Eisen, 2018), Chinese and German students (Strombach et al., 2014) and Japanese and American students (Ito et al., 2011; Romanowich and Igaki, 2017; Stegall et al., 2019). Two studies found that western participants were more generous at close social distances but discounted more rapidly as social distance increased, and this was taken as evidence that the greater social cohesiveness of Asian societies was reflected by lower levels of social discounting (Strombach et al., 2014; Ishii and Eisen, 2018). However, two studies reported no significant differences between Asian and Western participants (Romanowich and Igaki, 2017; Stegall et al., 2019) or Americans and Germans (Stegall et al., 2019), and one found that Asian participants (Japanese), discounted more rapidly than American college students as social distance increased (Ito et al., 2011). These mixed findings indicate that more research is needed to understand the influence of cultural differences on social discounting, and, no study analyzed whether social discounting was affected by cross-cultural differences in kinship premiums.

Most cross-cultural studies used abstract games to study social discounting. All were based on binary decision tasks that measure participants' preference for a generous or a more selfish option, to divide money or other resources between themselves and another at a given social distance. This forced choice may influence the decisions made by the participants. Indeed, neither of the options offered on a given trial may reflect the true preference of the participants. Furthermore, calculation of the participants' generosity at a given social distance can be complicated because an accurate estimation of a participant's generosity depends on the participant behaving consistently across all the trials at each social distance. This is frequently not the case (Booysen et al., 2018b). Finally, many of the previous studies are completely or partially hypothetical, with the participants' decisions having no concrete consequences for themselves and/or the hypothetical "recipients."

We took a new approach to study social integration and kinship premium by analyzing social discounting with a concrete dictator game. Participants chose freely how to divide endowments, that varied in size on different trials, with recipients at different social distances. These recipients were not hypothetical, participants identified them from their own social entourage. Only at high social distances were potential beneficiaries anonymous. At the end of the experiment a single trial was chosen at random and its consequences applied to both the participant and the recipient. Thus, both participants and recipients would enjoy the fruits of the participants' avarice or largesse. This non-deceptive and non-hypothetical approach allowed us to mitigate concerns that have been raised concerning hypothetical biases that occur in similar economic games (Forsythe et al., 1994; Ben-Ner et al., 2008; Bühren and Kundt, 2015). Furthermore, participants were absolutely free to choose how much to donate, without any external cues as to what might constitute a generous or selfish allocation. Finally, we used participants from two countries, France and China, known to exhibit different levels of Individualism/Collectivism. This rigorous behavioral economics approach allowed us to study first whether social discounting differs between groups with different levels of Collectivism and second to compare kinship premiums in university students from the two countries.

2. Materials and methods

2.1. Participants

A total of 102 subjects participated in our experiment. Testing was carried out in 2 laboratories: South China Normal University (Guangzhou, China) and Institute of Cognitive Science (Lyon, France). A total of 51 Chinese participants (26 females; M_{age} = 20.45, SD = 1.36) were students recruited at the SCNl University and 51 French participants (25 females; M_{age} = 21.24, SD = 2.14) were students recruited from the Lyon 1 University. The sample size was based on a reference study in the domain which tested around 50 participants per group (Strombach et al., 2014). All participants were psychiatrically and neurologically healthy and indicated they were not taking any medication. The two studies were approved by the local ethics committees. All experimental protocols and procedures were conducted in accordance with institutional review-board guidelines for experimental testing and complied with the latest revision of the Declaration of Helsinki. Participants gave written consent for participation in the study and were free to leave at any time.

2.2. Experimental design

Subjects were required to perform a self-representation task in which they rated their level of intimacy with a list of relationships on a 100-point scale: mother, father, siblings, grandparents, kin, best friend, roommate, colleagues, neighbors, acquaintances, partner, strangers and friend circle. When subjects had no equivalent social relationship (e.g., partner) they skipped that question.

Subjects then performed the social discounting task, which was a dictator game repeated over 40 trials in a random order in which subjects chose how to split an endowment between themselves and identified recipients at different social distances. First, the subjects were required to identify the recipients from their own social entourage that best corresponded to each social distance (1, 2, 3, 5, 10, 20, 50, and 100), and indicate the relationship between them (i.e., Social Distance 1, name: Mary March, relationship: Mother). Participants were informed that a random trial would be selected, in which the receiver was sent 10% of the amount indicated by the participant for that trial. Importantly, because by definition the receivers at social distances 50 and 100 corresponded to someone that participants did not know, the money for the trials corresponding to these social distances would be sent to a charity project (online payment platform). We also varied the size of the endowment within subjects with five different endowment sizes at each social distance (€80, €90, €100, €110, and €120, or the same amount in Yuan for Chinese subjects). This allowed as to calculate mean values for generosity at each social distance for each participant and to determine whether the endowment size altered their generosity.

In each trial, social distance was represented on a scale of 101 small icons displayed at the top of the screen. The subject was indicated by a white icon at the left extremity, and the receiver by a blue icon labeled with a number, the smaller the number, the closer the social distance (**Figure 1**). Unlike previous studies, which used forced choices, in our study generosity could be measured directly as the proportion of the endowment that the participants chose freely to donate. The amount of the endowment for the trial was displayed on the screen, and the participant indicated how much was given to the recipient. This amount could not exceed the endowment. Finally, at the end of the trial the participant was reminded how the money had been allocated.

Participants received a fixed amount of € 6 in France and 10 Yuan in China. These amounts were selected because in July 2016 (when the experiments took place), the French purchasing power was about 1.6 times that in China. In addition, the participant received their share of the allocation from the randomly selected trial paid at 10% of its full value. Participants transferred the money directly to their recipients under the supervision of experimenters by bank accounts (French), and by the payment application of Alipay or Wechat (Chinese).

Once the 40 trials elapsed, participants completed the shortened version of the Individualism-Collectivism (IND-COL) scale composed of 33 items on a 6-point scale to test for between and within culture variations (Hui and Yee, 1994). This scale allows participants to be scored with respect to five primary categories of Individualism and Collectivism: "Kin and neighbors/susceptibility to influence (KN)," measures the extent to which participants are influenced by family and neighbors as opposed to having a more independent attitude, "Neighbor/social isolation (NE)," measures the extent of social interaction and casual relationships with their neighbors, "Colleagues and friends/supportive exchanges (CF)": measures the degree of interdependence of participants with coworkers and friends, "Parents and spouse/distinctiveness of personal identity (PS)," measures the participants' individualism within their nuclear family, and, "Parents/consultation and sharing (PA)": measures the extent to which participants are influenced by and interact with their parents. Two second order factors, "Ingroup Solidarity" (calculated from the sums of the CF, PA, and PS subscales) and "Social Obligation" (calculated from the sum of the KN and NE subscales) and a global IND-COL score (the sum of all five subscales) are calculated from these scores. Finally, participants were asked to what extent they identified with their own culture on a scale from 1 to 5.

The task was programmed using *E-prime 2.0* and all the instructions were delivered in the subjects' native language. The detailed instructions, can be found in the **Supplementary material** section.

2.3. Model estimation

To analyze social discounting we fitted the following discounting functions: the Constant Sensitivity model [Ebert and Prelec, 2007; Eq. (1)], Beta-Delta model [Laibson, 1997; Eq. (2)] and the Hyperbolic model [Jones and Rachlin, 2006, 2009; Eq. (3)]. One of our central hypotheses was that individuals with different levels of collectivism/individualism may show different patterns of social discounting that may be best accounted for by different models, or by the same model but with different values of the pertinent variables for that model.

$$v = e^{\left[-(a*D)^b\right]} \tag{1}$$

$$v = \beta * \delta^D \tag{2}$$

$$v = \frac{V}{1 + kD} \tag{3}$$

In all the equations v indicates the subjective value to the participant of being generous to the recipient and D symbolizes the social distance. Respectively, Eq. (1), the Constant Sensitivity model: a sets the distance to a theoretical boundary that separates close from distant relationships, and b represents the degree of sensitivity to social distance. For smaller values of b there is less sensitivity to social distance, which indicates that the participant discriminates less between recipients at closer and recipients at more distant social distances. Eq. (2), the Beta-Delta model: β represents the extra value awarded to the closest social distance value and δ captures a constant rate of social discounting, that is, δ determines the rate at which generosity decreases as social distance increases, in the standard exponential model. When δ is higher the participants will discriminate proportionally more between recipients at closer and more distant social distances Eq. (3), the Hyperbolic model: k represents a constant that measures the degree of social discounting, i.e., the extent to which generosity decreases at each social distance compared to V, which is the theoretical undiscounted value of generosity at distance $D = 0$. Higher values of k will result in the participants discriminating proportionally more between recipients at closer and recipients at greater social distances.

We fitted the models to the individual social discounting curves of each participant. The curves were generated from the mean proportions of each of the five endowments allocated by each participant, at each social distance. Use of the mean percentage of the amount given by each participant, as opposed to the median was justified by the fact that our participants made free choices, as opposed to forced choices between a series of more or less generous offers at each social distance (Rachlin and Jones, 2008; Strombach et al., 2014). The non-linear least-squares estimation, *nlmrt* package (Nash, 2012) in R was used to calculate the Akaike Information

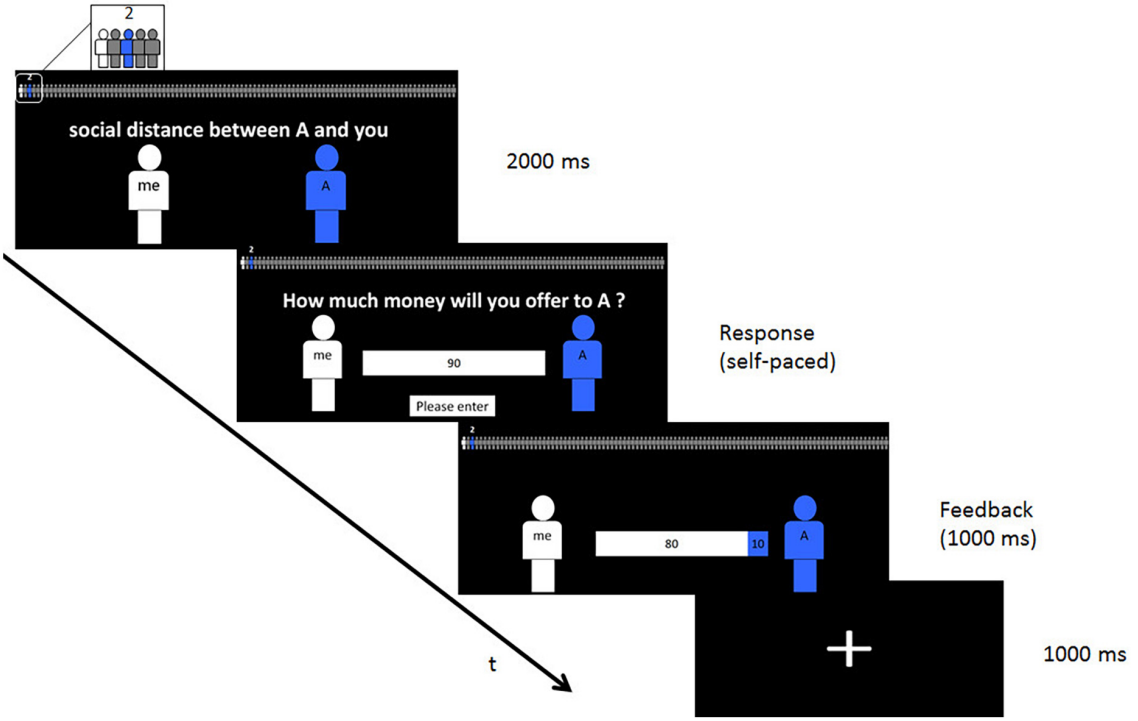

FIGURE 1
Experimental design. After a fixation cross, a social distance line was displayed across the top of the screen showing a white and a blue person, respectively, representing the participant and the receiver. The number above the blue icon indicated their exact social distance to the participant. Then, participants were shown one of 5 possible endowments (€80, €90, €100, €110, €120 for French, or the same amount in Yuan for Chinese subjects). Participants had to type on a keyboard the exact amount that they were willing to send to the recipient (here €10). A feedback screen indicated the amounts for the participant (here €80), and the receiver (here €10).

Criterion (AIC) for how well each individual fit each model, and the sum of AIC for all individuals fitting that model was used to calculate the group AIC. Since the overwhelming majority of AIC were negative (98.5%), the sum of the AIC for all the subjects fitting that model reflects the goodness of fit of the whole group of curves, one for each participant, to each model. The model with the lowest Group AIC was that which best reflects the group as a whole. The mean Individual AIC reflects how well each individual in the Group fits each model. Results from the model estimation show that one Chinese and one French participant did not fit the Hyperbolic model.

2.4. Regression analysis

To address how specific factors (e.g., Culture, family relationships, subscales of IND-COL scale etc.) affected generosity across social distance, we conducted 6 separate generalized linear models (GLMs) with the proportion of the endowment given as a dependent variable. We use GLMs with a logit link function and a binomial family to account for the specificity of the dependent variable, we also clustered the standard error at the participant level. Specifically, we ran 3 GLMs at social distances 1∼100 (GLMs 1, 2, and 3), and 3 GLMs for social distances 1∼20 (for GLMs 4, 5, and 6), using the glm function from STATA. We included in all GLMs the following independent variables: whether the participant was French or Chinese (variable French, Chinese = 0, French = 1), the social distance (8 level values for GLMs 1, 2, and 3: 1, 2, 3, 5, 10, 20, 50, and 100; and 6 values for GLMs 4, 5, and 6: 1, 2, 3, 5, 10, and 20), the endowment size (€80, €90, €100, €110, €120), whether the recipient was a family member or not (variable Family member). In GLMs 2 and 5, we also included interactions between the variable Family member, Distance and French. In addition to these interactions, we also included the five subscales of the IND-COL as variables in GLMs 3 and 6.

To identify correlations between social discounting and the participants' scores on the IND-COL scales, linear regressions were performed between the participants' IND-COL scores on each of the five subscales, the 2 s order factors (Ingroup solidarity and Social Obligation) and their global IND-COL score with their individual scores for the parameters in the three models (a and b for the Constant Sensitivity model, β and θ for the Beta-Delta model and V and k for the hyperbolic model) in R.

3. Results

3.1. Cultural comparison of French and Chinese participants

Participants rated their level of identification with their respective culture on a five-point Likert scale. Chinese participants felt significantly more connected to their culture than the French, (Mann-Witney U-test; M Chinese = 4.08, SD Chinese = 0.72; M French = 3.67, SD French = 0.91; z = 2.58, p = 0.01, U = 1648). This closer association was similar to that reported previously when Chinese were compared to Germans (Strombach et al., 2014).

For the Self-Representation task, the Chinese self-rated their closeness to progenitors (mother, father, grandparents) and groups of people in society (neighbors, circle of friends, acquaintances, or strangers) significantly closer than the French (unpaired *t*-test, $p < 0.05$) (Table 1). However, Chinese and French participants were not different in their ratings of closeness to their peers (siblings, best friend, roommates, colleagues or partner). Globally these results show a tendency for French participants to consider themselves to be more socially distant than the Chinese from family authority figures (parents and grandparents), and also groups of people in society (circle of friends, neighbors, strangers). This is broadly in agreement with similar experiments comparing Chinese and German students (Strombach et al., 2014). However, unlike German students, the French students in our study also considered themselves as more socially distant from strangers, their circle of friends, their neighbors and indeed their acquaintances than the Chinese.

The shortened version of the Individualism-Collectivism scale (Hui and Yee, 1994), in which higher scores indicate more collectivist tendencies, also highlighted cultural differences (Table 2). Although there was no significant difference between the global IND-COL scores of the French and Chinese participants ($M_{\text{Chinese}} = 12.82$, $SD_{\text{Chinese}} = 13.04$; $M_{\text{French}} = 9.35$, $SD_{\text{French}} = 12.12$), Chinese participants scored significantly higher in two individual subscales, among five that represent how individuals relate to relationships. Specifically, the Chinese scored significantly higher than the French in the "Kin and neighbors/susceptibility to influence" (M Chinese = 1.10, SD Chinese = 5.58; M French = −0.94, SD French = 3.54; $t = 2.204$, $p = 0.03$) and the "Neighbor/social isolation" factors (M Chinese = −12.39, SD Chinese = 5.10; M French = −15.90, SD French = 5.14; $t = 3.463$, $p < 0.001$). For the three other individual subscales scores were not significantly different between the two pools of participants (Table 2). With regard to the higher order factors, Ingroup Solidarity, provides a measure of the participants collectivism with regard to the nuclear family and close friends, whereas, Social Obligation measures integration and collectivism with respect to society as a whole (Hui and Yee, 1994). There was no significant difference between the French and the Chinese students with respect to the former, however, for the latter the Chinese participants scored significantly higher (M Chinese = −11.29, SD Chinese = 7.91; M French = −16.84, SD French = 6.44; $t = 3.885$, $p < 0.001$), indicating a higher degree of collectivism with society as a whole.

These results reinforce the picture that the Chinese students feel generally more integrated with their society as a whole than the

TABLE 1 Mean perceived social distance in the self-representation task.

Relationship	Chinese	French	t	df	*p*
Mother	5.54 (9.39)	10.29 (10.52)	−2.397	98.14	0.018*
Father	6.53 (9.15)	20.08 (24.98)	−3.637	63.191	0.001**
Brother and sister	9.22 (11.08)	11.88 (13.24)	−1.097	96.629	0.275
Grandparents	14.80 (14.96)	26.75 (21.59)	−3.228	89.253	0.002**
Kinships	29.39 (21.59)	29.59 (18.96)	−0.049	98.359	0.961
Best friend	12.06 (10.32)	13.37 (13.31)	−0.557	94.144	0.579
Roommates	24.86 (16.95)	29.55 (22.15)	−1.2	93.615	0.233
Classmates	38.73 (21.32)	41.94 (22.26)	−0.745	99.817	0.458
Neighbors	47.29 (24.48)	71.41 (22.32)	−5.2	99.156	0.000***
Acquaintances	36.49 (21.49)	60.35 (21.60)	−5.593	99.997	0.000***
Partner	13.22 (19.11)	7.51 14.66)	1.274	34.166	0.211
Strangers	81.68 (19.75)	98.20 (5.54)	−5.697	56.529	0.000***
Circle of friends	47.98 (25.98)	72.00 (17.86)	−5.405	86.683	0.000***

The mean social distance to different types of social relations as estimated by the participants in the self-representation task. Standard errors are in parentheses. The significance of differences was determined by an unpaired student's *t*-test. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

TABLE 2 Results of individualism-collectivism scale IND-COL scales and subscales (Hui and Yee, 1994).

Scale	Chinese	French	t	df	*p*
CF	21.67 (5.25)	22.45 (4.01)	−0.848	93.502	0.398
PA	2.29 (2.68)	1.98 (2.79)	0.579	99.835	0.564
PS	0.37 (3.58)	1.76 (5.41)	−1.533	86.825	0.129
KN	1.10 (5.58)	−0.94 (3.54)	2.204	84.54	0.03*
NE	−12.39 (5.10)	−15.90 (5.14)	3.463	99.993	0.001***
In group solidarity	24.12 (8.97)	26.20 (8.16)	−1.224	99.12	0.224
Social obligation	−11.29 (7.91)	−16.84 (6.44)	3.885	96.031	0***
Global	12.82 (13.43)	9.35 (12.12)	1.37	98.972	0.174

Mean results of the IND-COL test for the Chinese and French students. Standard errors are in parentheses. The significance of differences was determined by an unpaired student's *t*-test. *$p < 0.05$, ***$p < 0.001$. CF, PA, PS, KN, and NE stand for subscales colleagues and friends/supportive exchanges, parents/consultation and sharing, parents and spouse/distinctiveness of personal identity, Kin and neighbors/susceptibility to influence, and neighbor/social isolation, respectively. Higher scores indicate a greater degree of collectivism.

French, however, differences with respect to close family and friends are less consistent. The French family relationships and in particular parents were scored as being significantly more distant than the Chinese on the self-representation task, but were not significantly different to the Chinese on the associated IND-COL subscales or with respect to Ingroup Solidarity.

3.2. Comparison of French and Chinese recipients at different social distances

Participants were required to choose recipients from their own social entourage (family and friends etc.) that best corresponded to the social distances 1, 2, 3, 5, 10, and 20, in which 1 corresponds to the closest person to them and 100 corresponds to a perfect stranger. The recipients at distance 50 and 100 were anonymous since the former would correspond to a person they occasionally encounter, but do not know, and the latter to a person they do not know at all.

We compared the types of relationship between Chinese and French participants and their choices for recipients at social distances 1 to 20. Both the French and the Chinese identified similarly high proportions of family members (Mother, Father, Brother or Sister, Grandparents, other blood relatives, and Partner) at social distances 1 (>90%), 2 (>70%), 3 (>50%) and 5 (>40%) (Figure 2). However, at social distances 10 and 20 about 40% of French participants continued to include blood relatives whereas significantly fewer Chinese participants, (about 20%), did so (social distance 10: (N Chinese = 10, N French = 23; $\chi^2 = 6.451$, df = 1, $p = 0.011$); and social distance 20: (N Chinese = 11, N French = 27; $\chi^2 = 8.137$, df = 1, $p = 0.004$).

For each social distance, we compared the proportion of the endowments donated across Groups (Table 3). As expected, generosity decreased as social distance increased. We observed a significant difference in the allocation of the endowment by the French and the Chinese at social distance 1, (M Chinese = 0.843, SD = 0.198; M French = 0.672, SD = 0.217, $t = 4.15$, $p < 0.001$); social distance 2, (M Chinese = 0.703, SD = 0.227; M French = 0.573, SD = 0.240, $t = 2.81$, $p < 0.01$); and social distance 3 (M Chinese = 0.165, SD = 0.131; M French = 0.114, SD = 0.153, $t = 2.00$, $p < 0.05$). However, at greater social distances there was no significant difference between the proportions of the endowments donated by the French and the Chinese.

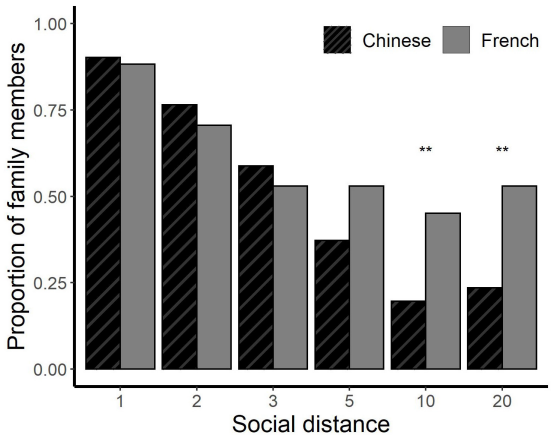

FIGURE 2
Inclusion of family at the social distance range 1~20. Less participants choose family members as recipients at greater social distances, this decline was more rapid for the Chinese than for the French. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

3.3. Model-based results

To determine how social distance affects generosity, we compared the group giving behavior of Chinese and French with 3 different models (the Hyperbolic model, the Beta-delta model, and the Constant Sensitivity model). The major difference between the three models concerns the predicted evolution of discounting behavior as social distance increases. All the models predict that generosity will decline as social distance increases. For the hyperbolic model and the Beta-Delta model the difference in generosity per unit of social distance should decline as social distance increases according to hyperbolic and exponential curves, respectively. Similarly, for the Constant Sensitivity model when $b < 1$ the generosity per unit of social distance declines exponentially as social distance increases. However, when $b > 1$ and social distance <1/a, generosity declines less rapidly per unit of social distance.

The best model to account for the data of Chinese participants was the Constant Sensitivity model (mean AIC Constant Sensitivity $_{Chinese} = -64.95$, Table 4 and Figure 3). Both the Hyperbolic model (mean AIC Hyperbolic $_{Chinese} = -61.28$) and the Beta Delta model (mean AIC Beta/Delta $_{Chinese} = -59.79$) were significantly worse at explaining their behavior. The best model to account for the data of the French participants was the Beta-Delta model (mean AIC Beta/Delta $_{French} = -67.53$). At the individual level this was only just better than the Constant Sensitivity model (AIC Constant Sensitivity $_{French} = -65.48$) and the Hyperbolic model (AIC Hyperbolic $_{French} = -65.28$), however, the above are the mean differences in AIC for each individual in the group. The Group differences in AIC are 51-fold higher ($N = 51$), indicating that the best models to account for the data of each group is much better than the second or third best models. Thus, although there is some justification for comparing the two groups with respect to the parameters a and b of the Constant Sensitivity model, which fits the French at least as well as it fits the Chinese, and is globally the best model for the two groups combined (Table 5), comparisons for the parameters of the Beta Delta model or the Hyperbolic model are rather more tenuous.

The parameter a, which in our experiment delimits the border between "close" and "distant" social relations, (defined as $1/a$), was not significantly different between French and Chinese participants (M Chinese = 0.187, M French = 0.313; $U = 995$, $Z = 1.902$, $p = 0.057$). This indicates that the social distances at which the French and Chinese participants discriminate close from distant relationships with respect to their generosity are not significantly different. However, the parameter b of the Constant Sensitivity model differed significantly between the Chinese and French (Mann-Whitney U-test; M Chinese = 0.932, M French = 0.525; $U = 1848$, $Z = 3.892$, $p < 0.001$), indicating that the Chinese show significantly greater sensitivity to social distance. This also suggests that for a significant number of Chinese participants $b > 1$. When this is the case social discounting occurs more slowly at very low social distances and then increases according to an exponential decay at the

TABLE 3 Proportion of the endowments allocated to recipients at each social distance.

Social distance	Chinese mean (SD)	French mean (SD)	t	df	*p*
1	0.84 (0.20)	0.67 (0.22)	4.147	99.211	0.000***
2	0.70 (0.23)	0.57 (0.24)	2.805	99.688	0.006**
3	0.66 (0.26)	0.56 (0.25)	2.001	99.978	0.048*
5	0.56 (0.27)	0.47 (0.20)	1.764	92.056	0.081
10	0.43 (0.24)	0.43 (0.21)	−0.036	97.477	0.971
20	0.36 (0.22)	0.36 (0.19)	0.097	98.502	0.923
50	0.17 (0.13)	0.11 (0.15)	1.831	97.719	0.070
100	0.07 (0.08)	0.08 (0.15)	−0.453	77.43	0.652

Standard errors are in parentheses; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

TABLE 4 Model selection according to AIC.

Model	Formula	Individual AIC (mean)		Group AIC	
		Chinese	French	Chinese	French
Constant sensitivity	$v = e^{\left[-(a*D)^b\right]}$	−64.95	−65.48	−3208	−3339
Beta-delta	$v=\beta*\delta^D$	−59.79	−67.53	−3049	−3444
Hyperbolic	$v = \frac{V}{1+kD}$	−61.28	−65.28	−3063	−3263

Mean individual AIC (for all participants). The group AIC is the sum of all the AIC for all group members that fit the model. One Chinese participant did not fit the Constant Sensitivity model. Another Chinese participant and one French student did not fit the Hyperbolic model. Since the vast majority of AIC values (over 97%) were negative, the non-inclusion of a group member who did not fit that model tended to penalize the group AIC of that model. Globally, all the models tended to fit the French better than the Chinese. The Constant Sensitivity model was the best model for all participants and by far the best model for the Chinese, however, the beta-delta model was the best model for the French, but the worst model for the Chinese.

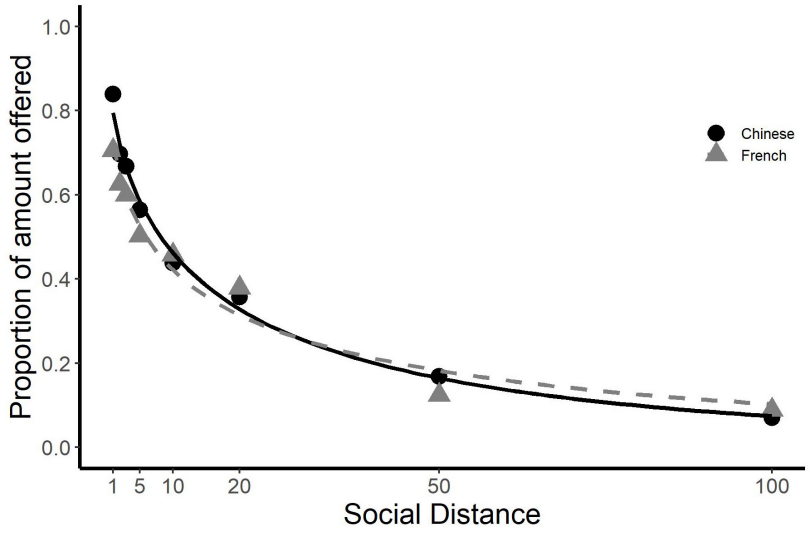

FIGURE 3
Social discounting behavior of Chinese and French participants in the Constant Sensitivity model. The graph shows the proportions of endowments offered by the participants to recipients at each social distance, as estimated by the Constant Sensitivity model, which was globally the best model to account for social discounting for all participants and for the Chinese participants in particular. Although it was not the best model of the French students' discounting behavior, it fit them similarly well as the Chinese.

frontier between close and distant social distances as determined by the parameter *a*.

3.4. Regression analysis of factors affecting social discounting

To understand which factors shaped the social discounting curves of the French and Chinese participants we used General Linear Models (GLMs) to analyze the data. We conducted three GLMs for distributed differences between French and Chinese participants at social distances 1∼100. We tested whether the proportion of endowment donated by each participant was affected by the group (variable Nationality, with the French equals 1, and the Chinese equals 0), by endowment size (variable Endowment), social distance between the participant and the recipient (variable Distance), whether the recipient was a family member or not (variable Family member, equals 1 when the recipient was a family member and

0 otherwise). We ran three logit transformed GLMs and reported the marginal effects (Figure 4 and Table 6). We varied whether we included interactions between the variable Nationality, Distance and Family member (GLM2) and whether we included the 5 components of the IND-COL scale (GLM3).

Results showed that the French were overall less generous than Chinese participants (GLM1, Nationality), that participants were more generous with larger endowments (GLM1, Endowment), that generosity decreased with increasing social distance, (GLM1, Distance) and, that participants were more generous to family members than other recipients (GLM1, Family member). This last finding indicates that both the French and Chinese family members profited from a kinship premium. Concerning the interactions reported in model GLM 2, we found that Chinese participants were more sensitive to social distance, discounting more than the French as social distance increased (GLM 2, Nationality × Distance). However, the Chinese were only marginally more generous to family members than non-family members than the French. The significance of this difference did not achieve the standard threshold of 0.05 (GLM 2, Nationality × Family member: $p = 0.058$). Social discounting was also stronger, i.e., there was a greater sensitivity to social distance for family members than non-family members, indicating that the kinship premium is severely discounted as social distance increases. We found that Chinese participants were more sensitive than the French to social distance, which was driven primarily by their treatment of family members, because this difference did not hold for non-family members (GLM2 Family member: Nationality x Distance and Non-family member: Nationality × Distance). This was further supported by the finding that the triple interaction Nationality × Family member × Distance revealed a significant difference between the French and the Chinese concerning social discounting for family members with respect to non-family members. Thus, the Chinese were significantly more sensitive than the French to the social distance of family members compared to non-family members (GLM 2). Finally, the inclusion of the five components of the IND-COL scale (GLM 3), had no significant effect on the results. This suggests that these factors do not account for any significant amount of the variance of social discounting in our participants.

The better to discriminate possible marginal effects of kinship premium or IND-COL scale factors we ran GLM 4, GLM 5 and GLM 6 which were identical to GLM 1, GLM 2, and GLM 3. However, we removed the data for social distances 50 and 100. This was justified because in our experiments, family members could not be included at social distances 50 and 100. Therefore, the inclusion of the data at these social distances obscures differences in the treatment of family and non-family members (Table 6). Indeed, when this analysis was carried out a significant interaction between Nationality × Family was revealed. Thus, over the social distances at which generosity to

TABLE 5 Comparison of the parameters for each social discounting model.

		Constant sensitivity		Beta delta		Hyperbolic model	
		a	*b*	*β*	*δ*	V	k
Chinese	Mean	0.187	0.932	0.948	0.893	1.528	0.740
	SD	0.473	0.814	0.352	0.141	1.851	1.823
French	Mean	0.313	0.525	0.666	0.950	0.771	0.151
	SD	0.693	0.426	0.241	0.052	0.336	0.277
P (Mann-Whitney *U*-test)		0.057	<0.001	<0.001	0.062	<0.001	0.168

Means and standard deviations for the two parameters for each of the social discounting models. Mann-Whitney *U*-tests showed the parameter b of the constant sensitivity was significantly greater for the Chinese than the French indicating a greater sensitivity to social distance, meaning that the level of generosity of the Chinese participants falls more quickly than that of the French as social distance increases. The significantly higher levels of b in the beta-delta model suggest that Chinese have greater "added value" for recipients at the closest social distances than the French, however, this must be treated with caution because this was the worst model for the Chinese. Similarly, according to the Hyperbolic model the Chinese participants show a greater level of generosity to a theoretical recipient at social distance zero, however, this was the worst model for the French.

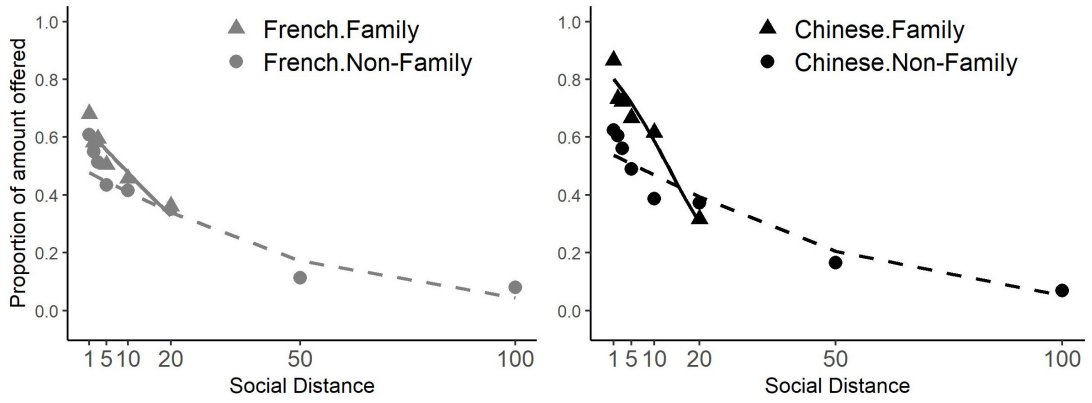

FIGURE 4
Interaction effect between group family relations and social distance on generosity at social distances 1~100. The solid lines show the proportion of the endowments offered by participants to family members, for the French (**left** graph, blue), and the Chinese (**right** graph, red) as estimated by GLM3. The dotted lines represent the proportions of the endowments offered to non-family members. The solid triangles show the mean proportions of the endowments offered to family members for the Chinese and French. The hollow dots show the mean proportions offered to non-family members. At social distances 50 and 100 the participants did not know the recipients, who could not be family members.

TABLE 6 Generalized linear models predicting social discounting behavior.

	GLM 1	GLM 2	GLM 3	GLM 4	GLM 5	GLM 6
Parameters	Marginal effects (standard errors)					
French	−0.077 (0.300)**	−0.067 (0.300)**	−0.087 (0.032)***	−0.093 (0.036)**	−0.084 (0.036)**	−0.105 (0.040)**
Endowment	<0.001 (<0.001)***	<0.001 (< 0.001)***	<0.001 (< 0.001)***	<0.001 (0.001)***	<0.001 (<0.001)***	<0.001 (< 0.001)***
Distance	−0.006 (< 0.001)***	−0.011 (< 0.001)***	−0.011 (< 0.001)***	−0.015 (0.001)***	−0.015 (0.001)***	−0.015 (0.001)***
Family member	0.126 (0.176)***	0.077 (0.016)***	0.075 (0.015)***	0.122 (0.020)***	0.119 (0.020)***	0.114 (0.020)***
French × distance		0.003 (0.001)*	0.003 (0.001)*		0.004 (0.002)*	0.004 (0.002)*
French × family member		−0.060 (0.032)	−0.039 (0.033)		−0.098 (0.041)*	−0.072 (0.042)*
Family member × distance		−0.008 (0.001)***	−0.008 (0.001)***		−0.008 (0.002)***	−0.007 (0.002)**
French × family member × distance:						
Family member: French × distance		0.007 (< 0.001)*	0.007 (0.003)*		0.007 (0.003)*	0.007 (0.003)*
Non-family member: French × distance		<0.001 (< 0.001)	<0.001 (< 0.001)		<0.001 (< 0.001)	0.001 (0.003)
CF			0.001 (0.003)			0.001 (0.005)
PA			<0.001 (<0.001)			0.001 (0.006)
PS			0.001 (0.003)			0.001 (0.004)
KN			−0.003 (< 0.001)			−0.003 (0.005)
NE			−0.003 (0.003)			−0.004 (0.003)
Number of observations	4080	4080	4000	3060	3060	3000
AIC	0.867	0.854	0.855	0.966	0.956	0.960

Marginal effects are shown in bold type, standard errors clustered at the participants' level are in parentheses; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. We included in all GLMs the following independent variables: whether the participant was French or Chinese (variable French, Chinese = 0, French = 1), the social distance (8 level values for GLMs 1, 2 and 3:, 1, 2, 3, 5, 10, 20, 50, and 100; and 6 values for GLMs 4, 5, and 6: 1, 2, 3, 5, 10, and 20), the endowment size (€80, €90, €100, €110, €120), whether the recipient was a family member or not (variable family member). GLMs 1–3 were computed using the data over social distances 1–100, while GLMs 4–6 were computed only from social distances 1–20, in order make a more accurate comparison of how the Chinese and French might differ in their treatment of family members with non-family members at the same social distances. Standard errors clustered at the participant level are in parentheses. IND-COL results were not available for two subjects who therefore were excluded from GLM3 and GLM6, which accounts for the differences in the number of observations and *p*-values for GLM 3 compared to GLM1 and GLM2 and for GLM6 compared to GLM4 and GLM5. The BOLD type indicated the within-factors.

family members can be compared with the generosity to non-family members (Social Distances 1∼20) the Chinese showed a significantly greater generosity to family than to non-family members than the French (GLM 5). This can be appreciated from the difference between the gradients of social discounting for family as opposed to non-family members for the French and the Chinese as social distance increases (Figure 4). This was the only difference observed between GLMs 1, 2, and 3 and GLMs 4, 5, and 6. Thus, there was no significant difference between the generosity of the French and the Chinese to non-family members over social distances 1∼20 (GLM 5), and no apparent effect of the IND-COL subscales (GLM 6). Thus, the greater generosity of the Chinese was, essentially, the product of a kinship premium which resulted in Chinese participants allocating a significantly greater share of the endowments to family members especially at close social distances.

Finally, we investigated whether the parameters of the models (α and *b* for the Constant Sensitivity Model, β and δ for the Beta-Delta model, and *k* and *V* for the hyperbolic model), correlated with the individual IND-COL scores on the different subscales, on the higher order factors (Ingroup Solidarity and Social Obligation) or indeed on the global IND-COL score. No significant correlations were discovered for the Chinese students with any of the models (Supplementary Tables 1, 3, 5), or for the French with the parameters of the Beta-Delta or the Hyperbolic models (Supplementary Tables 4, 6). However, for the French with the Constant Sensitivity model (Supplementary Table 2), the parameter *a* showed a significant inverse correlation with the IND-COL subscale Kin and Neighbors/susceptibility to influence. This suggests that for French students the greater their sensitivity to the influence of family and neighbors (α measure of their integrations with society), the broader they set the boundaries of their Ingroup (1/α). The parameter *b* showed significant inverse correlations with the factors Parents and Spouse/distinctiveness of personal identity, the higher order factor Ingroup Solidarity and Global IND-COL scale. Since high scores reflect greater social integration and *b* measures sensitivity to social distance, it is entirely coherent that these factors should be inversely correlated.

4. Discussion

By adopting a dictator game with real recipients at each social distance, as a paradigm of the social discounting task, our study showed that the Constant Sensitivity model best accounted for social discounting in Chinese students and the Beta-Delta model was best for the French. The Chinese showed significantly greater generosity to family members at close social distances, in agreement with the concept of a strong kinship premium. At greater social distances, there was no significant difference between the generosity of the French and the Chinese. Indeed, multivariate analysis using GLMs showed there was no significant difference between the generosity of the French and the Chinese students for non-family members at any social distance. This suggests that the relative strengths of kinship premium–rather than "cultural cohesion forces"–drives

the differences in social discounting between Chinese and French students at different social distances.

Cultural comparisons are a fruitful domain for behavioral research. Authors tend to agree that occidental cultures such as in North America and Western Europe tend to be more individualistic than those in Asia or Africa (Markus and Kitayama, 1991). In turn, Asian and African cultures are perceived to be more interdependent. The economic utility of generosity can be envisaged to be an investment in social capital such that today's generosity will be repaid in some way at some time in the future. Thus, one might expect societies characterized by greater interdependence to exhibit greater generosity across the range of social distances (Archambault et al., 2020). Several studies support this by showing that although participants from China and Japan are not more generous than occidental participants, there is less difference between their generosity at low and high social distances when compared to North Americans or Germans (Strombach et al., 2014; Ishii and Eisen, 2018). This has been taken to reflect the greater integration of Asians within their culture as a whole.

A thought provoking study compared social attitudes and social discounting in college students in the USA, workers and students in China, and nomadic tribesmen in Kenya (Boyer et al., 2012). The three groups expressed similar levels of trust with respect to their social groups (family, friends, extended family, and neighbors). The Americans and Chinese showed very similar levels of generosity to others at different social distances but the Kenyans showed very little tendency to share with anyone, including close family (Boyer et al., 2012). The authors argued that this reflected the global instability of the Kenyan tribesmen's environment where pastoral tribesmen are at the mercy of potentially devastating famines and droughts as well as aggression from neighboring tribes and intra-tribal rivalries. In such uncertain circumstances, investments in "social capital" may be unlikely to bear dividends. Similar cross cultural comparisons that have included Asian communities living in comparatively deprived environments in Indonesia and Bangladesh, have also failed to find any evidence of hyperbolic social discounting (Tiokhin et al., 2019). Instead, participants showed limited philanthropy toward other members of their communities proportional to need, rather than close social or kinship distance. These studies support that social discounting is a cultural phenomenon that is not universal and which breaks down in harsh economic conditions. However, other studies that have used social discounting tasks to assess prosocial behavior, in non-western, educated, industrialized, rich and democratic countries, reported that generosity declines across social distance, including in India (Hackman et al., 2015), Singapore (Pornpattananangkul et al., 2019), and Kenyan Massai (Archambault et al., 2020). These authors argued that the nature of the dyadic interactions, as measured by social distance, was of equal or even higher importance in these communities, because they rely on well-defined categories of social relations to allocate and access resources. Thus, they explained that the propensity for cooperation and sharing behavior varies with social distance in these societies. Individuals at close social distances are likely to directly share certain common pooled resources on a daily basis, but such day-to-day interdependencies are much less applicable with more socially remote individuals. Thus, discrepancies remain between studies to understand whether generosity depends upon social distances in different societies.

Even in the developed world and among highly educated people (e.g., university students) several issues need to be clarified with respect to social discounting. The cross-cultural studies have often used either partially or totally abstract games to compare generosity at different social distances, and have been based on binary decision choices. Therefore, we reinvestigated this issue using a non-hypothetical, non-deceptive experimental design in which the participants and recipients from their social entourage would enjoy the benefits of the participants' decisions. For greater social distances (50 and 100), the beneficiaries were anonymous and therefore, as the participants were informed, the money was donated to a charity. The participants chose freely how to divide the endowments, so their generosity could be measured precisely.

Unlike most previous studies the best models to account for the data were the Constant Sensitivity model for the Chinese students and the Beta-Delta model for the French (**Table 4** and **Figure 3**). Interestingly, in a previous study of social discounting by Chinese students the model with the lowest AIC was also found to be the Constant Sensitivity model (Strombach et al., 2014). We found the value of b, which measures the sensitivity to social distance, was significantly higher ($p < 0.001$) for the Chinese (0.932 ± 0.814) than the French (0.526 ± 0.426). This indicates that their generosity was more sensitive to social distance, which resulted in a swifter decline in generosity as social distance increased. The second parameter, a, defines the limit at which participants separate close from distant relationships. When b is greater than 1, which would appear to be the case for nearly 50% of Chinese participants, social discounting for close individuals (those at social distances less than $1/a$) occurs more slowly than when the social distance increases to greater than 1/a. This results in an initial plateau of high generosity to very close individuals. Such behavior is contrary to the hyperbolic and the beta-delta models and would explain why the constant sensitivity model is by far the best for the Chinese participants. The value of a was not significantly different between our groups of Chinese and French students, which suggests that both groups set this distance somewhere between social distance 3 and 5. Interestingly, this also corresponded to the social distance at which the Chinese students ceased to be more generous than the French, and at which both groups, but more particularly the Chinese, ceased to choose a majority of family members as recipients. This pattern is in general agreement with the concept of a kinship premium for generosity (Curry et al., 2013; Booysen et al., 2018a). At social distances greater than 5 the French designated significantly larger numbers of family members than the Chinese. It is interesting that these family members were designated outside the boundary of close social relationships, something significantly rarer for the family members of Chinese students. Moreover, our results indicated that the Chinese were significantly more generous than the French, but only at close social distances, and only to family members.

We conducted a regression analysis to explore the sources of the differences between the social discounting of the Chinese and French students. At the first level of analysis (without exploring interactions between variables), the Chinese participants were more generous than the French, participants were more generous to recipients at closer social distances, and participants were more generous to family than non-family members. However, analysis of interactions between these variables (GLM 2, GLM 5) revealed interesting differences between the giving behavior of the Chinese and French. The significant interaction between group and social distance confirmed that the Chinese were more sensitive to social distance than the French, as suggested by the comparison of the parameter b of the Constant Sensitivity model. Thus, although at close social distances the Chinese were more generous than the

French, as social distance increased, the difference in generosity decreased between the Chinese and the French. The motor for this difference appeared to be a strong effect of family membership, since the difference in generosity between the Chinese and the French did not hold for non-family members. However, the interaction between Group and Family membership, which directly compares the difference in generosity of the Chinese and French for their family members vs. non-family members at the different social distances, failed to attain significance when all social distances were included in the analysis (GLM 2). We reasoned that this result might be explained by the fact that at social distances 50 and 100 there could be no difference in the generosity of the French and Chinese between family and non-family members because no family members could be allocated to these social distances. Thus, the inclusion of these social distances in the analysis might potentially obscure a genuine effect of family vs. non-family membership between the French and Chinese. Therefore, we conducted GLMs 4, 5, and 6 in which we included only the data for social distances 1 to 20. As a result, we identified that the difference in generosity to family as opposed to non-family members, at the same social distance, was significantly greater for the Chinese than for the French, especially at the closest social distances. That is to say that the kinship premium of the Chinese is significantly larger than that of the French. Furthermore, there was no apparent difference between the generosity of the French and the Chinese for non-family members at any social distance. Interestingly, the kinship premium was especially sensitive to social distance, and even more so among the Chinese than the French participants, as shown by the results of the Nationality × Family member × distance triple interaction (GLM 2, GLM 5).

The results of the IND-COL scales seemed to predict results that were very different than those obtained for social discounting. Firstly, the scores for Ingroup Solidarity, a measure of the closeness of the relationship between the participants and their closest social elements, was not significantly different between the French and Chinese and therefore, might be expected to predict similar levels of generosity at close social distances. This idea was reinforced by the results of the three individual subscales that contribute to this higher order scale (CF, PS, and PA), none of which showed significant differences between the French and Chinese. However, in the Social Discounting experiments the Chinese were significantly more generous than the French at close social distances. The Social Obligation scale, as well as the two subscales that contribute to it (KN and NE), indicated that the Chinese were significantly more integrated and collective with more distant elements of their social entourage, and their society as a whole. This might predict that the Chinese should be expected to show higher levels of generosity at greater social distances than the French, however the Social Discounting task revealed no such differences.

In a previous study (Booysen et al., 2021), within subject correlations occurred between one of the parameters of the hyperbolic social discounting model (k) and social collectivism or individualism as measured by an IND-COL test, such that more individualistic participants were more sensitive to social distance. We therefore analyzed for correlations between the different model parameters. For the Chinese participants, no significant correlations were found. For the French, inverse correlations between parameters α and b in the Constant Sensitivity model and the scores on several of the IND-COL subscales and the Global IND-COL scores were coherent. Thus, French participants with higher scores for social integration set the limits between close and distant relationships at greater social distances from themselves (lower α) and were less sensitive to social distance (lower b). However, the results of GLM 3 and GLM 6 surprisingly showed that IND-COL subscale scores had no significant capacity to explain the variance of social discounting among the participants. There is a crucial difference between the two types of experiments. In the IND-COL scale, statements by the participant with regard to their social preferences are cost free. Similarly, in the Self-Representation task the estimation of the social distance to others in one's social entourage has no price and no payoff. In our social discounting task, the participants lose money from their own payoff in order to give money to others at each social distance. How much they are "willing to pay" to make that gift provides a real measure of the value of their generosity to that person. Many experiments on social discounting have been performed using either completely hypothetical payoffs or asymmetrical payoffs that only affected the participant, i.e., the payoffs are made to the participant but not the recipient. In such a case, when participants decide to allocate more of the endowment to a hypothetical recipient, they are essentially paying for the pleasure of making a purely hypothetical gift. A decision that *homo economicus* should reject. This may well impinge on the levels of generosity, especially at close social distances, when the cost might be proportionally higher, and hence result in lower estimations of the kinship premiums at close social distances. Perhaps it is this difference, the fact that one must pay a price to express a higher degree of social integration in the social discounting task, that accounts for the lack of correlation between the degree of social integration expressed in the IND-COL, the Self Representation task and the Social Discounting tasks.

The principal difference we found between the Chinese and French students concerns a significantly greater kinship premium for the Chinese than the French. Family and kinship are central to both the Occidental and Chinese cultures, however, it may be that the family, its stability and the importance of family relationships are greater in China than in France. This might be reflected by national statistics. The number of divorces per 100 marriages in France in 2016 was estimated at 55% (Eurostat, 2021), compared to only 3% for China (Ministry of Civil Affairs of the People's Republic of China, 2017). This is also reflected by the fact that 26% of families in France are single parent families compared to 10% in China. These data suggest that the family unit in China is indeed more stable. For example, the majority (almost 60%) of live births in France in 2016 were to unmarried parents (Eurostat, 2018), a statistic we did not find for China. This suggests that the majority of French parents no longer necessarily get married. These data all suggest that formal family relationships may be less concrete in France than China.

This impression is also reinforced by the results of our Self-Representation task. The French placed Partners (girlfriend/boyfriend) most frequently as the closest person in their entourage, with mothers second and fathers at a distant fifth position. In contrast the Chinese placed mothers and fathers similarly close at first and second positions. Although, the mean social distance at which Chinese participants placed their "partners" was not significantly greater than that of the French, they placed four other categories (mother, father, brothers and sisters, and best friend) at closer mean social distances. It is interesting that all the French participants indicated they had a partner, whereas only 45% of the Chinese did so. This might suggest that the French were including more trivial relationships as "Partners," however, the fact that on average, this was perceived as the closest relationship the participants had, suggests this was not the case.

The greater relative closeness of family members, the stability and the apparent importance of the family unit to the Chinese participants all fit well with the higher magnitude of their kinship premium. As the social distance increases, the value of this kinship premium was discounted rapidly, for both the French and the Chinese, but especially for the Chinese. Furthermore, the proportion of family members falls as social distance increases, and these combined effects result in the increased sensitivity to social distance of the Chinese compared to the French.

Data availability statement

The original contributions presented in this study are included in the article/**Supplementary material**, further inquiries can be directed to the corresponding authors.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

JL: conceptualization, methodology, formal analysis, data analysis, and writing. ED, CQ, and J-CD: conceptualization and writing. JB: data analysis and writing. BC and J-BV: writing—review and editing. ZT: conceptualization. All authors provided the critical revisions.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1087979/full#supplementary-material

References

Archambault, C., Kalenscher, T., and de Laat, J. (2020). Generosity and livelihoods: dictator game evidence on the multidimensional nature of sharing among the Kenyan Maasai. *J. Behav. Decis. Mak.* 33, 196–207. doi: 10.1002/bdm.2153

Ben-Ner, A., Kramer, A., and Levy, O. (2008). Economic and hypothetical dictator game experiments: incentive effects at the individual level. *J. Soc. Econ.* 37, 1775–1784. doi: 10.1016/j.socec.2007.11.004

Booysen, F., Guvuriro, S., and Campher, C. (2021). Horizontal and vertical individualism and collectivism and preferences for altruism: a social discounting study. *Pers. Individ. Differ.* 178:110856. doi: 10.1016/j.paid.2021.110856

Booysen, F., Guvuriro, S., Munro, A., Moloi, T., and Campher, C. (2018a). Putting a premium on altruism: a social discounting experiment with South African university students. *PLoS One* 13:e0196175. doi: 10.1371/journal.pone.0196175

Booysen, F., Munro, A., Guvuriro, S., Moloi, T., and Campher, C. (2018b). Incentivising the social discounting task: a laboratory experiment. *S. Afr. J. Econ.* 86, 153–172. doi: 10.1111/saje.12191

Boyer, P., Lienard, P., and Xu, J. (2012). Cultural differences in investing in others and in the future: why measuring trust is not enough. *PLoS One* 7:e40750. doi: 10.1371/journal.pone.0040750

Bühren, C., and Kundt, T. C. (2015). Imagine being a nice guy: a note on hypothetical vs. incentivized social preferences. *Judg. Decis. Mak.* 10, 185–190. doi: 10.1017/S1930297500003946

Curry, O., Roberts, S. G., and Dunbar, R. I. (2013). Altruism in social networks: evidence for a 'kinship premium'. *Br. J. Psychol.* 104, 283–295. doi: 10.1111/j.2044-8295.2012.02119.x

Darlington, P. J. (1978). Altruism: its characteristics and evolution. *Proc. Natl. Acad. Sci. U.S.A.* 75, 385–389. doi: 10.1073/pnas.75.1.385

Ebert, J. E. J., and Prelec, D. (2007). The fragility of time: time-insensitivity and valuation of the near and far future. *Manag. Sci.* 53, 1423–1438. doi: 10.1287/mnsc.1060.0671

Eurostat, (2018). *Are More Babies Born Inside or Outside Marriage?* Available online at: https://ec.europa.eu/eurostat/fr/web/products-eurostat-news/-/ddn-20180416-1 (accessed September, 2021).

Eurostat (2021). *Divorce Indicators*. Available online at: https://ec.europa.eu/eurostat/databrowser/view/demo_ndivind/default/table?lang=en (accessed September, 2021).

Forsythe, R., Horowitz, J. L., Savin, N. E., and Sefton, M. (1994). Fairness in simple bargaining experiments. *Games Econ. Behav.* 6, 347–369. doi: 10.1006/game.1994.1021

Hackman, J., Danvers, A., and Hruschka, D. J. (2015). Closeness is enough for friends, but not mates or kin: mate and kinship premiums in India and U.S. *Evol. Hum. Behav.* 36, 137–145. doi: 10.1016/j.evolhumbehav.2014.10.002

Hofstede, G. (1980b). Culture and organizations. *Int. Stud. Manag. Organ.* 10, 15–41. doi: 10.1080/00208825.1980.11656300

Hofstede, G. (1980a). Motivation, leadership, and organization: do American theories apply abroad? *Organ. Dyn.* 9, 42–63. doi: 10.1016/0090-2616(80)90013-3

Hofstede, G. (1984). *Culture's Consequences: International Differences in Work-Related values. (Vol. 5)*. Thousand Oaks, CA: Sage.

Hui, C. H., Triandis, H. C., and Yee, C. (1991). Cultural differences in reward allocation: is collectivism the explanation? *Br. J. Soc. Psychol.* 30, 145–157. doi: 10.1111/j.2044-8309.1991.tb00931.x

Hui, H. C., and Yee, C. (1994). The shortened lndividualism-collectivism scale: its relationship to demographic and work-related variables. *J. Res. Pers.* 28, 409–424. doi: 10.1006/jrpe.1994.1029

Ishii, K., and Eisen, C. (2018). Cultural similarities and differences in social discounting: the mediating role of harmony-seeking. *Front. Psychol.* 9:1426. doi: 10.3389/fpsyg.2018.01426

Ito, M., Saeki, D., and Green, L. (2011). Sharing, discounting, and selfishness: a Japanese-american comparison. *Psychol. Record* 61, 59–76. doi: 10.1007/BF03395746

Jones, B., and Rachlin, H. (2006). Social discounting. *Psychol. Sci.* 17, 283–286. doi: 10.1111/j.1467-9280.2006.01699.x

Jones, B. A., and Rachlin, H. (2009). Delay, probability, and social discounting in a public goods game. *J. Exp. Anal. Behav.* 91, 61–73. doi: 10.1901/jeab.2009.91-61

Kitayama, S., and Uskul, A. K. (2011). Culture, mind, and the brain: current evidence and future directions. *Annu. Rev. Psychol.* 62, 419–449. doi: 10.1146/annurev-psych-120709-145357

Laibson, D. (1997). Golden eggs and hyperbolic discounting. *Q. J. Econ.* 112, 443–478. doi: 10.1162/003355397555253

Leung, K., and Iwawaki, S. (1988). Cultural collectivism and distributive behavior. *J. Cross-Cult. Psychol.* 19, 35–49. doi: 10.1177/002200218801900103

Markus, H. R., and Kitayama, S. (1991). Culture and the self: implications for cognition, emotion, and motivation. *Psychol. Rev.* 98, 224–253. doi: 10.1037/0033-295X.98.2.224

Ministry of Civil Affairs of the People's Republic of China (2017). *2016年社会服务发展统计公报*. Available online at: http://www.mca.gov.cn/article/sj/tjgb/201708/20170815005382.shtml (accessed September, 2021).

Nash, J. C. (2012). *Package 'nlmrt.' R Package Version*.

Oyserman, D., Coon, H. M., and Kemmelmeier, M. (2002). Rethinking individualism and collectivism: evaluation of theoretical assumptions and meta-analyses. *Psychol. Bull.* 128, 3–72. doi: 10.1037/0033-2909.128.1.3

Pollet, T. V., Roberts, S. G., and Dunbar, R. I. (2013). Going that extra mile: individuals travel further to maintain face-to-face contact with highly related kin than with less related kin. *PLoS One* 8:e53929. doi: 10.1371/journal.pone.0053929

Pornpattananangkul, N., Chowdhury, A., Feng, L., and Yu, R. (2019). Social discounting in the elderly: senior citizens are good samaritans to strangers. *J. Gerontol B Psychol. Sci. Soc. Sci.* 74, 52–58. doi: 10.1093/geronb/gbx040

Rachlin, H., and Jones, B. A. (2008). Altruism among relatives and non-relatives. *Behav. Process.* 79, 120–123. doi: 10.1016/j.beproc.2008.06.002

Rachlin, H., Raineri, A., and Cross, D. (1991). Subjective probability and delay. *J. Exp. Anal. Behav.* 55, 233–244.

Romanowich, P., and Igaki, T. (2017). Effects of reward magnitude, alcohol and cigarette use on social discounting in Japan and United States college students. *Psychol. Record* 67, 345–353. doi: 10.1007/s40732-017-0218-3

Stegall, S. E., Collette, T., Kinjo, T., Takahashi, T., and Romanowich, P. (2019). Quantitative cross-cultural similarities and differences in social discounting for gains and losses. *Front. Public Health*. 7:297. doi: 10.3389/fpubh.2019.00297

Strang, S., Gerhardt, H., Marsh, N., Oroz Artigas, S., Hu, Y., Hurlemann, R., et al. (2017). A matter of distance-the effect of oxytocin on social discounting is empathy-dependent. *Psychoneuroendocrinology* 78, 229–232. doi: 10.1016/j.psyneuen.2017.01.031

Strombach, T., Jin, J., Weber, B., Kenning, P., Shen, Q., Ma, Q., et al. (2014). Charity begins at home: cultural differences in social discounting and generosity. *J. Behav. Decis. Mak.* 27, 235–245. doi: 10.1002/bdm.1802

Tiokhin, L., Hackman, J., Munira, S., Jesmin, K., and Hruschka, D. (2019). Generalizability is not optional: insights from a cross-cultural study of social discounting. *R. Soc. Open Sci.* 6:181386. doi: 10.1098/rsos.181386

Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychol. Rev.* 96, 506–520. doi: 10.1037/0033-295X.96.3.506

Wu, Y., Leliveld, M. C., and Zhou, X. (2011). Social distance modulates recipient's fairness consideration in the dictator game: an ERP study. *Biol. Psychol.* 88, 253–262. doi: 10.1016/j.biopsycho.2011.08.009

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Unraveling Chinese talk about emotion

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Research in cross-cultural psychiatry has asserted that Chinese people have a higher tendency to report somatic symptoms of their psychological distress than people with a European ethnic background. However, recent studies have reached inconsistent conclusions and most have confounded language use with culture in their study designs. Focusing on the varying degrees of orientation to Chinese culture, the present study examined the words freely listed by two Chinese groups of university students (mainland Chinese and Hong Kong Chinese) when describing their illness experience. Words were categorized into somatic, emotion, and somatic–emotion clusters. Overall, the Chinese participants were more willing to talk about their emotions than their somatic symptoms in an anonymous survey. The enculturated mainland Chinese participants—who reported greater Chinese cultural identity—used significantly more emotion words but fewer somatic–emotion words than the Hong Kong Chinese participants. No group differences were found in somatic words. In contrast to previous findings, the current study failed to find support for the relationship between orientation to Chinese culture and somatic symptom reporting when controlling for language use.

KEYWORDS

somatization, somatic symptom reporting, psychologization, emotion talk, Chinese culture

Introduction

> "Chinese are culturally trained to 'listen' within their body" (Ots, 1990, p. 26).

In the 1980s, the low prevalence of depression in Chinese communities caught the attention of researchers in cross-cultural psychiatry (Kleinman, 1986; see also Russell and Yik, 1996; Parker et al., 2001). Four decades later, an epidemiological study reported the lifetime prevalence of major depressive disorder as 3.4% in China (Huang et al., 2019), in comparison with 20.6% in the United States (Hasin et al., 2018) and 12.8% in Europe (Alonso et al., 2004). The data suggest that the community prevalence of depression among the Chinese population remains comparatively low. The rarity of depression among Chinese people is an area of active investigation (Yik, 2010), and somatization, the focus of the current study, has been offered as one possible explanation.

The low prevalence rates of depression may be partly due to the difficulties in defining and diagnosing depression in Chinese culture. In a seminal study, Kleinman (1982; see also Lee, 1999) found that neurasthenia, which emphasizes somatic symptoms such as fatigue, insomnia, and muscle pain, was a frequently used diagnosis in China (Ryder and Chentsova-Dutton, 2012). Kleinman found that Chinese patients diagnosed with neurasthenia could be re-diagnosed as having some level of depression using the Diagnostic and Statistical Manual of Mental

Disorders III. Kleinman argued that neurasthenia is a potential somatic presentation of depression, which may account for the low rates of diagnosed depression in China during the 1980s (see also Ryder et al., 2008).

Although somatization appears to be a common phenomenon in Chinese communities and is not restricted to people with depression, some researchers have found that Chinese subjects are not alone in reporting somatic complaints. Parker et al. (2001) found that although a larger portion of Malaysian Chinese outpatients, compared with Euro-Australian outpatients, nominated a somatic symptom as their primary complaint (60% vs. 13%), neither group showed an exclusively emotion or somatic symptom profile. Ryder et al. (2008) found no differences between Chinese and Euro-Canadian outpatients in reporting somatic symptoms when privately responding to a questionnaire. When focusing on the individual items (rather than the scales composed of these items), Dere et al. (2013) found that their Chinese subjects reported high levels of affective symptoms, such as "suppressed emotions" and "depressed mood," and spontaneously reported "depressed mood" at a level comparable to their Euro-Canadian counterparts.

Taken together, past studies have drawn inconsistent conclusions on the somatization phenomenon among Chinese people. Moreover, as most studies have compared one monolingual-monocultural group with another (e.g., Mandarin-speaking Chinese vs. English-speaking Canadians), language use has tended to be confounded with cultural background when testing somatic symptom reporting (see Kirmayer and Young, 1998). To assess the independent effect of culture on verbal expressions of illness experience, the present study recruited two Chinese samples that varied in their degrees of orientation to Chinese culture but used the same (Chinese) language.

Conceptualizing somatization

> "Emotions are thoughts somehow 'felt' in flushes, pulses, 'movement' of livers, minds, hearts, stomachs, skin" (Rosaldo, 1984, p. 143).

The notion of a close connection between emotions and somatic changes is not new in the literature. James (1884) was among the first batch of psychologists to propose that different emotions are associated with specific patterns of autonomic nervous system changes. Phrased differently, an emotional state can be shown via a pattern of physiological changes (Mauss and Robinson, 2009). The two-factor arousal theory also emphasizes the importance of physiology in the experience of emotion (Schachter and Singer, 1962).

Traditionally, somatization is a term tied to the psychodynamic notion that internal psychological conflict transforms into bodily distress (see Kirmayer, 1984; Lipowski, 1988). Some theorists have argued that somatization might be an outcome of the mind–body dualism inherent in a European ideology of medicine (Kirmayer and Young, 1998). From this dualist perspective, psychiatric disorders are seen as purely mental in nature and other medical conditions as physical (psychologization vs. somatization). Drawing on their random sample of 2,246 residents in a Canadian urban multicultural milieu, Kirmayer and Young (1998) concluded that somatization was ubiquitous in all cultural groups, although its prevalence and manifestation varied across cultures.

In recent research, somatization has been conceptualized in at least four different ways and its usage is often ambiguous. First, it has been regarded as the denial of psychological symptoms and substitution of somatic symptoms (Lipowski, 1988; Draguns, 1996; see also Parker et al., 2001). Second, it has been interpreted as "somatosensory amplification," with the intense experience of bodily sensations giving rise to an emphasis on somatic symptoms (Zhou et al., 2011; see also Mak and Zane, 2004). Third, somatization has been defined as the presentation of somatic symptoms by people with psychiatric disorders (Simon et al., 1999; see also Tsai et al., 2004). Fourth, it has been portrayed as a form of help-seeking behavior through which people with somatic complaints are able to secure healthcare resources (Yen et al., 2000; Dere et al., 2013) or empathy.

Somatization in Chinese culture

> "Men can shed blood but not tears."—Old Chinese saying.

The close connection between emotion and illness is still evident in everyday life in Chinese communities. An appointment with a Chinese doctor regarding a high blood pressure reading could result in a diagnosis of it being a symptom of stress, anxiety, or mood fluctuations. In this case, emotion is the cause of the high blood pressure, which is the somatic manifestation of stress or anxiety. Another classic example is *shenjing shuairuo* (neurasthenia), which is viewed as a somatic manifestation of depression associated with fatigue, insomnia, and muscle pain (Kleinman, 1982). The etiology of somatization can be traced back to ancient writings and medical practices in China (Kirmayer and Young, 1998; see also Yik, 2010).

The *Huangti Neiching* (The Yellow Emperor's Classic of Internal Medicine; Veith, 1972), a compilation of ancient Chinese medical texts, applied the balance theory of emotion to the treatment of diseases. Somatic symptoms were diagnosed according to the affected organ from which the problematic emotion could be inferred. Extreme emotions were hypothesized to induce diseases (see Klineberg, 1938; Wu, 1982; Leung, 1998; Park and Hinton, 2002). In the *Neiching*, five emotions were mapped precisely onto five organs: anger was injurious to the liver, joy to the heart, worry to the lungs, fear to the kidneys, and contemplation to the spleen. If a patient had problems in these organs, the illness was thought to trigger excessive emotion, causing pain in other parts of the body (Saint Arnault, 2009) and thus worsening the patient's overall health condition. In an investigation of the correspondence between emotions and bodily complaints in psychosomatic disorders at the Jiangsu Provincial Hospital, Ots (1990) found that patients tended to arrive with somatic complaints and that doctors avoided psychological diagnoses to prevent stigma. In fact, both parties preferred a somatic idiom based on the understanding that emotions lead to illness.

The close relationship between emotion and its somatic concomitants has been well documented in Chinese writing. Many

emotion-related Chinese characters (ideographs) include a "heart" radical (see Russell and Yik, 1996). Tung (1994) found that many Chinese characters are rooted in the body, thereby accounting for the high prevalence of somatization among the Chinese. King (1989) investigated the ways in which Chinese people conceptualized emotions and concluded that metonymies—a part standing for the whole (e.g., smiling for happiness, crying for sadness)—play a significant role in the Chinese manifestation of the five emotion concepts. Relatedly, King found that *qi*, the energy flowing throughout all parts of the body, was highly related to emotion. In the *Neiching*, the relationship between emotion and qi was mapped carefully (e.g., anger makes qi rise; fright makes qi become chaotic). The emphasis on somatic symptoms, such as crying and pain in sadness, and the importance of qi in defining emotion are consistent with the phenomenon of somatization.

Acculturation and somatization

The evidence presented thus far seems to suggest Chinese culture as a possible explanatory variable for the high prevalence of somatization. "Culture" can be broadly defined as a shared meaning system that includes values, rituals, beliefs, and language (Kroeber and Kluckhohn, 1952). Recent studies have focused on the relationship between acculturation and somatization. Acculturation is the process of psychological and cultural change that takes place as a consequence of interaction between cultural groups (Berry, 2005). For instance, a Chinese subject moving to the United States might become acculturated to the host culture by learning its values and rituals.

In their community sample of 1,747 Chinese immigrants in the United States, Mak and Zane (2004) failed to find support for a relationship between somatization and acculturation to U.S. culture. The immigrants' somatization scores were instead correlated positively with age, distress severity, and psychosocial stress, and negatively with education levels and sources of social support (see Beirens and Fontaine, 2011). Similarly, in a community sample in Australia, Parker et al. (2005) found that Chinese subjects acculturated to Australian culture reported depressive episodes at a comparable level to that of a control group of matched non-Chinese. Yen et al. (2000) found that Chinese students endorsed lower levels of somatic depressive symptoms than Chinese subjects who identified with U.S. culture and U.S. subjects of European ethnic origins. Their Chinese subjects, when they sought counseling, somatized when they were in China but not when they were in the United States.

Tsai et al. (2004) evaluated how participants with varying degrees of acculturation to U.S. culture differed in their word use when describing their childhood experiences and conflicts in their romantic relationships. The results showed that the less acculturated (to U.S. culture) Chinese group used more somatic and social words than did the U.S. participants of European ethnic origins. The authors contended that the use of somatic words may have been related to the participants' levels of acculturation to Chinese culture. The U.S. participants of European ethnic origins, however, did not use more emotion words than did their Chinese counterparts who were acculturated to U.S. culture.

Ryder et al. (2008) studied Chinese outpatients in China and Canadian outpatients of European ethnic origins in Canada using three modalities: spontaneous reports and clinical interviews completed by clinicians, and self-report questionnaires completed by the participants. The Chinese patients reported more somatic symptoms than the Canadian patients of European ethnic origins only when interviewed by (unfamiliar) clinicians (Dere et al., 2013; see also Zheng et al., 1986). In contrast, the psychologization effect (use of psychological symptoms) among the Canadians of European ethnic origins was evident in all three assessment methods. The authors concluded that European or North American psychologization, rather than Chinese somatization, was a culturally unique phenomenon (Kirmayer and Young, 1998).

In summary, the evidence attesting to the relationship between somatization and Chinese culture is mixed. Chinese participants appear to have a higher tendency than their counterparts of European ethnic origins to somatize when interviewed by clinicians, but they are less consistent in their somatization tendency when reporting symptoms in an anonymous survey. To further complicate the picture, most studies have adopted a monocultural-monolingual design (for an exception, see Tsai et al., 2004). As such, group differences could be explained by culture and/or language use.

The present study

In the present study, we sought to disentangle the effects of culture and language use on somatization by recruiting mainland Chinese (MC) and Hong Kong Chinese (HKC) participants. Given that both MC and HKC are of Chinese origin, our method focuses on enculturation, which refers to the acquisition of the values, beliefs, behaviors, and social norms of one's own culture (Kim, 2007). HKC, having undergone years of British influence, have been found to be more bicultural and less oriented to Chinese culture than the relatively monocultural MC (Ng and Lai, 2011). We hypothesized that the MC group would attain higher scores in orientation to Chinese culture than the HKC group (Hypothesis 1) and that the MC group would use more somatic words but fewer emotion words than the HKC group (Hypothesis 2).

Method

Participants

Two groups of undergraduate students studying at a university in Hong Kong were recruited *via* email and an announcement made on the SONA system. For the HKC (MC) group, we asked for volunteers who were born in Hong Kong (mainland China) and had lived there for most of their lives. The sample characteristics of the participants are presented in Table 1. On average, the HKC group ($N = 82$; 42 females; $M_{age} = 21$) had lived in Hong Kong for 20 years ($SD = 2.38$) and all listed Cantonese as their first and strongest language; the MC group ($N = 70$; 33 females; $M_{age} = 20$) had lived in mainland China for 17 years ($SD = 3.10$) and two thirds of them listed Mandarin as their first and strongest language.

TABLE 1 Sample demographics.

Variable	Hong Kong Chinese ($n = 82$)	Mainland Chinese ($n = 70$)
Age (in years)	$M = 21$ ($SD = 1.73$)	$M = 20$ ($SD = 1.63$)
Female	51%	47%
Place of birth		
Hong Kong	86.60%	7.10%
Mainland China	8.50%	91.40%
Other	4.90%	1.40%
Number of years living in		
Hong Kong	$M = 20$ years ($SD = 2.38$)	--
Mainland China	--	$M = 17$ years ($SD = 3.10$)
Mother tongue		
Cantonese	100.00%	28.60%
Mandarin	--	65.70%
Other	--	5.70%
Strongest language		
Cantonese	100.00%	27.10%
Mandarin	--	67.10%
Other	--	5.70%
Self-perceived health status[a]	$M = 2.12$ ($SD = 0.53$)	$M = 2.17$ ($SD = 0.54$)
Orientation to Chinese culture[b]	$M = 3.77$ ($SD = 0.43$)	$M = 4.14$ ($SD = 0.42$)
Cultural identity[b]	$M = 3.43$ ($SD = 0.48$)	$M = 3.99$ ($SD = 0.50$)
Language proficiency[b]	$M = 4.43$ ($SD = 0.51$)	$M = 4.44$; ($SD = 0.49$)

[a]Possible scores range from 0 to 3. [b]Possible scores range from 1 to 5.

Measures and procedure

A traditional Chinese version of the questionnaire and Cantonese instructions were used in the sessions for the HKC group; a simplified Chinese version and Mandarin instructions were used for the MC group.

A recent illness episode

Following the procedure used by Tsai et al. (2004), the participants were asked to recall a recent illness episode and were guided to relive the experience by indicating *when* they fell ill, *where* they were at that time, and *how long* the illness lasted. Recalling such an episode provided an opportunity for the participants to express both emotional distress and physical complaints. They were then instructed to list up to 10 words to describe their experience. On average, each participant listed seven words ($SD = 2$).

Orientation to Chinese culture

To measure the participants' orientation to Chinese culture, 15 items were adopted from the abridged version (for Chinese) of the General Ethnicity Questionnaire (GEQC; Tsai et al., 2000). These items were translated into Chinese using the back-translation procedure. The GEQC was designed to test Chinese Americans' acculturation to Chinese culture. We chose the 15 items that bore face validity for measuring enculturation to Chinese culture among our participants. Of the 15 items, 10 measured Chinese cultural identity ($\alpha = 0.80$),[1] with responses made on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The remaining five items measured Chinese language proficiency ($\alpha = 0.59$),[2] with responses made on a 5-point Likert scale ranging from 1 (*at least*) to 5 (*at most*). Higher scores indicated greater orientation to Chinese culture.

Self-reported health status

Because Mak and Zane (2004) found that participants who somatized their psychosocial distress tended to have a poorer self-perceived health status, we measured and compared the health status between the two Chinese samples in the present study using the Chinese version of Goldberg's (1978) General Health Questionnaire (GHQ-60; $\alpha = 0.94$; see Chan, 1985). Our two groups did not differ in their perceived health status, $F(1, 150) = 0.003$, $MSE = 463.223$, $p = 0.957$. An additional analysis showed that there was no significant main effect or interaction effect involving gender.

Results

Enculturation to Chinese culture

An ANOVA was conducted to test whether there was a difference in the orientation to Chinese culture between the MC and HKC groups. The orientation to Chinese culture was stronger in the MC group ($M = 4.14$, $SD = 0.42$) than in the HKC group ($M = 3.77$, $SD = 0.43$), $F(1, 150) = 29.345$, $MSE = 0.181$, $p < 0.001$. There was a significant difference on the Chinese cultural identity subscale, $F(1, 150) = 48.643$, $MSE = 0.239$, $p < 0.001$, but not in the Chinese language proficiency subscale, $F(1, 50) = 0.038$, $MSE = 0.252$, $p = 0.845$. Additional analyses revealed no significant main effects or interactions involving gender. Consistent with Hypothesis 1, the MC participants had a stronger orientation to Chinese culture (*viz.* Chinese cultural identity) than did their HKC counterparts.

Data reduction in word use

From our sample of 152 participants (82 HKC, 70 MC), we obtained 1,049 responses in total. To assess the word use, we used

1 The 10 items were (1) When I was growing up, I was exposed to Chinese culture. (2) Now, I am exposed to Chinese culture. (3) Compared to how much I negatively criticize other cultures, I criticize Chinese culture less. (4) I am embarrassed/ashamed of Chinese culture. (5) I am proud of Chinese culture. (6) Chinese culture has had a positive impact on my life. (7) I am familiar with Chinese cultural practices and customs. (8) I listen to Chinese music. (9) I celebrate Chinese holidays. (10) Overall, I am Chinese.

2 The five items were (1) How much do you speak Chinese at home? (2) How much do you speak Chinese at school? (3) How much do you speak Chinese with friends? (4) How much do you view, read, or listen to Chinese on TV? (5) How much do you view, read, or listen to Chinese in literature?

a bottom-up approach to code these spontaneous responses in Chinese (see Widen et al., 2011).

Step 1

Identical responses were grouped together. For example, all examples of the Chinese term *pijuan* (tired and sleepy) were grouped together and counted as one. However, terms such as *hen pijuan* (very tired and sleepy) were not grouped with pijuan (tired and sleepy) as the two terms are not identical. In this step, 510 unique responses were identified.

Step 2

Two coders categorized the 510 unique responses into groups. Two responses were put into the same group if they had identical core morphemes with the same lexical meaning or if they were synonyms in most contexts. For example, units such as pijuan (tired and sleepy) and hen pijuan (very tired and sleepy) were grouped together because they both have the core morphemes *pi* (tired) and *juan* (sleepy), representing the same lexical meaning, "tired and sleepy"; units such as pijuan (tired and sleepy) and *pibei* (tired and sleepy) were grouped together as they are synonyms that can be used interchangeably in most contexts. Disagreements in coding were resolved through discussion between the coders. In this step, 323 syntactic groups were identified.

Step 3

The 323 groups were further categorized into seven mutually exclusive clusters (i.e., each group could be assigned to one cluster only), which are presented in Table 2. Groups were clustered together only when they described the same type of state or process. For example, both the pijuan (tired and sleepy) group (e.g., pijuan, hen pijuan, and pibei), and the *toutong* (headache) group were placed in the "somatic" cluster because they described the participants' physical states, whereas the *jiaolv* (anxious) group was placed in the "emotion" cluster (see Clore et al., 1987; Tsai et al., 2004). A "somatic–emotion" category was created to capture words that could be used to describe either somatic or emotion states depending on the context. For instance, *nanshou* (suffered) could mean "suffering physically" in a context such as *shenti nanshou* (feeling physically ill) and "suffering psychologically" in a context such as *xinli nanshou* (feeling miserable).

All the data were coded into the seven word categories by the two coders independently. There was moderate agreement between the two coders' categorizations, $\kappa = 0.60$ (95% CI [0.56, 0.63]), $p < 0.001$. We confirmed the final categorization after discussing the discrepancies. In tallying the responses, 80% were captured by the somatic, emotion, and somatic–emotion clusters in each sample. In both samples, the modal cluster was emotion. Paired *t*-tests revealed that both groups had a higher tendency to use emotion words than somatic words. Among the HKC participants, the percentage of emotion words ($M = 39$, $SD = 26.87$) was higher than the percentage of somatic words ($M = 22$, $SD = 24.03$), $t(81) = 3.25$, $p < 0.01$. Among the MC participants, the percentage of emotion words ($M = 52$, $SD = 30.00$) was higher than the proportion of somatic words ($M = 17$, $SD = 20.90$), $t(81) = 6.11$, $p < 0.01$. Contrary to past findings, our two Chinese groups did not emphasize more somatic terms than emotion terms in describing their illness experience.

Variations in word use

In this section, we report on our test of whether there were differences in word use between the MC group and the HKC group when describing their illness (Hypothesis 2). We limited our analyses to the clusters of somatic words, emotion words, and somatic–emotion words. For each participant, we tallied the number of words categorized in each cluster and the total number of words listed. The proportion for each cluster was estimated and used as the dependent variable in subsequent analyses.

We first tested the relationship between the participants' orientation to Chinese culture and word use when reporting their recent illness episodes. As shown in Table 3, the subscale of cultural identity was most strongly associated with word use: it was positively related to emotion words but negatively related to both somatic and somatic–emotion words. Chinese language proficiency was positively correlated with emotion words.

We then conducted a series of ANOVAs on the word clusters. An ANOVA conducted on somatic words revealed no significant effect of Group, $F(1, 150) = 1.836$, $MSE = 0.510$, $p = 0.177$, although the HKC group had a higher tendency to use somatic words. A second ANOVA conducted on emotion words revealed that the main effect of Group, $F(1, 150) = 8.036$, $MSE = 0.080$, $p = 0.005$, was significant. The MC group used significantly more emotion words than the HKC group. A third ANOVA conducted on somatic–emotion words also revealed a significant main effect of Group, $F(1, 150) = 10.044$, $MSE = 0.022$, $p = 0.002$. The HKC group used significantly more somatic–emotion words than the MC group. Additional analyses were conducted to explore whether the group differences varied across gender and found that there were no significant main effects or interactions involving gender. The results are displayed in Figure 1. Contrary to Hypothesis 2, the (more enculturated) MC group did not use more somatic words or fewer emotion words than the (less enculturated) HKC group.

Discussion

To better understand the conflicting findings on somatization and culture in the literature, we studied the words used by two Chinese groups with varying degrees of enculturation to Chinese culture (but with the same language) when discussing illness episodes. We found that both groups used emotion and somatic terms when describing their illness episodes and that both groups used more emotion terms than somatic terms. In contrast to our hypothesis and past findings, the (more enculturated) MC participants used more emotion terms and the (less enculturated) HKC used more somatic–emotion terms. No differences were found in the somatic terms.

Somatization among Chinese people

We used a bottom-up approach in coding the open-ended responses. We created a cluster named "somatic–emotion" to categorize words that could be used to describe either somatic or emotional states (e.g., suffering, unwell) depending on the context. Past research has either lacked such a cluster or put these words under an "ambiguous" set (Ryder et al., 2008). A careful examination revealed that each somatic–emotion word could be interpreted as an

TABLE 2 Clusters of words for describing experience during a recent illness episode.

Cluster	Definition	% HKC	Examples for HKC group	% MC	Examples for MC group
1. Somatic	Describe sensory and perceptual processes as well as physical states and functions	22.56%	*lei* (tired), *pijuan* (tired and sleepy), *fali* (lacking strength), *toutong* (headache), *keshui* (sleepy)	17.78%	*pijuan* (tired and sleepy), *fali* (lacking strength), *lei* (tired), *teng* (aching), *mei weikou* (lacking appetite)
2. Emotion	Describe emotion states only	37.55%	*wuzhu* (helpless), *bu'an* (restless), *wunai* (speechless), *nanguo* (sad), *danyou* (worried)	49.49%	*wuzhu* (helpless), *danyou* (worried), *jiaoji* (tense), *haipa* (fearful), *gudu* (lonely)
3. Somatic–emotion	Describe either somatic or emotion states	19.31%	*xinku* (distressed), *tongku* (painfully distressed), *nanshou* (suffering), *bushi* (unwell), *mei jingshen* (lacking energy and spirit)	13.54%	*tongku* (painfully distressed), *nanshou* (suffering), *xinku* (distressed), *bushi* (unwell), *mei jingshen* (lacking energy and spirit)
4. Action tendency	Describe thinking process before taking actions	7.76%	*kewang binghao* (longing for recovery), *qidai* (expectant), *xiang gongzuo* (want to work), *xiang xiuxi* (want to rest), *buxiang shuohua* (do not want to talk)	7.47%	*hulue* (ignore), *qidai* (expectant), *kewang binghao* (longing for recovery), *xiang xiuxi* (want to rest), *shunqi ziran* (let it be)
5. Action	Describe actions taken	5.96%	*xiuxi* (rest), *chiyao* (take medicine), *shuijiao* (sleep), *heshui* (drink water), *gan project* (work)	3.43%	*deng* (wait), *qukan clinic* (go to clinic), *shuijiao* (sleep), *anwei* (comfort), *kan yisheng* (see the doctor)
6. General statements	Describe general states and external conditions	5.42%	*bei zhaogu* (be taken care of), *dai* (lethargic), *naodai kongbai* (blank mind), *bei guanxin* (be shown care and concern), *bingqing haozhuan* (illness condition improved)	5.66%	*bei zhaogu* (be taken care of), *jianqiang* (adamant), *xiguan* (get used to), *haozhuan* (condition improved), *nan'ao* (tough)
7. Others	Words that do not belong to any of the other categories	1.44%	*anggui* (expensive), *baizhou* (porridge), *taiwan* (Taiwan), *shenjing* (nerve), *shui* (water)	2.63%	*beizi* (quilt), *hongtangshui* (brown sugar water), *jiaren* (family), *jiaobu* (bandage), *jiaoluo* (a corner)

The total number of responses from the HKC group was 554 and from the MC group was 495.

TABLE 3 Correlations between word use and other explanatory variables ($N = 152$).

Word Cluster	Orientation to Chinese culture	Cultural identity	Chinese language proficiency
Somatic	−0.18*	−0.19*	−0.08
Emotion	0.24**	0.23**	0.16*
Somatic–emotion	−0.16	−0.20*	0.01

*$p < 0.05$, two-tailed. **$p < 0.01$, two-tailed.

integration of both somatic and emotion states. These words might provide an excellent window through which to unravel the somatization phenomenon. As this was the first time this cluster has been used in somatization studies, future research should be conducted to further investigate how useful these words may be for characterizing Chinese people's verbal expression of emotions.

When reporting their experience of a recent illness, the (less enculturated) HKC participants used more somatic–emotion words. These words illustrate the traditional Chinese medical principles of focusing on symptom clusters that are each composed of somatic and emotion symptoms. We suspect that the HKC participants, although less oriented to Chinese culture, might still be prone to the influence of traditional Chinese medicine, which is widely practiced in both mainland China and Hong Kong (Lee, 1980; Hesketh and Zhu, 1997). Kleinman (1986) made a similar argument that somatization reflected the principle of traditional Chinese medicine. Chinese participants whose somatic states were conceptually closely associated with their emotion states tended to use more somatic words (or somatic–emotion words in the present study), even if they identified less with Chinese culture in general. In future studies, belief in traditional Chinese medicine can be examined as another explanatory variable to shed light on Chinese somatization.

Somatization–psychologization dichotomy

In the 1980s, anthropologists and other social scientists asserted that somatization and culture were closely related. People who were more oriented to Chinese culture were said to report more somatic symptoms. During the subsequent four decades of extensive theoretical speculations and mostly monolingual-monocultural studies, somatization has been found to be related to many factors, such as acculturation, stress and anxiety, thinking style, and help-seeking behaviors.

In the present study, Chinese participants used twice as many emotion words as somatic words when describing an illness episode. The mainland Chinese participants—who highly identified with Chinese culture—preferred using emotion words to somatic words (49% vs. 18%). Echoing the conclusion of Ryder et al. (2008), researchers have perhaps spent too much time dichotomizing Chinese

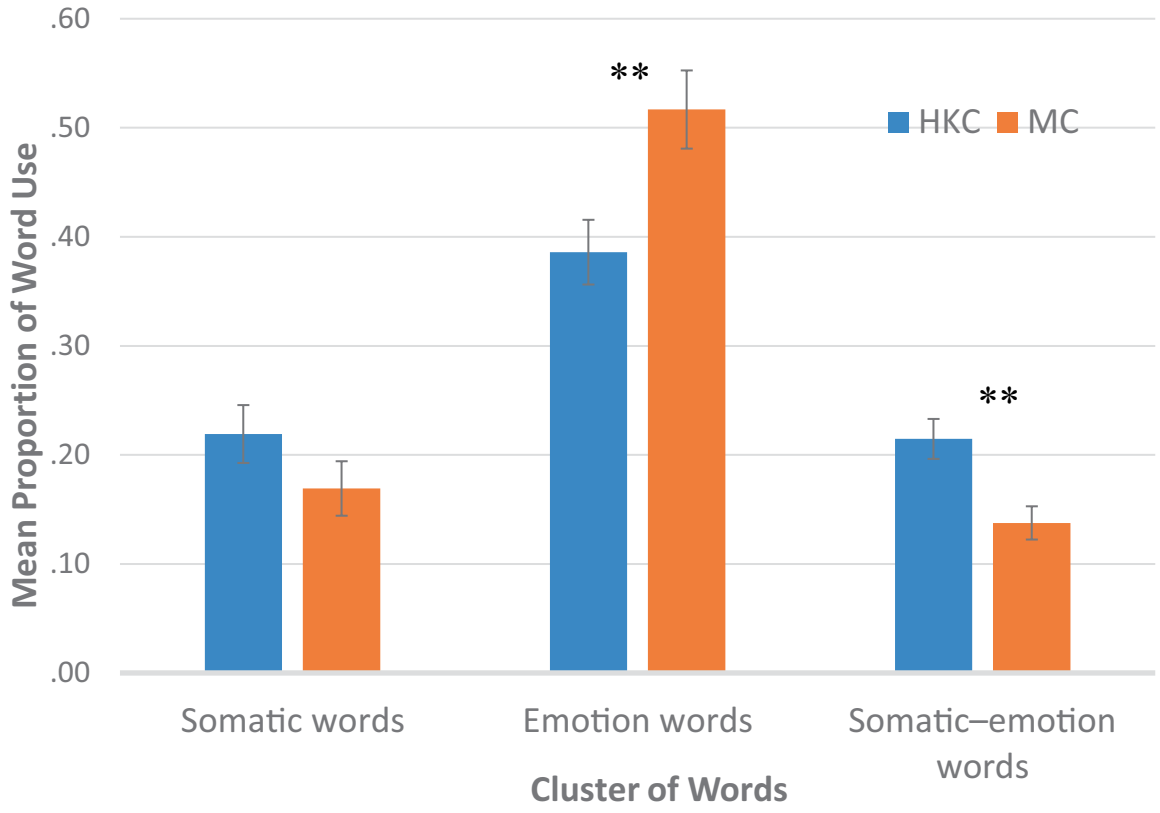

FIGURE 1
Use of somatic, emotion, and somatic–emotion words by group $^{**}p < 0.01$, two-tailed.

somatization and North American or European psychologization (see Kirmayer and Young, 1998). Although our Chinese subjects used both somatic and emotion terms, the more enculturated (to Chinese culture) subjects used more emotion terms than the less enculturated. Indeed, Dere et al. (2013) found that Canadian psychiatric patients of European ethnic origins endorsed high levels of atypical somatic symptoms, such as weight gain and appetite gain. Zhou et al. (2011) found that Chinese psychiatric patients had a higher tendency to emphasize somatic symptoms of depression, whereas Canadian patients of European ethnic origins had a higher tendency to emphasize somatic symptoms of anxiety (see also Ryder et al., 2008). Future work should be directed at finer-grained analyses using individual symptoms in lieu of scales (each composed of symptoms) and diverse types of emotion events. Relatedly, it would be prudent to move beyond the dichotomization of psychologization and somatization in characterizing cultures (see Kirmayer and Young, 1998).

Enculturation to Chinese culture

To test the relationship between culture and somatization, we used two samples of Chinese participants who varied in their orientation to—and the extent to which they identified with—Chinese culture. We dichotomized the variable of cultural orientation using two criterion groups of students in a local university. In future studies, it would be worth actively recruiting non-student participants who vary along the dimension of cultural identity to further test the effect of cultural orientation on symptom presentation style (e.g., Tsai et al., 2004). Longitudinal studies are another alternative, as symptom reporting styles might vary as a function of a person's length of stay in a place and/or acculturation to a certain culture.

To measure enculturation, we relied on the General Ethnicity Questionnaire. The items on this questionnaire do not define what Chinese cultural practices and customs are; rather, they tap the participants' subjective perception of their adherence to Chinese culture, which is assumed to be consistent across the two Chinese groups. There is a possibility that "Chinese culture" was defined differently by the HKC and MC participants, and that these discrepancies could explain the present findings. To further the understanding of somatization in Chinese communities, future studies should be geared toward mapping the attributes of Chinese culture and testing how they contribute to somatization.

Conclusion

Somatization is a multifaceted concept, the classical notion of which is a psychological problem being masked by somatic symptoms (Draguns, 1996). Researchers have also argued that somatization represents a help-seeking strategy to secure health care resources, to

avoid stigma, or to reflect the unexplained somatic distress (see Kirmayer and Young, 1998; Parker et al., 2001). Our study used a free listing method in an anonymous survey to ensure that our participants would not put down any (somatic) symptoms for the purpose of seeking help or avoiding stigma. It appears that under this circumstance, Chinese people talk about emotions more than somatic symptoms. Psychological problems were not masked or overshadowed by somatic symptoms, and the group of more enculturated Chinese participants used more emotion terms than the group who were less enculturated.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by HKUST Human Research Ethics Committee. The participants provided their written informed consent to participate in this study.

Author contributions

MY and CC designed the study together. CC coded the data and drafted part of the results section while MY wrote up the entire manuscript for publication. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Alonso, J., Angermeyer, M. C., Bernert, S., Bruffaerts, R., Brugha, T. S., Bryson, H., et al. (2004). Prevalence of mental disorders in Europe: results from the European study of the epidemiology of mental disorders (ESEMeD) project. *Acta Psychiatr. Scand. Suppl.* 420, 21–27. doi: 10.1111/j.1600-0047.2004.00327.x

Beirens, K., and Fontaine, J. R. J. (2011). Somatic and emotional well-being among Turkish immigrants in Belgium: acculturation or culture? *J. Cross-Cult. Psychol.* 42, 56–74. doi: 10.1177/0022022110361773

Berry, J. W. (2005). "Acculturation" in *Culture and human development: The importance of cross-cultural research for the social sciences*. eds. W. Friedlmeier, P. Chakkarath and B. Schwarz (London: Psychology Press/Erlbaum (UK) Taylor & Francis), 291–302.

Chan, D. (1985). The Chinese version of the general health questionnaire: does language make a difference? *Psychol. Med.* 15, 147–155. doi: 10.1017/S0033291700021012

Clore, G. L., Ortony, A., and Foss, M. A. (1987). The psychological foundations of the affective lexicon. *J. Pers. Soc. Psychol.* 53, 751–766. doi: 10.1037/0022-3514.53.4.751

Dere, J., Sun, J., Zhao, Y., Persson, T. J., Zhu, X., Yao, S., et al. (2013). Beyond "somatization" and "psychologization": symptom-level variation in depressed Han Chinese and euro-Canadian outpatients. *Front. Psychol.* 4:377. doi: 10.3389/fpsyg.2013.00377

Draguns, J. G. (1996). "Abnormal behaviour in Chinese societies: clinical, epidemiological, and comparative studies" in *The handbook of Chinese psychology*. ed. M. H. Bond (Oxford: Oxford University Press), 412–428.

Goldberg, D. P. (1978). *Manual of the general health questionnaire*. Windsor, England: NFER.

Hasin, D. S., Sarvet, A. L., Meyers, J. L., Saha, T. D., Ruan, W. J., Stohl, M., et al. (2018). Epidemiology of adult DSM-5 major depressive disorder and its specifiers in the United States. *JAMA Psychiat.* 75, 336–346. doi: 10.1001/jamapsychiatry.2017.4602

Hesketh, T., and Zhu, W. X. (1997). Health in China. Traditional Chinese medicine: one country, two systems. *Br. Med. J.* 315, 115–117. doi: 10.1136/bmj.315.7100.115

Huang, Y., Wang, Y., Wang, H., Liu, Z., Yu, X., Yan, J., et al. (2019). Prevalence of mental disorders in China: a cross-sectional epidemiological study. *Lancet Psychiatry* 6, 211–224. doi: 10.1016/S2215-0366(18)30511-X

James, W. (1884). What is an emotion? *Mind* os-IX, 188–205. doi: 10.1093/mind/os-IX.34.188

Kim, B. S. K. (2007). "Acculturation and enculturation" in *Handbook of Asian American psychology*. eds. F. T. L. Leong, A. Ebreo, L. Kinoshita, A. G. Inman, L. H. Yang and M. Fu (Thousand Oaks, CA: Sage Publications, Inc), 141–158.

King, B. (1989). *The conceptual structure of emotional experience in Chinese. Unpublished doctoral dissertation*. Columbus, OH: Ohio State University.

Kirmayer, L. J. (1984). Culture, affect and somatization: part I. *Transcult. Psychiatr. Res. Rev.* 21, 159–188. doi: 10.1177/136346158402100301

Kirmayer, L. J., and Young, A. (1998). Culture and somatization: clinical, epidemiological, and ethnographic perspectives. *Psychosom. Med.* 60, 420–430. doi: 10.1097/00006842-199807000-00006

Kleinman, A. (1982). Neurasthenia and depression: a study of somatization and culture in China. *Cult. Med. Psychiat.* 6, 117–190. doi: 10.1007/BF00051427

Kleinman, A. (1986). *Social origins of distress and disease: Depression, neurasthenia, and pain in modern China*. New Haven, CT: Yale University Press.

Klineberg, O. (1938). Emotional expression in Chinese literature. *J. Abnorm. Soc. Psychol.* 33, 517–520. doi: 10.1037/h0057105

Kroeber, A. L., and Kluckhohn, C. (1952). *Culture: A critical review of concepts and definitions*. Papers of the Peabody Museum of Archaeology & Ethnology. Harvard University.

Lee, R. P. L. (1980). Perceptions and uses of Chinese medicine among the Chinese in Hong Kong. *Cult. Med. Psychiatry* 4, 345–375. doi: 10.1007/BF00051811

Lee, S. (1999). Diagnosis postponed: Shenjing shuairuo and the transformation of psychiatry in post-Mao China. *Cult. Med. Psychiatry* 23, 349–399. doi: 10.1023/a:1005586301895

Leung, J. P. (1998). Emotions and mental health in Chinese people. *J. Child Fam. Stud.* 7, 115–128. doi: 10.1023/A:1022989730432

Lipowski, Z. J. (1988). Somatization: the concept and its clinical application. *Am. J. Psychiatr.* 145, 1358–1368. doi: 10.1176/ajp.145.11.1358

Mak, W. W. S., and Zane, N. W. S. (2004). The phenomenon of somatization among community Chinese Americans. *Soc. Psychiatry Psychiatr. Epidemiol.* 39, 967–974. doi: 10.1007/s00127-004-0827-4

Mauss, I. B., and Robinson, M. D. (2009). Measures of emotion: a review. *Cognit. Emot.* 23, 209–237. doi: 10.1080/02699930802204677

Ng, S. H., and Lai, J. C. L. (2011). Bicultural self, multiple social identities, and dual patriotisms among ethnic Chinese in Hong Kong. *J. Cross-Cult. Psychol.* 42, 89–103. doi: 10.1177/0022022110361715

Ots, T. (1990). The angry liver, the anxious heart and the melancholy spleen. *Cult. Med. Psychiatry* 14, 21–58. doi: 10.1007/BF00046703

Park, L., and Hinton, D. (2002). Dizziness and panic in China: associated sensations of Zang fu organ disequilibrium. *Cult. Med. Psychiatry* 26, 225–257. doi: 10.1023/A:1016341425842

Parker, G., Chan, B., Tully, L., and Eisenbruch, M. (2005). Depression in the Chinese: the impact of acculturation. *Psychol. Med.* 35, 1475–1483. doi: 10.1017/S0033291705005623

Parker, G., Cheah, Y. C., and Roy, K. (2001). Do the Chinese somatize depression? A cross-cultural study. *Soc. Psychiatry Psychiatr. Epidemiol.* 36, 287–293. doi: 10.1007/s001270170046

Parker, G., Gladstone, G., and Chee, K. T. (2001). Depression in the planet's largest ethnic group: the Chinese. *Am. J. Psychiatr.* 158, 857–864. doi: 10.1176/appi.ajp.158.6.857

Rosaldo, M. Z. (1984). "Toward an anthropology of self and feeling" in *Culture theory: Essays on mind, self, and emotion*. eds. R. A. Shweder and R. A. LeVine (Cambridge: Cambridge University Press), 137–157.

Russell, J. A., and Yik, M. (1996). "Emotion among the Chinese" in *The handbook of Chinese psychology*. ed. M. H. Bond (Oxford: Oxford University Press), 166–188.

Ryder, A. G., and Chentsova-Dutton, Y. E. (2012). Depression in cultural context: "Chinese somatization," revisited. *Psychiatr. Clin. N. Am.* 35, 15–36. doi: 10.1016/j.psc.2011.11.006

Ryder, A. G., Yang, J., Zhu, X., Yao, S., Yi, J., Heine, S. J., et al. (2008). The cultural shaping of depression: somatic symptoms in China, psychological symptoms in North America? *J. Abnorm. Psychol.* 117, 300–313. doi: 10.1037/0021-843X.117.2.300

Saint Arnault, D. (2009). Cultural determinants of help seeking. *Res. Theory Nurs. Pract.* 23, 259–278. doi: 10.1891/1541-6577.23.4.259

Schachter, S., and Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychol. Rev.* 69, 379–399. doi: 10.1037/h0046234

Simon, G. E., VonKorff, M., Piccinelli, M., Fullerton, C., and Ormel, J. (1999). An international study of the relation between somatic symptoms and depression. *N. Engl. J. Med.* 341, 1329–1335. doi: 10.1056/NEJM199910283411801

Tsai, J. L., Simeonova, D. I., and Watanabe, J. T. (2004). Somatic and social: Chinese Americans talk about emotion. *Personal. Soc. Psychol. Bull.* 30, 1226–1238. doi: 10.1177/0146167204264014

Tsai, J. L., Ying, Y. W., and Lee, P. A. (2000). The meaning of "being Chinese" and "being American": variation among Chinese American young adults. *J. Cross-Cult. Psychol.* 31, 302–332. doi: 10.1177/0022022100031003002

Tung, M. P. M. (1994). Symbolic meanings of the body in Chinese culture and "somatization". *Cult. Med. Psychiatry* 18, 483–492. doi: 10.1007/BF01565850

Veith, I. (1972). *Huang ti Nei ching Su wen [the yellow emperor's classic of internal medicine]*. Berkeley: University of California Press.

Widen, S. C., Christy, A. M., Hewett, K., and Russell, J. A. (2011). Do proposed facial expressions of contempt, shame, embarrassment, and sympathy communicate the predicted emotion? *Cognit. Emot.* 25, 898–906. doi: 10.1080/02699931.2010.508270

Wu, D. (1982). "Psychotherapy and emotion in traditional Chinese medicine" in *Cultural conceptions of mental health and therapy*. eds. A. J. Marsella and G. M. White (Dordrecht: Reidel), 285–301.

Yen, S., Robins, C. J., and Lin, N. (2000). A cross-cultural comparison of depressive symptom manifestation: China and the United States. *J. Consult. Clin. Psychol.* 68, 993–999. doi: 10.1037//0022-006x.68.6.993

Yik, M. (2010). "How unique is Chinese emotion?" in *The Oxford handbook of Chinese psychology*. ed. M. H. Bond (Oxford: Oxford University Press), 205–220.

Zheng, Y., Xu, L., and Shen, Q. (1986). Styles of verbal expression of emotional and physical experiences: study of depressed patients and normal controls in China. *Cult. Med. Psychiatry* 10, 231–243. doi: 10.1007/BF00114698

Zhou, X., Dere, J., Zhu, X., Yao, S., Chentsova-Dutton, Y. E., and Ryder, A. G. (2011). Anxiety symptom presentations in Han Chinese and euro-Canadian outpatients: is distress always somatized in China? *J. Affect. Disord.* 135, 111–114. doi: 10.1016/j.jad.2011.06.049

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The impact of culture perception on kinship disconnection of Chinese youth: examining the chain mediating effect of kinship support, kinship burnout, and social media interaction

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Kinship connections are an essential foundation of social relationships in China, yet in recent years there has been an increasing tendency toward kinship disconnection (Duanqin) among Chinese youth. In this study, based on online survey data of 555 Chinese individuals aged 18–35years under a comprehensive explanatory framework of culturalism, functionalism, and behaviorism, regression and mediation analyses found that (1) cultural perception based on family-state values is the dominant factor influencing people's tendency to disconnect. (2) Kinship support decreases people's propensity to break off relatives, while kinship burnout increases people's propensity to cut off relatives. Both act as functionalist factors in the chain that mediates the effect of cultural perception on the propensity to break kinship, and kinship burnout obscures the effect of kinship support and becomes a differentiating variable. (3) Both social media kin interaction size and kin group activity significantly reduce people's propensity to disconnect. However, group activities are more significant in cultural perception's mediating effect on disconnection propensity. It indicates that truly "active" social media connections are more important. The study attempts to propose a framework of "cultural perception+functional satisfaction and burnout+social media" to interpret Chinese youth kinship communication activity. On a practical level, more support for young people in social media interactions could slow or even reverse the trend of disconnection.

KEYWORDS

breaking off kinship, culture perception, kinship support, kinship burnout, kin interaction size, kin group activity

Introduction

In recent years, more young people in China are becoming estranged from their families. A study of young people showed that 77.22% of 18–25 year olds only "occasionally" or "never" contact their relatives, and 71.11% of 26–30 years olds (Hu and Han, 2022). This phenomenon has also received media attention. For example, after the 2023 Chinese New Year, major Chinese newspapers such as Southern Weekend and The Beijing News, in addition to online media source, The Paper (Pengpai), and social media outlets Douban, Bilibili, Tiktok or Kuaishou, all published articles and reports covering the topic of Chinese youth becoming estranged from

their family (Liu, 2023; Yg, 2023). One video article on Bilibili, "The Wave of Kinship Disconnection Is Sweeping China's Younger Generation," reached nearly 1.06 million views (Hardcore, 2023). Many phenomena show "kinship disconnection" (Duanqin) forming among Chinese youth. "Kinship disconnection" refers to the phenomena of when young people, who are tired of kinship ties, adopt an attitude of rejecting or refusing to partake in interpersonal communication with their family, or even directly "cutting off ties" with their family members (Hu and Han, 2022). There are three stages which comprise the phenomena of Kinship disconnection: alienation, dilution, and distancing (Hu and Han, 2022). Previous literature has sought to explain the growing rates of young individuals' estrangement with their families by investigating the impact of urbanization upon young Chinese individuals (Yan, 2021; Hu and Han, 2022). However, the trend of urbanization has been in effect since 1992 in China (Gao et al., 2015), and the recent rise in kinship disconnection has taken place within the last few years.

An examination of the phenomenon of kinship breaking need to review and analyze Chinese family traditions and organizational structures. In fact, family relations have always been an important foundation for the functioning of Chinese society (Giskin and Walsh, 2001; Chu, 2010). "Family" is also considered by many Western scholars to be an important lens for understanding Chinese culture (Ebrey, 1991). As early as 1948, Chinese sociologist Fei Xiaotong proposed the theory of "differential modes of association"(Chaxugeju), which refers to the construction of Chinese social relations as a ripple of individual-centered, parents, siblings, relatives and geo-relative relations expanding outward (Fei et al., 1992). This is closely aligned with traditional Chinese agrarian culture. By the 1980s in China, this support of kinship ties of family group played an important role in the transformation of modern enterprises in South China, and it even became support for the modernity of the late 20th century (Weidenbaum, 1996; Redding, 2000). It means the family is an important resource for the social life of individuals, both in terms of the traditional agrarian way of life and in terms of the modern post-factory mode of organizing social life (Yan, 2021). Therefore, it is not difficult to understand why some Chinese scholars still consider "home" as the main cultural and organizational resource for seeking social integration and functioning (Xiao, 2017).

For the past few years, Chinese youth really seem to be tired of "family" and have a tendency to "cut off relatives," especially during the Chinese New Year, a traditional Chinese family reunion ritual. As China's socio-economic transition continues, the Chinese New Year has taken on a new economic and ritual significance (Xiao et al., 2017). The lack of return home or the active avoidance and denial of contact with relatives during the Chinese New Year is a further indication of the seriousness of this problem. Different scholars have given different explanations, for example, Xiang (2021) thinks modern families cannot be too aggressive and affect personal development, which actually involves the impact of family and personal boundaries also known as family negativity. Hu and Han (2022) believes that social comparison and pressure brought by extended family connection as well as changes in social structure are the reasons for the formation of the trend of family disconnection, and Sun (2023) summarizes that there are three major perspectives to interpret this phenomenon: moral and cultural perspective, class mobility perspective and social relationship perspective. That is, people focus on the structural level to find the causes, but what causes or perspectives can lead to a more comprehensive analysis from the individual level of analysis?

This paper intends to analyze kinship disconnection by Chinese youth in three theoretical approaches: culturalism, functionalism, and behaviorism. Culturalism focuses on the role of culture in people's daily practices and lifestyles from the path of British cultural studies, which emphasizes the influence of soft factors such as meaning and values more than structuralism factors (Dirlik, 1987). In our study, the main focus is on whether family values specific to China influence people's choice of kinship or kin-breaking behavior (Xu and Xia, 2014). Functionalism is mainly from the perspective of structural functionalism since Parsons, that is, certain cultural settings and relational structures exist because they fulfill certain functions (Swenson, 2004). For the phenomenon of kinship disconnection among Chinese youth, is it because kinship connections not only do not give enough support but also bring burnout that eventually contribute to this "rational" choice of theirs? For the behaviorism perspective, which focuses on the objective process of behavior (Muchon de Melo and de Rose, 2013), with the internetization of social behavior, we are concerned whether the scale of kinship connections and the status of interactions in social media can predict their "disconnection" behavior. These three theoretical perspectives basically encompass the possible factors from "agency" to "structure" and inspire us to propose a combination of variables to explain the phenomenon. From a comparative perspective, unlike Xiang, Hu, and Sun's explanations above, this theoretical framework is more suitable for explaining kinship choices made from the standpoint of young actors in contemporary social contexts. Corresponding to the existing studies, our research questions thus focus on whether the tendency of Chinese young people to disconnect is influenced by the cultural conception of family-state views that may be closely related to the issue, and whether family support or burnout of the individual affects the tendency to disconnect. Finally, from the perspective of behavioral prediction, are the scale and frequency of kin interactions on social media a valid perspective to observe the tendency of young people to disconnect? What are the patterns of relationships between functional, behavioral, and cultural variables? By answering the above questions, we hope to have a comprehensive explanation of the current phenomenon of kin disconnection among Chinese young people and to dialog with the existing research explanations.

Literature review and research hypothesis

Cultural perception: the possible influence of family-state view on Chinese youth's tendency to break off kinship

Cultural value plays a critical role in people's relationships with kin (Hsu, 2017). Diverse cultural forms are closely related to the value of kinship, and according to Schneider, "on a purely cultural level, there is no such thing as kinship" (Sahlins, 2011). Within this pattern of relationships, different cultures and countries have developed different family sizes and kinship relationships (Schwartz, 2006). For China, the distinction between "ethical-based structure" and "individual-based structure" in Liang Shuming's analysis (1949) of the cultural differences between East and West has been an essential concept in the exploration

of the cultural characteristics of the Chinese family (Weiming and Xiaoyu, 2009). In a modern sense, different cultural types affect family size, how family members are connected, and the raising of offspring. For example, Popenoe analyzed the changing structure and patterns of the Western family (Popenoe, 2020), while Selin analyses different approaches to parenting in non-Western cultures (Selin, 2013), Ponczek et al. directly analyses the causal effect of family size on child quality in a developing country (Ponczek and Souza, 2012). Regarding externalities, family structures may influence economic growth and development patterns (Greif, 2006). Not only do different cultures correspond symbiotically to different family structures and values, but in turn different types of family structures also influence the logic of intergenerational parenting and the economic performance of the societies in which they operate.

"The differential mode of association" is a fundamental concept for understanding interpersonal relationships in Chinese society. This concept, proposed by Fei Xiaotong in 1948, points out that the social relations of Chinese people based on the vernacular foundation of agricultural society are characterized by a gradual outward extension from parents, relatives, and kin (Barbalet, 2021). Although it is said to be village-centric, the "relationship" (Guanxi) concept subsequently developed by Bian Yanjie and others on top of this has become a key to understanding modern Chinese society (Bian, 2018). Furthermore, changing cultural attitudes also influence changes in family structure and size (Coombs and Sun, 1978; Popenoe, 2020). This is especially true when the composition of family size affects the distribution of resources within the family (Blake, 2022). However, the sequential unity of the family state in Eastern cultures, especially Confucianism, and its dominant role in the functioning of modern social organization encourage young people to maintain ties with their original kin and reduce disconnection or tendency to disconnect, so we hypothesize that.

> *Hypothesis 1*: cultural perception of the "family state" is negatively associated with young people's tendency to disconnect.

Functionalism perspective: the role of kinship support and kinship burnout in the development of Chinese youth's tendency to break off kinship

In fact, with the transformation of Chinese society and its development on modernization, scholars have increasingly found that the simple cultural concept of "the differential mode of association" is no longer sufficient to explain the interpersonal networks of the Chinese public after the 1990s, which led Li Peiliang to propose the concept of "instrumentalist differential order pattern" (Peiliang, 1993) which points out that the differential pattern based on blood is insufficient to explain the relationship connection of people in modern society based on work units and organizations, and that the social organization model close to the Western "individual" connection will replace the original "ethics" based kinship connection model. Wellman (2002) demonstrates that in the functioning of modern urban-centered societies, non-territorial and loosely based connections supported by specialization characterize the relational connections of urban populations. So what kind of people will be central in forming new relational networks? Granovetter's research on social relations provides extensive support towards answering this question (Granovetter, 1973). Granovetter's findings suggest that those who are able to provide relatively strong social capital support will become significant figures in an individual's social network, while those who cannot will be on the periphery. Overlaying Chinese sociocultural attributes, the researchers Bian and Ang found that episodic "ties" based on kinship and geography remain variables that support people in important life events such as when searching for employment (Bian and Ang, 1997). Granovetter's and Bian's studies point to the emotional and material support that traditional kinship ties can provide in terms of relationships, networks, and information support, that is, a gradual convergence with the concept of social capital. Prandini's research points out that the family is an important source and building block of social capital (Prandini, 2014). We hypothesize that a young person may be less inclined to disconnect if he or she receives more material, emotional, informational and network support from kinship.

> *Hypothesis 2*: Kinship support is negatively associated with young people's tendency to disconnect.

However, it is important to acknowledge that while families can support individuals, they can also be a hindrance or even be harmful, sometimes in the form of material, emotional, and psychological burdens. Ennis and Bunting's research has found that family burdens can have an impact on people's quality of life, often in the form of mental health responses (Ennis and Bunting, 2013), while significant stigmatizing events within the family can have an even more devastating impact on a person's mental health (Lefley, 1989). Some different approaches and classifications have been proposed for the measurement of burden. A distinction between objective and subjective burdens prevails (Schene, 1990), which has evolved to be described directly by the term "perceived family burden". In perceived family burden, "use abusive language," "blame others," "hardly talk," and "act suspicious" were all measured (Levene et al., 1996), meaning that any speech or behavior from within the family can be a source of burden. When this family damage spreads to the kin level, it may significantly impact the individual and even produce family burnout (Ensle, 2005). In the case of Chinese families, extended families or familial families based on "kinship networks" can extend the range of sources of victimization. Especially after the modern transition, when young people generally develop an individualistic self-concept, people are likely to become more intolerant of various types of "harm" from different relational distances and to resort to kinship disconnection. We therefore hypothesize that.

> *Hypothesis 3*: kinship burnout is positively associated young people's tendency to disconnection.

Behaviorism perspective: the effect of kin network interaction in social media on Chinese youth's tendency to break off kinship

Many studies have argued that the increased geographical distance of young people who have left home for school or work after modern society's transformation will dilute people's kinship connections. In

reality, however, the widespread use of social media today makes it easier for people to connect daily. At the same time, even people in close proximity may interact online, i.e., people's daily interactions and communication behaviors are generally being mediated by the Internet (Yus, 2011). In this context, we can look for more objective indicators when considering the impact of online kinship interactions on the tendency to disconnection. As early as 1976, Mayhew and Levinger analyzed the effects of the size and density of population interactions on patterns of urban population association (Mayhew and Levinger, 1976). In contemporary analyses of people's social networks, interaction size and frequency have been variables considered, and they affect the structure of individual social networks (Hill and Dunbar, 2003). Many studies on online interactions have also shown that interaction size and frequency do have an impact on family relationships (Subrahmanyam and Greenfield, 2008). It has also been found in everyday life that people who usually have larger and more frequent contact with family members and relatives are also less likely to exhibit sudden disconnection behaviors. We therefore hypothesized:

> *Hypothesis 4*: the scale of kinship interaction is positively associated with young people's tendency to disconnect.

The emergence of social media provides a new platform for people to connect one-to-one daily. It also allows group connections to be reproduced or developed in the form of various "groups," people can reconstruct groups in their daily lives on social media. For young Chinese people, various groupings are essential to their social media platforms. Traditional family groups based on blood and marriage also appear in different forms in their social media contact lists. The "differential pattern" can be realized in the group matrix of social media platforms and various combinations oriented by relational closeness and relational needs. Just as the scale and frequency of interactions with relatives in daily life can predict whether young people will engage in disconnection behaviors, the daily activities in various family groups should, to some extent, explain or predict the tendency of young people to connect with relatives in terms of relational closeness, so we hypothesize that:

> *Hypothesis 5*: the activity of family group interactions is positively associated young people's tendency to disconnection.

The interaction of three perspectives: kin support and burnout, and the role of social network interaction in the influence of cultural perception on young people's tendency to break off kinship

The above literature demonstrates that young people with stronger cultural perceptions of a family may be less likely to engage in family disconnection behaviors, while kinship support and burnout negatively and positively affect young people's tendency to disconnect, so what kind of relationship exists between the three? In fact, for traditional Chinese family relationships, cultural perception has always been the dominant influence, and Fei Xiaotong, in his "From the Soil: The Foundations of Chinese Society," treats the benefits of this model of family union as a set of "chopsticks" that can play more than a chopstick's role (Gu et al., 2017). In such cases, it sometimes even happens that family needs are met at the expense of personal interests. This is also considered proof that traditional Chinese society is based on "collectivism" rather than "individualism," and since the 1970s, Granovetter's research on strong and weak relationships has entered the field of Chinese social phenomena, combining with the original research concepts to form a unique field of "relationship" research. The field of "relationship"(*Guanxi*) research is unique. This field began to focus on introducing some of the measurement dimensions of strong and weak ties research, namely the variables related to social capital: material, emotional, information. Li Peiliang then developed the concept of "instrumental" differential patterns. Since there is support, there must be damage, and the damage will be around "emotion," "material," "relationship," etc. Thus, it is reasonable to infer that although cultural perception may still dominate people's propensity for kinship connections, kinship support positively strengthens such relationships, and kinship burnout negatively reduces them, so we hypothesize that:

> *Hypothesis 6*: kinship support will strengthen the negative effect of cultural perception on young people's tendency to disconnect.

> *Hypothesis 7*: kinship burnout will weaken the negative effect of cultural perception on young people's tendency to disconnect.

Indeed, any relationship's maintenance relies on maintaining people's dynamics, and ongoing interactions reinforce the recognition and maintenance of shared values (Bayer et al., 2016), and poor interactions can be disruptive (Aldridge, 1984). In general, the scale of daily interactions reduces the likelihood that people will suddenly break these ties in the first place because it means that individuals have been cultivating resources in this social network. A sudden break may result in the loss of previous social capital accumulation (Ellison et al., 2014). Therefore, it is reasonable to hypothesize that populations with a large scale of daily kin interactions enhance the influence of cultural perceptions on the tendency to maintain kin-connected relationships and reduce the propensity or likelihood of people disconnecting. It should be noted that in today's world, where social media fully mediates people's interpersonal relationships in daily interactions, this interpersonal scale is more appropriately measured by the social media interaction kinship scale. At the same time, the activity status of kinship groups based on different affinities in social media is a better predictor of individuals' tendency to break kinship. Intra-group activities are essential for members to maintain relationships (Bryant and Marmo, 2009). Tong and Walther also showed that many family groups enhance connections precisely through group activities (Tong and Walther, 2011). Moreover, frequent in-group activities may further enhance the influence of cultural perception on people's kinship maintenance, acting as a positive moderator or mediator. We, therefore, hypothesized that:

> *Hypothesis 8*: the size of kinship interactions will strengthen the negative effect of cultural perception on young people's tendency to disconnect.

TABLE 1 Distribution of the sample's socio-demographic information ($N = 555$).

	Categories	Frequency	Percentage (%)
Gender	Male	258	46.5
	Female	297	53.5
Education	High school and below	11	2.0
	College/University	487	87.7
	Master	52	9.4
	Doctor and above	5	0.9
Income (CNY/ Month)	0	29	5.2
	<4,999	70	12.6
	5,000–9,999	230	41.4
	10,000–14,999	150	27.0
	15,000–19,999	47	8.5
	20,000–24,999	18	3.2
	=>25,000	11	2.0
Married	Single	205	36.9
	Married	347	62.5
	Divorce	3	0.5
Birthplace	City	329	59.28
	Town	53	9.55
	Rural	173	37.17
Work/study place same with birthplace	Yes	292	52.61
	No, different cities or counties in the same province	177	31.89
	No, other provinces	86	15.5
Age	Mean	28.6	

> *Hypothesis 9*: the activity of family group interactions will strengthen the negative effect of cultural perception on young people's tendency to disconnect.

Based on the above research hypotheses, we further consider how functionalism variables such as family support and burnout connectively contribute to young people's propensity to break off kinship. Similarly how do behaviorism variables such as interaction size and interaction frequency connectively contribute to young people's propensity to break off kinship? We therefore continue to formulate the following hypothesis:

> *Hypothesis 10*: Kinship support and burnout have chain mediating effect of cultural perception on young people's tendency to disconnect.

> *Hypothesis 11*: The scale of kinship interaction and group activity have chain mediating effect of cultural perception on young people's tendency to disconnect.

Method

Sample and data

This study used an online survey to collect data related to kinship contact status of 555 young people aged 18–35 years from 30 provinces and cities in mainland China (data were not collected from Qinghai and Xinjiang) from February 6 to February 14, 2023. We used the sample service of Questionnaire Star,[1] and at the same time, we made some controls. For example, access paths, number of answers, and logical questions are set so that a phone number can only be registered once and cannot be answered repeatedly, as well as limiting the number of times a user can break off and resume answering. The final demographic data we recovered for the sample is as follows: 87.7% had a bachelor's degree, and 68.4% received 5,000–14,999 CNY per month. Married people accounted for 62.5%, and the average age was 28.6. In conjunction with the study topic, the place of birth and the relationship with the current place of work of the survey respondents were also examined, as detailed in Table 1.

Measures

Tendency to break off kinship

For kinship relationships, festivals are the most testing time for people's connection density (Humphrey, 1979). Furthermore, for Chinese people, Spring Festival is the biggest festival where people talk about "reunion" and even relatives who are not usually in contact with each other usually have a chance to meet (Xiao et al., 2017). Therefore, we used the question of who we spent the Spring Festival with to measure our tendency to break off kinship. The specific question is: How did you spend this Spring Festival? The multiple-choice items are 1. Attended multiple gatherings or visited multiple relatives; 2. Only visited or participated in gatherings with 1–2 relatives; 3. Only visited or spent time with parents (or spouse's parents); 4. Spent time by myself or small family and did not visit or participate in gatherings with other relatives; 5. Spent time with friends and did not visit or participate in gatherings with other relatives or others. The tendency to break off the kinship variable has a maximum value of 5 and a minimum value of 1 ($M = 1.77$, $SD = 1.004$). It is important to note that for tendency to break off kinship perhaps a more multidimensional measure would be more meaningful, as some researchers have done for similar cultural concepts (Shi and Wang, 2019), and we will follow up by deepening our measurement of this concept.

Cultural perception (view of family-state)

As Weiming and Xiaoyu (2009) believed 100 years ago, Chinese people have an "ethical-based structure" of cultural values instead of Westerners' "individual-based structure." (Weiming and Xiaoyu, 2009). The emphasis on "state" and "family" has become an essential indicator of the extent of traditional Chinese values. Combining the

1 https://www.wjx.cn/

sections on "state" and "family" in Kim et al.'s measure of Asian cultural values (Kim et al., 1999) and the question items in Shi (1999) measure of Chinese cultural values, we ended up with the following measurement questions: Please give your opinion on the following views: 1. children should be filial to their parents; 2. kinship in the extended family is the basis of one's social relationship; 3. there is a family before there is a country, and a well maintained extended family is the guarantee of national stability. The options are 1. strongly agree; 2. relatively agree; 3. generally agree; 4. relatively disagree; 5. strongly disagree. The answers are assigned in reverse order, added together, and divided by 3 to obtain the indicator "View of family-state" (Cronbach's $\alpha = 0.721$, M = 4.06, SD = 0.76).

Kinship support

We draw primarily on Granovetter's discussion of social capital and social support to measure kinship support (Fulkerson and Thompson, 2008). With the characteristics of people's interpersonal connections in the Internet era (Carr et al., 2016), the support that young people can access in their family networks was classified into four categories: material, emotional, informational, and relational. The measurement question was as follows: please rate your overall interaction with the following categories of people. The vertical categories include parents, immediate siblings and grandparents, and relatives. The horizontal scale includes 1. receiving material or monetary help; 2. receiving advice, opinions, and emotional support; 3. receiving information or network support that is useful for your study or work. The matrix options are always, often, occasionally, and none, and after assigning 4, 3, 2, and 1, respectively, they are summed and divided by 9 to obtain the kinship support indicator (Cronbach's $\alpha = 0.768$, M = 2.69, SD = 0.51; Min = 1.22, Max = 4).

Kinship burnout

Regarding the measurement of kinship burnout, we mainly referred to the measurement of burnout and family burden (Levene et al., 1996), combined with the problems that often occur in Chinese people's life, such as the sense of boundary, and finally, locked in the following four items: 1. often compare you with others; 2. often ask questions that you do not like to answer; 3. have done something terrible to you; 4. bring trouble to you and add affairs. The vertical categories still include parents, immediate siblings, grandparents, and relatives. The matrix options include always, often, occasionally, and not. After assigning the values 4, 3, 2, and 1, the summation is divided by 12 to obtain the family burnout indicator (Cronbach's $\alpha = 0.859$, M = 3.17, SD = 0.53; Min = 1.08, Max = 4).

Scale of closely interacted relatives

For the measurement of the size of closely interacted relatives, we used the following question: the number of people you interact with most closely in your WeChat list (including private chat, group chat, likes, comments, and retweets) is three types of people in the vertical matrix: parents, immediate siblings and grandparents, and relatives. The horizontal selection matrix options include 1.0 people; 2.1–2 people; 3.3–7 people; 4.8–15 people; 5.16 and above. The size of the closely interacted relatives indicator was obtained by adding the scores of each option and dividing by 3 (M = 2.51, SD = 0.65).

Activity in family groups

Our measurement question for activity in family groups was: What is your membership in various family groups? The vertical column includes: 1. groups with parents; 2. groups where the primary members are parents, immediate siblings, and grandparents; 3. groups where the main members are (cousins, cousins) siblings; 4. extended family groups of relatives. The horizontal coordinates include: 1. have and often speak and interact; 2. have but rarely speak; 3. have but hardly speak; 4. have not; 5. once had and have disbanded or withdrawn from the group. The options were assigned 0–4 in reverse order, and the results were summed and divided by 4 to obtain the family group activity index (Cronbach's $\alpha = 0.768$, M = 2.68, SD = 0.77; Min = 0.22, Max = 4).

Statistical analysis

We examine the mediated effects of different combinations of variables by using model 82 in the PROCESS macro (Hayes, 2018) to answer h1–h5. The regression results are summarized in Table 2. Further, the chain-mediated results are summarized in Table 3 and Figure 1 to answer h6–h9 and RQ1 and RQ2.

Results

Significant variables influencing young people's tendency to break off kinship

The final model in Table 2 shows that demographic variables such as gender, age, education, income, and marital status do not significantly affect young people's propensity to disconnect compared to the core variables we focus on. In contrast, cultural perception, kinship support, burnout, social media kin interaction size, and kinship group activity all significantly influence the formation of young people's propensity to disconnection. For example, in the overall regression model, the cultural perception had the highest influence coefficient of $\beta = -0.280$ ($p < 0.01$), which means that the stronger the family-state values are, the less likely young people are to develop the tendency of family disconnection, supporting H1; kinship support acquisition showed a negative correlation with young people's tendency of kinship disconnection, with an influence coefficient of $\beta = -0.219$ ($p < 0.01$), which means that the more kinship support they receive, the less likely they are to develop the tendency of kinship disconnection, supporting H2; while conversely young people with greater kinship burnout are more likely to break off kinship ($\beta = 0.221$, $p < 0.01$), supporting H3. Regarding social media kinship connections, the size of closely interacted relatives showed a significant negative correlation with a tendency to break off kinship ($\beta = -0.134$, $p < 0.05$). Youth family group activity also showed a significant negative correlation with a tendency to break off kinship ($\beta = -0.242$, $p < 0.01$), demonstrating that youth with large size of daily social media kin connections are less likely to tend to break off kinship. Youth with high activity in social media kin groups are also less likely to have less tendency to break off kinship tendencies, demonstrating that H4 and H5.

TABLE 2 Results of regression analysis of tendency to break off family ($N = 512$).

	Kinship support	Kinship burnout	Size of closely interacted relatives	Activity in family groups	Tendency to break off kinship	Tendency to break off kinship
Constant	1.835** (8.394)	2.271** (10.028)	1.074** (3.622)	1.482** (4.505)	3.873** (9.973)	4.404** (9.891)
Male	0.109* (2.348)	−0.041 (−0.906)	0.053 (0.970)	−0.062 (−1.034)	−0.031 (−0.378)	0.013 (0.163)
Age	−0.010 (−1.326)	0.025** (3.529)	0.005 (0.623)	0.025** (2.645)	0.009 (0.714)	0.006 (0.455)
Education	0.025 (0.402)	−0.137* (−2.310)	0.006 (0.087)	−0.111 (−1.424)	−0.089 (−0.815)	−0.066 (−0.639)
Income	0.041 (1.828)	0.003 (0.137)	0.009 (0.348)	0.037 (1.265)	−0.055 (−1.364)	−0.031 (−0.808)
Married	0.126* (2.154)	−0.135* (−2.363)	0.167* (2.435)	0.049 (0.651)	−0.130 (−1.252)	−0.005 (−0.052)
Value of family-state	0.056 (1.822)	−0.198** (−6.675)	0.039 (1.043)	0.256** (6.298)	−0.425** (−7.842)	−0.280** (−4.996)
Kinship support		0.256** (5.918)	0.463** (8.665)	0.459** (7.326)		−0.219* (−2.504)
Kinship burnout			−0.014 (−0.266)	−0.270** (−4.635)		0.221** (2.791)
Scale of closely interacted relatives				0.214** (4.383)		−0.134* (−2.030)
Activity in family groups						−0.242** (−4.084)
R^2	0.045	0.150	0.185	0.332	0.129	0.222
Adjusted R^2	0.034	0.138	0.172	0.320	0.119	0.206
F	$F(6,505) = 3.962$, $p = 0.001$	$F(7,504) = 12.692$, $p = 0.000$	$F(8,503) = 14.277$, $p = 0.000$	$F(9,502) = 27.767$, $p = 0.000$	$F(6,505) = 12.480$, $p = 0.000$	$F(10,501) = 14.277$, $p = 0.000$

*$p < 0.05$ and **$p < 0.01$, T-value in parentheses.

TABLE 3 Summary of process model 82 mediation test results.

Items	Indirect effect	BootSE	BootLLCI	BootULCI	Direct effect	Test results
Total indirect effect	−0.1615**	0.0358	−0.2360	−0.0986		
VFS = >kinship support = >TBOF	−0.0158**	0.0110	−0.0420	−0.0001	−0.2809**	Partial mediation effect
VFS = >kinship burnout = >TBOF	−0.0448**	0.0171	−0.0807	−0.0144	−0.2809**	Partial mediation effect
VFS = >SCIR = >TBOF	−0.0128	0.0085	−0.0327	0.0007	−0.2809**	No significant mediation effect
VFS = >AFG = >TBOF	−0.0835**	0.0246	−0.1350	−0.0398	−0.2809**	Partial mediation effect
VFS = >kinship support = >kinship burnout = >TBOF	0.0038**	0.0026	0.0001	0.0102	−0.2809**	Masking effect
VFS = >SCIR = >AFG = >TBOF	−0.0083**	0.0051	−0.0198	−0.0002	−0.2809**	Partial mediation effect

**$p < 0.01$. TBOF, tendency to break off kinship; VFS, view of family-state; SCIR, scale of closely interacted relatives; AFG, activity in family groups.

The mediating role of kinship support and burnout, social media interactions in the relationship between cultural perception and tendency to breaking off kinship

The results of the chain mediation effect test using the process model 82 showed that $R = 0.4686$, R-sq = −0.2196, $F = 28.4763$, df1 = 5.00, df2 = 506 0.00, MSE = 0.7441, and $p = 0.0000$, indicating that the basic model fits well and that the model and the results can be adopted. Further interpretation of the results shows that the direct effect of a view of family-state on a tendency to break off kinship is −0.2809 (se = 0.550295, $t = -5.0573$, $p = 0.0000$), and the effect result does not contain 0 (LLCI = −0.3900, ULCI = −0.1718). Meanwhile, the overall indirect effect was also significant, with an effect size of −0.1615. Analysis of the chains of influence revealed that: (1) Kinship support strengthened the negative effect of cultural values on young people's tendency to break off family, with a partially mediated effect occurring, with an effect size of −0.0158 (LLCI = −0.0420, ULCI = −0.0001), as evidenced by H6. (2) Kinship burnout partially mediated the negative effect of cultural perception on the tendency to

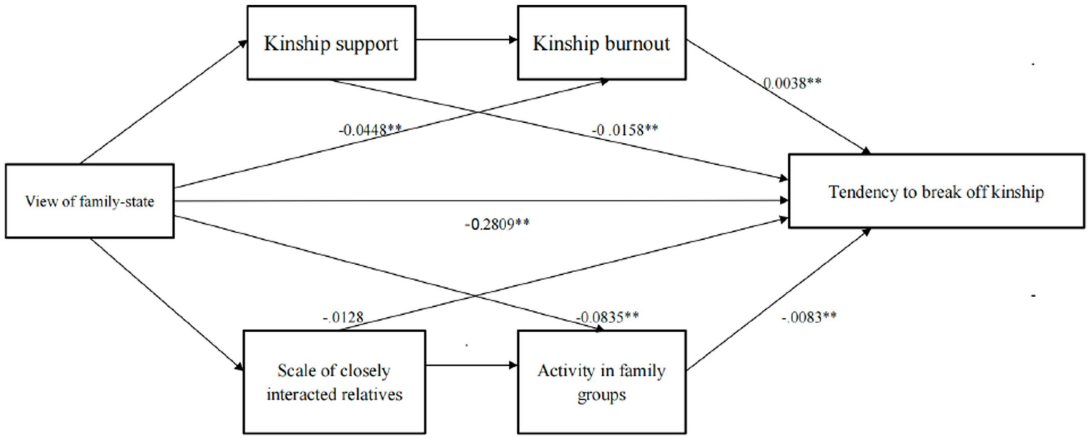

FIGURE 1
"Culture perception + 'support-burnout' + interaction" effect relationship on tendency to break off kinship. **p<0.01.

disconnection, with an effect value of −0.0448 (LLCI = −0.0807, ULCI = −0.0144). H7 was demonstrated (3) Social media kinship interaction size did not significantly mediate cultural perception's effect on the tendency to disconnection (LLCI = −0.0327, ULCI = 0.007). H8 was not demonstrated. (4) Kin group activation played a significant mediating effect in the effect of cultural perception on the tendency to break kin (LLCI = −0.1350, ULCI = −0.0398) with an effect value of −0.0385, as evidenced by H9. Further examination of the chain mediating effect of kinship support and burnout reveals that the positive effect of kinship burnout on the tendency to break off kinship obscures the negative effect of kinship support, with the chain ultimately producing a positive effect value of 0.0038 (LLCI = 0.0001, ULCI = 0.0102). In contrast, the chain of social network interaction behaviors had a negative mediating effect value of −0.0083 (LLCI = −0.0198, ULCI = −0.0002), indicating that the overall chain exerts a negative effect on the tendency to break off kinship. The results verified H10 and H11. See Table 3 and Figure 1 for details.

Summary of test results

Summarizing the results of the above studies, we can clearly see that the cultural variables, functional and behavioral variables specifically play a role in young people's tendency to break off kinship. See Table 4.

Discussion and conclusion

Based on data related to kinship interactions collected from 555 young people aged 18–35 in China, this study found through regression and chain mediation analyses that cultural perception remained the main predictor variable of whether young people adopted kinship breaking behaviors and the propensity to engage in kinship breaking, as evidenced by its comparison with the effect sizes of other variables. However, superimposing the material and psychological support and burnout from kinship relationships shows that material, emotional, and relational support from relatives can significantly reduce people's propensity to break away, while psychological boundary violations and related life burnout increase people's propensity to break away, and overall, this rationalism-based instrumental acquisition and burnout mediates the effect of cultural perception on whether people adopt breakaway behaviors. At the same time, the size and activity of people's daily relative interactions based on social media significantly predicted young people's propensity to cut off relatives. Especially, activity frequency in family groups significantly mediated the influence of cultural perception. In other words, although young people with strong family-state cultural perception are less likely to disconnect, this cultural influence also requires daily social media connections and activities to sustain and support. Of particular note in this is that it is the frequency of kinship interactions, rather than size, that plays this role. The findings of the study deserve further discussion in three main dimensions.

Culturalism, functionalism, and behaviorism variables play a concurrent role in explaining the kinship contact status of Chinese youth, with cultural perception remaining a relatively dominant influence, while functionalism and behaviorism variables are becoming more influential

In traditional Chinese society, the attributes of agrarian society dictate that cultural perceptions based on "the differential mode of association" are the main factors influencing people's kinship connections, as the tightness of kinship ties also directly affects how people unfold and whether they can achieve in other dimensions of social life, which is one of the reasons for the greater explanatory power of culture in the rapid development across Asia after the 1980s (Redding, 2000). However, with the expansion of China's social transformation, i.e., from an agricultural society to an industrial society to today's information society, the separation or even segregation of people's workspace and birth space, and the measurement of the pros and cons of kinship from a functionalist and instrumentalist perspective has increasingly become an active or passive choice in people's real social lives. Although the "instrumentalist differential order pattern" based on Li Peiliang still

TABLE 4 A summary of test results.

	Aim	Hypothesis		Results
1	Examining the relationship between cultural, functional, and behavioral variables and the tendency to break off relatives	H1	VFS → TBOF	√
		H2	Kinship support → TBOF	√
		H3	Kinship burnout → TBOF	√
		H4	SCIR → TBOF	√
		H5	AFG → TBOF	√
2	Examining the mediating effect of functional, behavioral variables between cultural Variables and the tendency to break off relatives	H6	VFS → kinship support → TBOF	√
		H7	VFS → kinship burnout → TBOF	×
		H8	VFS → SCIR → TBOF	√
		H9	VFS → AFG → TBOF	√
3	Examining the chain mediating effect of functional, behavioral variables between cultural variables and the tendency to break off relatives	H10	VFS → kinship support → kinship burnout → TBOF	√
		H11	VFS → SCIR → AFG → TBOF	√

TBOF, tendency to break off kinship; VFS, view of family-state; SCIR, scale of closely interacted relatives; AFG, activity in family groups.

plays a role, if this role is less than the "harm" or "loss" people feel in kinship connection, the tendency of kinship disconnection will occur. Meanwhile, the development of social media has facilitated people's kinship connections across time and space nowadays; thus, the scale and activity of people's kinship connections in social media become factors that can significantly predict people's tendency to connect, and these behavioral performances also significantly moderate the influence of cultural perceptions. In summary, the influence of cultural perceptions needs to exist and be maintained in behavioral interactions. The synthesis of the three theoretical perspective variables described above goes beyond Xiang's perspective (2021) of explaining the tendency to break off relatives and weakening the impact of this phenomenon purely in terms of modern social transformation, while also integrating Hu's meso-interpretation (2022) of the phenomenon of breaking off relatives as viewed from the perspective of intra-familial social comparisons and pressures, and at the same time Sun's proposal (2023) advocating an explanation of this phenomenon in terms of moral culture, class mobility, and social relations. It is a continuation and synthesis of existing Chinese intellectual discussions on this issue, and it also hopes to provide a comparative case for the explanation of such phenomena in different socio-cultural contexts around the world.

The key chain that plays a divisive role in kinship connections among Chinese youth is the push–pull effect of kinship support and burnout

Although cultural perception is the dominant variable supporting whether Chinese youth generate a propensity to disconnect or engage in disconnection behavior, our findings above also indicate whether kinship burnout outweighs the mediating effect of kinship support as a key differentiating variable in influencing young people's decision to disconnect or not. This suggests at least two dimensions: (1) Among the factors affecting the kinship connection status of Chinese youth today, what may be most important is not how much support kinship can provide but whether the burnout caused by kinship exceeds the zero thresholds they can afford. When violations of personal boundaries, daily social comparisons, injuries, and damages reach a certain zero threshold, the impact of kinship support on the maintenance of kinship ties is overshadowed, and a kind of "nonviolent rejection" of kinship ties, which is more prevalent among youth, occurs. In other words, kinship burnout is more critical and sensitive than kinship support when speculating or predicting whether a youth will engage in kinship disconnection behavior. (2) This situation further suggests that although the inertia of cultural perceptions still supports the maintenance of kinship networks among young people in China while playing an essential supportive role in the kinship ties of young people today due to its integration of functionalist emotional, material, and relational support. However, individual boundaries, dignity, security, and fulfillment are what young people care about at the individual level. Once this boundary is violated and cumulative damage is formed, young people may disregard the role of kinship support and adopt a strategy of alienation and dilution of kinship. The situation will be further complicated by the return of local and kinship ties, as observed at the group level, where more and more young Chinese have chosen to work within the government and affiliated institutions in recent years due to COVID-19 and the international situation.

Social media is an important venue for expressing the interaction status of young people's relatives, and "online" relationships have become an important indicator to predict changes in young people's kinship relationships

Since Granovetter, many indicators have been developed to understand strong and weak ties, such as temporality, emotional intensity and often classify Internet-based ties as weak and blood-based kinship ties as vital (Krackhardt, 1992). Since 2005, the rapid development of social media has led to an understanding of "relationships" from the perspective of media "infrastructure," i.e., instead of anticipating connections through relationships, such as the

closer the relationship, the more diverse the communications may be but rather anticipating relationships through "communications" (Haythornthwaite, 2002). Our study demonstrates precisely this point: whether young people maintain close contact relationships with relatives can be directly predicted by their online connection relationships and status. The power of connection size was not as good as the predictive effect of group activity, i.e., although both the number of young people's social media connections and group activity significantly predicted their kin connection tightness and tendency to disconnect, in the mediating effects analysis, we found that connection size was not as strong as the effect of group activity on the relationship between cultural values and the disconnection effect. This means that what matters is not how many people are connected but whether they interact substantively with people in their kinship group. Relationships are only meaningful and have greater continuity when "active."

Overall, our study provides an exploratory interpretation of kinship connections among young people in China in the current social and cultural context, i.e., cultural values are still important in sustaining kinship connections, but such connections are being affected by the increasing perception of boundaries and other impairments among young people while exploring kinship networks of young people in contemporary China needs to be examined from the perspective of social media-mediated connections. At the same time, it indicates that the current state of interpersonal relationships needs to be considered from a three-dimensional structure formed by cultural perception + functional satisfaction and burnout + social media. Especially when the state of interpersonal connections in society is closely related to the overall socio-economic development pattern of the country, it is necessary to conduct a multidimensional investigation of the interpersonal connections of Chinese youth today. It is important to note that the factors in this study are categorized into culturalism, functionalism, and behaviorism variables for explanatory clarity, mainly based on the understanding of the model, and the factors selected for each perspective can be considered more multi-dimensionally. Meanwhile, for the functionalism factors considered, kinship support and kinship burnout included three and four secondary variables, respectively. However, the choice to use moderated mediation analysis focusing on the core explanatory variables instead of structural equations in the final model analysis is worth discussing. For example, kinship support includes three dimensions of material, emotional, and relational support, but our study does not show this in detail, which needs to be presented in detail in the follow-up report. Similarly, how the moderating role of the important demographic variables of the study population plays a role in the overall model is a part that deserves additional reporting. In addition, the validity of the critical conceptual measures, such as cultural perception, which are mainly measured by the view of family-state, and the tendency to break off kinship, which is mainly represented by the gathering in the "Spring Festival" ceremony, needs to be verified in the comparison and dialogue with other studies.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the patients/ participants or patients/participants legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Aldridge, D. (1984). Family interaction and suicidal behaviour: a brief review. *J. Fam. Ther.* 6, 309–322. doi: 10.1046/j.1467-6427.1984.00652.x

Barbalet, J. (2021). The analysis of Chinese rural society: Fei Xiaotong revisited. *Modern China* 47, 355–382. doi: 10.1177/0097700419894921

Bayer, J. B., Ellison, N. B., Schoenebeck, S. Y., and Falk, E. B. (2016). Sharing the small moments: ephemeral social interaction on snapchat. *Inf. Commun. Soc.* 19, 956–977. doi: 10.1080/1369118X.2015.1084349

Bian, Y. (2018). The prevalence and the increasing significance of guanxi. *China Q.* 235, 597–621. doi: 10.1017/S0305741018000541

Bian, Y., and Ang, S. (1997). Guanxi networks and job mobility in China and Singapore. *Soc. Forces* 75, 981–1005. doi: 10.2307/2580527

Blake, J. (2022). *Family size and achievement*, vol. *3*. Berkeley, CA: University of California Press.

Bryant, E. M., and Marmo, J. (2009). Relational maintenance strategies on Facebook. *Kentucky J. Commun.* 28:129. doi: 10.1353/kjc.0.0117

Carr, C. T., Wohn, D. Y., and Hayes, R. A. (2016). As social support: relational closeness, automaticity, and interpreting social support from paralinguistic digital affordances in social media. *Comput. Hum. Behav.* 62, 385–393. doi: 10.1016/j.chb.2016.03.087

Chu, R. (2010). *Chinese and Chinese mestizos of Manila: family, identity, and culture, 1860–1930s*. Leiden and Boston: Brill.

Coombs, L. C., and Sun, T. H. (1978). Family composition preferences in a developing culture: the case of Taiwan, 1973. *Popul. Stud.* 32, 43–64. doi: 10.1080/00324728.1978.10412791

Dirlik, A. (1987). Culturalism as hegemonic ideology and liberating practice. *Cult. Crit.* 6, 13–50. doi: 10.2307/1354254

Ebrey, P. B. (1991). *Confucianism and family rituals in imperial China: a social history of writing about rites*. Princeton: Princeton University Press.

Ellison, N. B., Vitak, J., Gray, R., and Lampe, C. (2014). Cultivating social resources on social network sites: Facebook relationship maintenance behaviors and their role in social capital processes. *J. Comput. Mediat. Commun.* 19, 855–870. doi: 10.1111/jcc4.12078

Ennis, E., and Bunting, B. P. (2013). Family burden, family health and personal mental health. *BMC Public Health* 13, 1–9. doi: 10.1186/1471-2458-13-255

Ensle, K. M. (2005). Burnout: how does extension balance job and family. *J. Ext.* 43, 1–15.

Fei, X., Hamilton, G. G., and Zheng, W. (1992). *From the soil: the foundations of Chinese society*. Berkeley: University of California Press, 1–15.

Fulkerson, G. M., and Thompson, G. H. (2008). The evolution of a contested concept: a meta-analysis of social capital definitions and trends (1988–2006). *Sociol. Inq.* 78, 536–557. doi: 10.1111/j.1475-682X.2008.00260.x

Gao, B., Huang, Q., He, C., and Ma, Q. (2015). Dynamics of urbanization levels in China from 1992 to 2012: perspective from DMSP/OLS nighttime light data. *Remote Sens.* 7, 1721–1735. doi: 10.3390/rs70201721

Giskin, H., and Walsh, B. S. (Eds.) (2001). *An introduction to Chinese culture through the family*. New York, NY: SUNY Press.

Granovetter, M. S. (1973). The strength of weak ties. *Am. J. Sociol.* 78, 1360–1380. doi: 10.1086/225469

Greif, A. (2006). Family structure, institutions, and growth: the origins and implications of western corporations. *Am. Econ. Rev.* 96, 308–312. doi: 10.1257/000282806777212602

Gu, M., Ma, J., Teng, J., Gu, M., Ma, J., and Teng, J. (2017). Upbringing methods and educational philosophy for Chinese parents. *Port. Chin. Schools* 6, 95–108. doi: 10.1007/978-981-10-4011-5_6

Hardcore, C, (2023), The wave of kinship disconnection is sweeping China's younger generation, Available at: https://www.bilibili.com/video/av486833151/,2023-5-31

Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. *Commun. Monogr.* 85, 4–40.

Haythornthwaite, C. (2002). Strong, weak, and latent ties and the impact of new media. *Inf. Soc.* 18, 385–401. doi: 10.1080/01972240290108195

Hill, R. A., and Dunbar, R. I. (2003). Social network size in humans. *Hum. Nat.* 14, 53–72. doi: 10.1007/s12110-003-1016-y

Hsu, F. L. (Ed.) (2017). *Kinship and culture*. New York: Routledge, 1–5.

Hu, X., and Han, T. (2022). Youth "broken kin": why does it happen? Where do they go from here? *China Youth Study* 5, 37–43. doi: 10.19633/j.cnki.11-2579/d.2022.0063

Humphrey, L. T. (1979). Small group festive gatherings. *J. Folk. Inst.* 16, 190–201. doi: 10.2307/3813824

Kim, B. S., Atkinson, D. R., and Yang, P. H. (1999). The Asian values scale: development, factor analysis, validation, and reliability. *J. Couns. Psychol.* 46, 342–352. doi: 10.1037/0022-0167.46.3.342

Krackhardt, D. (1992). "The strength of strong ties: The importance of philos in organizations," in *Networks and organizations: structure, form, and action*. eds. N. Nohria and R. G. Eccles (Boston, MA, USA: Harvard Business School Press), 216–239.

Lefley, H. P. (1989). Family burden and family stigma in major mental illness. *Am. Psychol.* 44, 556–560. doi: 10.1037/0003-066X.44.3.556

Levene, J. E., Lancee, W. J., and Seeman, M. V. (1996). The perceived family burden scale: measurement and validation. *Schizophr. Res.* 22, 151–157. doi: 10.1016/S0920-9964(96)00071-0

Liu, Y. (2023). Are young people really starting to break away from their families? *Beijing News*. Available at: http:\\www.weibo.com/ttarticle/p/show?id=2309404903236665737475

Mayhew, B. H., and Levinger, R. L. (1976). Size and the density of interaction in human aggregates. *Am. J. Sociol.* 82, 86–110. doi: 10.1086/226271

Muchon de Melo, C., and de Rose, J. C. (2013). The concept of culture in Skinnerian radical behaviorism: debates and controversies. *Eur. J. Behav. Anal.* 14, 321–328. doi: 10.1080/15021149.2013.11434464

Peiliang, Li (1993). On the concept and proposition of association in Chinese-style sociological research, *Peking University Institute of sociology and anthropology: East-west social research*, Peking University Press

Ponczek, V., and Souza, A. P. (2012). New evidence of the causal effect of family size on child quality in a developing country. *J. Hum. Resour.* 47, 64–106. doi: 10.1353/jhr.2012.0006

Popenoe, D. (2020). *Disturbing the nest: family change and decline in modern societies*. New York: Routledge.

Prandini, R. (2014). Family relations as social capital. *J. Comp. Fam. Stud.* 45, 221–234. doi: 10.3138/jcfs.45.2.221

Redding, G. (2000). What is Chinese about Chinese family business? And how much is family and how much is business?, *Globalization Of Chinese Business Firms*. London, UK: Palgrave Macmillan. 31–54

Sahlins, M. (2011). What kinship is (part one). *J. R. Anthropol. Inst.* 17, 2–19. doi: 10.1111/j.1467-9655.2010.01666.x

Schene, A. H. (1990). Objective and subjective dimensions of family burden: towards an integrative framework for research. *Soc. Psychiatry Psychiatr. Epidemiol.* 25, 289–297. doi: 10.1007/BF00782883

Schwartz, S. (2006). A theory of cultural value orientations: explication and applications. *Comp. Sociol.* 5, 137–182. doi: 10.1163/156913306778667357

Selin, H. (Ed.) (2013). *Parenting across cultures: Childrearing, motherhood and fatherhood in non-Western cultures*, vol. *7*. New York: Springer Science and Business Media.

Shi, T. (1999). *Generational differences in political attitudes and political behaviour in China*, vol. *17*. Singapore: World Scientific.

Shi, J., and Wang, F. (2019). Three-dimensional filial piety scale: development and validation of filial piety among Chinese working adults. *Front. Psychol.* 10:2040. doi: 10.3389/fpsyg.2019.02040

Subrahmanyam, K., and Greenfield, P. (2008). Online communication and adolescent relationships. *Futur. Child.* 18, 119–146. doi: 10.1353/foc.0.0006

Sun, Y. (2023). Why are this generation of young people starting to break up their families? An explanation of three reasons. *Sociological Theory*. Advance online publication. Available at: https://mp.weixin.qq.com/s/oWlwLE5kkUz9ggSfKi1tA

Swenson, D. (2004). *A neo-functionalist synthesis of theories in family sociology*. Edwin Mellen Press. Lewiston, N.Y

Tong, S., and Walther, J. B. (2011). Computer-mediated communication in personal relationships. *J. Comput.-Mediat. Commun.* 53, 1689–1699

Weidenbaum, M. (1996). The Chinese family business enterprise. *Calif. Manag. Rev.* 38, 141–156. doi: 10.2307/41165857

Weiming, L., and Xiaoyu, Z. (2009). Liang Shuming's viewpoint of Chinese and Western cultures in the substance of Chinese culture (SUBS-CC). *Contemp. Chin. Thought* 40, 52–66. doi: 10.2753/CSP1097-1467400303

Wellman, B. (2002). Little boxes, glocalization, and networked individualism. *Digital cities II: Computational and sociological approaches: Second Kyoto workshop on digital cities Kyoto, Japan, October 18–20, 2001 revised papers*, (10–25). Berlin, Heidelberg: Springer Berlin Heidelberg

Xiang, B. (2021), The family: the last refuge or the first front? Young people's "kinship disconnection" is understandable but deserves society's attention, The Paper (Pengpai), (2023), 6–1, Available at: https://baijiahao.baidu.com/s?id=1767492510550523706&wfr=spider&for=pc

Xiao, Y. (2017). Between family and state: Plato's and Aristotle's discourse on family-state relations and its revelations. *Chin. Soc. Sci.* 2017, 159–180. doi: 10.1007/s11469-017-0577-y

Xiao, F., Zhang, J., and Long, B. (2017). The predicament, revitalization, and future of traditional Chinese festivals. *West. Folk.* 76, 181–196. doi: 10.1353/ns.2017.0027

Xu, A., and Xia, Y. (2014). The changes in mainland Chinese families during the social transition: a critical analysis. *J. Comp. Fam. Stud.* 45, 31–53. doi: 10.3138/jcfs.45.1.31

Yan, Y. (2021). *Chinese families upside down: Intergenerational dynamics and neo-familism in the early 21st century* (*42*). Leiden, The Netherlands: Brill.

Yg, Liu. (2023). Are young people really starting to break away from their families? The Beijing News, 5–19. Available at: https://baijiahao.baidu.com/s?id=1766290559158209369&wfr=spider&for=pc

Yus, F. (2011). *Cyberpragmatics: internet-mediated communication in context*. Amsterdam, The Netherlands: John Benjamins Publishing Company.

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Opinion: Care work, migrant peasant families and discourse of filial piety in China

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KEYWORDS

filial piety, care work, discourse analyses, Foucauldian discourse, Chinese migrant workers

Introduction

Filial piety, the core pillar of Confucian ethics, is generally referred to as adult children's attitudes and obligations toward their parents (Bedford and Yeh, 2019). In China, like in most Asian countries, adult children are expected to provide support or care to their parents, especially when the parent is diagnosed of fatal diseases. This tradition was born out of the deep-rooted awareness of filial piety from Confucianism, and is sustained by the lack of an all-inclusive social old-care system in modern times. However, in recent decades, the age-old practice of filial piety has been challenged by the massive migration of the labor force from the countryside to the cities due to modernization and urbanization in recent decades. Studies suggest that Chinese migrant families may renegotiate or reinterpret the Confucian virtues of filial piety in order to adapt to the challenges posed by migration and family separation (Choi and Peng, 2016; Chiu and Ho, 2020). Although there have been extensive discussions of filial piety and care burdens of adult children in China, there is a lack of in-depth qualitative research on the updated perceptions and lived experiences of filial care among migrant peasant workers for their end-of-life parents. Longtao He's book, which grew out of his PhD thesis, is a timely work that addresses this gap. By localizing the Foucauldian discourse analysis framework in the Chinese context, He investigated the experiences and perceptions of filial care among migrant peasant workers who came back home from cities to provide care for elderly parents with advanced cancer. This book would be of interest to students and researchers in care work, migrant workers, discourse analysis and filial piety.

Care work, migrant peasant families and discourse of filial piety in china

The book includes 10 chapters, which falls into two integral parts. The first four chapters are the social, historical and theoretical foundations for this study, while chapters five to 10 are about the specific design and findings of the study.

The book begins with the introduction of the concept of care burden, one of the two key concepts of the study. Here, He introduces the form of informal care and the situation of care burden of Chinese migrant peasant workers and discusses them in the socio-historical context of modern China. However, due to insufficient welfare system provisions for rural families,

the decline in the size of family care and governmental response, the care burden for informal caregivers has been exacerbated. Informal caregivers, especially migrant peasant workers, may encounter more difficulties in sustaining care for their elder parents. This highlights the urgency and value of research into the care burdens of rural adult children in taking care of their ill parents.

Filial piety, another core concept of the book, is introduced in the second chapter. Termed by Confucius over 2,000 years ago, filial piety, as a philosophical, theoretical, and ethical concept, "has been constantly shaped and (re)constructed by various social and political forces over time" (p. 43). This chapter looks back at Chinese history and presents a diachronic trajectory of the evolvement of filial piety in China as a philosophical discourse. From the feudal dynasties to the birth of the People's Republic of China, and later to the period after the Economic Reform (1978), it shows the complexity of filial piety, the changes in its meaning and functions imposed by different social-historical backgrounds, and its overall decline over time. Despite its decline, the country is trying to revitalize the concept and value of filial piety among the people to mediate the old care crisis the society is facing.

Chapter Three provides a literature review concerning the two core concepts in the first two chapters, care and filial piety in China. Based on the current literature, the author identifies several research gaps, including the conflation of filial piety and care, the infrequency of migrant peasant workers as research subjects, and the lack of qualitative studies. More importantly, major Western theories on filial piety so far, such as modernization theory and Intergenerational solidarity theory, fail to examine the highly cultural Chinese context of filial piety. This calls for appropriate localized methodologies for research in care and filial piety in China.

Accordingly, in the next chapter, the author proposes and justifies a localized methodology for the research. Drawing from similarities between Chinese philosophies (Confucianism) and Foucault's theories, he identifies a localized Foucauldian discourse analysis tool for this research. This is achieved through examining the differences and more importantly similarities between Chinese and western philosophies, and between Chinese philosophies and Foucault's theories. According to He, Foucault's theories (on power and truth) are similar with Chinese philosophies that "they recognize the complexity of relationality…, incorporate a pragmatic feature… and reiterate the care of the self" (p. 105).

Chapter Five presents the methodological design of the research, including research aims, research questions, data collection methods and procedures for data analysis. This research aims to explore how participants perceive filial responsibility and the way they are influenced by external factors through a social constructionist qualitative approach. The 4-month fieldwork was conducted in the small city of Langzhong in Sichuan Province, China, wherein there has been a marked increase in the incidence of cancer among its citizens. Instrument tools include in-depth interviews, survey questionnaires, observation and field notes.

The findings of the research are presented in the following three chapters as three paralleled themes emerged from the fieldwork. Chapter Six highlights the challenges the caregivers encountered while providing care for their terminally ill parents, including emotional and physical impact, financial impact, work-related impact and unfinished care impact; furthermore, it finds the mediating role of filial piety in participants' care experiences, arguing that, filial piety "could both buffer and exacerbate care burdens" (p. 170) as it serves both as a resource for educating children and the community, and as a hindrance for the care experience since it could provoke stress. Chapter Seven and Eight illustrate the other two themes: the parental sacrifice discourse and the discourse of forgetting (public forgetting and filial forgetting). The participants adopted both two discourses to make sense of their caring roles and construct their filial selves, and filial piety plays a complicated mediating role in the care experiences for parents with cancer.

Based on the findings presented before, the author answers the two research questions of the research in Chapter Nine. Through relating migrant peasant workers' care experiences with the three conceptual similarities between Foucauldian and Chinese philosophies, it is argued that, "The ancient Chinese philosophies may provide a way to incorporate techniques for care of the self and the construction of free ethical subjects that parallel the way Foucault drew on the strength of parrhesia from ancient Greek and Roman genealogical literature" (p. 252).

The final chapter summarizes the key findings and significance of the study and discusses their implications for policy and practice. To fully understand the discourse of filial piety, as He put it, it's important to not simply blame the neoliberal market economic reform for the decline of filial practice and perceptions, and to acknowledge the complexity of filial piety.

Discussion

This book contributes to scholarship on care work, migrant peasant families and filial piety in several ways. First, the book is a rare combination of care experience, migrant peasant families and advance cancer, each with great socio-economic implications. Compared with urban families, migrant peasant families are marginal and vulnerable groups that are subject to many economic, cultural, and emotional crises. The care work of them for parents with advanced cancer is definitely an understudied topic with great socio-economic and cultural impact. This theme is becoming even more valuable when the current Chinese old-care system is strained and challenged by population aging and dropping fertility rates. As the author argued that, "If migrant peasants' traditionally strongly engrained filial practices and perceptions can change, other demographic groups may also change their relationship to filial piety" (p. 57). The author's explorations into the lived care experiences of migrant workers help create a nuanced picture of the experiences of care workers and their families, highlighting the impact the care work bring and the ways in which care work intersects with culture, history and social norms in modern era. Another strength of the book is its methodological innovations. It has long been a formidable task to examine the discourse of filial piety in China by a single Chinese theory, let alone Western theories. On one hand, endorsed by a long history and changes in feudal dynasties, filial piety carries rich philosophical, cultural and political implications with Chinese characteristics. On the other hand, in the modernization process of China, the country is

inevitably influenced by the West in many ways, making the socio-cultural situation more complex. With a solid literature foundation and theoretical justification, this book creates a framework of Foucauldian discourse analysis that is culturally integrated and appropriate for Chinese characteristics, which contributes to the localization of the Foucauldian theories in the Chinese context and to the refinement of Foucauldian discourse analysis as a qualitative methodology.

The book also advances the discipline of gerontology. By examining how migration and changing family structures impact the provision of care for older adults, the work could contribute to the development of culturally sensitive interventions and support systems for aging populations. Furthermore, there is a call for policy changes that address the unique needs of older adults within this population, such as access to healthcare, social support, and financial assistance. As migration and globalization continue to shape societies worldwide, this book might offer comparative analyses or lessons that can be applied in other regions or countries facing similar challenges related to aging, migration, and caregiving.

Despite the contribution in methodology and specific discipline, the author shows reservations about some culturally/politically sensitives issues discussed in the book, such as the pension scheme and the Cultural Revolution. This concern to some extent prevents further exploration and discussion of relevant topics. Meanwhile, a few issues from the book might need more discussion. This book explores the filial practices and perceptions of migrant workers for parents with advanced cancer, while the parent-child relation or parent-child cohesion before the parent's diagnosis, is not mentioned in the study. Filial perception is a complex term that might be affected by various factors, and the parent-children relationship, especially the relationship with parents in the formative years of the children, may play an important role in affecting and shaping the filial perception and practice of the grown-up children. There might be an interesting question to ask that, if the parent is cold and distant from the child throughout childhood, would the adult child still come back home to the countryside to take care of the ill parent? How filial the child will be? Another aspect of concern is the qualitative features of the study. In this qualitative study based on a 4-month fieldwork, more attention has been given to the interview data and questionnaires from the participants. I would recommend more observation and fieldnotes of the scenes and people around to portray a more holistic picture of the external and internal care experience of the caregivers, such as interactions with other patient families of the same ward, comments from the village neighbors, feelings of the ill parents, etc. Last, the discussions concerning the gendered roles of caregivers in migrant worker families, such as the role and duty of "儿媳/er xi/daughter-in-law" in providing care for the ill parent-in-law, could be extended in future studies. Following the topic of "filial daughter and filial sons" by Miller (2004), "the (un)filial daughters-in-law" would be an interesting topic for future research.

Overall, this book sheds light on a meaningful and understudied aspect of Chinese society and carries implications beyond the Chinese context. Against the backdrop of global population aging, filial piety is increasingly taken as a fundamental family and culture value in aging societies (Pan et al., 2022), and the increased importance of filial piety in both cultural discourse and social practice sets the context for filial piety to be politicized (Du, 2021). This study provides an updated, nuanced and complex picture of the filial care experiences of Chinese care workers and provide a solid structure for future research targeting filial care and practices beyond Chinese cultures. I would highly recommend this book to students and researchers interested in care work, migrant workers, discourse analysis and filial piety.

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References

Bedford, O., and Yeh, K.-H. (2019). The history and the future of the psychology of filial piety: Chinese norms to contextualized personality construct. *Front. Psychol.* 10, 100. doi: 10.3389/fpsyg.2019.00100

Chiu, T. Y., and Ho, E. L. (2020). Transnational care circulations, changing intergenerational relations and the ageing aspirations of Chinese grandparenting migrants in Singapore. *Asia Pac. Viewp.* 61, 423–437. doi: 10.1111/apv.12292

Choi, S. Y. P., and Peng, Y. (2016). *Masculine Compromise: Migration, Family, and Gender in China*. Oakland: University of California Press. doi: 10.1525/california/9780520288270.003.0008

Du, Y. (2021). *State and Family in China: Filial Piety and its Modern Reform*. Cambridge: Cambridge University Press.

Miller, E. T. (2004). "Filial daughters, filial sons: comparisons from rural north China," in *Filial Piety: Practice and Discourse in Contemporary East Asia*, ed. C. Ikels (Redwood City CA: Stanford University Press), 34–52. doi: 10.1515/9780804767163-005

Pan, Y., Chen, R., and Yang, D. (2022). The relationship between filial piety and caregiver burden among adult children: a systematic review and meta-analysis. *Geriatr. Nurs.* 43, 113–123. doi: 10.1016/j.gerinurse.2021.10.024

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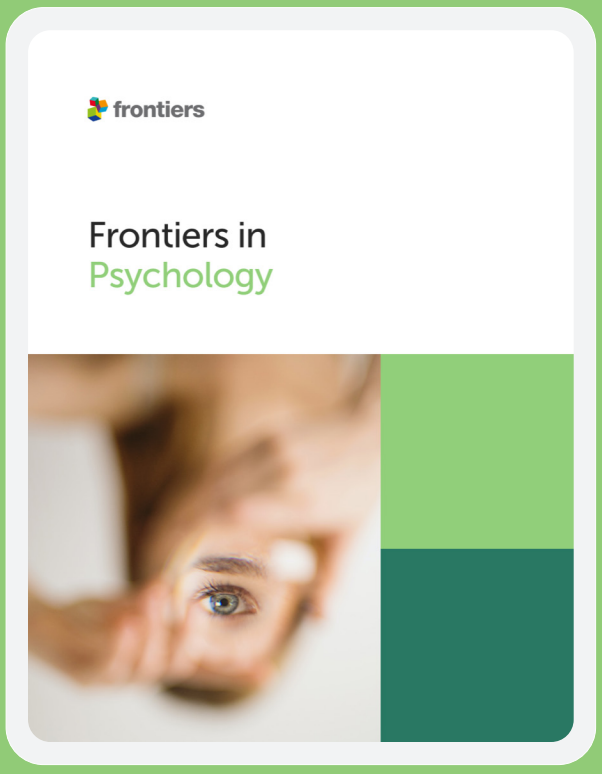

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