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Paradox Lost: Toward a Robust Test of the Chinese Learner

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This article suggests that attempts to date to unravel the paradox of the Chinese learner are incomplete and inadequately modeled, and that the complexities of the paradox have not yet been fittingly operationalized or alternative explanations of research data investigated. It contends that attempts either to state or to unravel the paradox are chimerical, as they risk oversimplifying a complex phenomenon, the extent and nature of which are insufficiently understood to date. The article argues that investigating the phenomenon of Chinese learners' strong performance in international measures of achievement requires researchers to operate more rigorously in their search for alternative and multiple explanations of results in terms of causality, sampling, and representing heterogeneity. Several explanations of data on the paradox are presented, and alternative explanations which might be more usefully explored are provided. The article also questions the extent to which research on the Chinese learner, with a search for a unitary set of characteristics, is not, itself, prey to totalizing, collectivist ideologies cast in unrealistic meta-narratives. Recommendations are made for further research.

Introduction

The search for characteristics of the Chinese learner and its articulation with elements of the Confucian heritage culture (CHC) has been tenacious, and has also given rise to the "paradox of the Chinese learner" (e.g., Watkins & Biggs, 1996) that is informed, in part, by CHC elements.

This article suggests that attempts by researchers, commentators, and educationists to date to unravel the paradox of the Chinese learner are incomplete or inadequately modeled. It argues that the complexities of the Chinese learner paradox have not yet been sufficiently addressed, with incomplete operationalization to date. Further, it suggests that attempts either to state or to unravel the paradox are chimerical and full of aporias, as they oversimplify what is, at heart, a highly complex phenomenon. The article contends that the phenomenon of the Chinese learner exemplifies the need for educational researchers to operate more rigorously and scientifically in their search for alternative and multiple explanations of this phenomenon, rather than to opt for simpler, if seductive, explanations. Explanations to date of such a multilayered phenomenon, while having the allure of parsimony, risk neglecting the weighing of alternative explanations and, thereby, commit the "straw man" fallacy, i.e., setting up an explanation and then seeking only data to support that explanation. Social scientists have a duty to seek alternative explanations. This article suggests several such explanations for the paradox of the Chinese learner.

Celebrated and important attempts to unravel the paradox of the Chinese learner are well documented.[1] However, it is argued here that these represent partial accounts of the paradox and its solution or dissolution. It is important for educationists to ensure that accounts of the paradox and its solution address and judge the several possible explanations available, and put them together to give a multivalent account of the phenomenon, if, indeed, it exists. This article suggests several possible explanations of the phenomenon, and how it might be investigated; there is no single explanation.

Further, while suggesting that meta-analyses or research syntheses of empirical research studies might be an important step forward, the article also questions the relevance and utility, let alone the practicality, of conducting research on so disparate and heterogeneous a population as "the Chinese," and questions whether the search for a unitary set of characteristics is not, itself, prey to totalizing, collectivist ideologies that seek high-sounding, inclusive but questionable meta-narratives.

Chinese Students' Performance on International Measures of Educational Achievement

The paradox of the Chinese learner is intriguing for Westerners and Chinese alike. In a nutshell, it questions why, despite using rote learning, memorization, repetition, constant testing, large classes, competitive motivation, examination orientation, authoritarian and didactic teaching and learning methods, passivity and compliance — in short the presence of putative negative features of teaching and learning, together with a supposed absence of many positive features of effective teaching and learning, Chinese students consistently achieve more highly than their Western counterparts, who are highly adaptive, prefer high-level, meaning-based learning strategies, and engage in deep learning. Briefly, a researcher's task in exploring this phenomenon is to account for: (1) why Chinese learners do so well on (international) tests of achievement; (2) the nature and extent of the pedagogical strategies that have been adduced as part of the phenomenon of the Chinese learner; (3) the relationship between (1) and (2). As will be argued here, these are problematic.

The evidence of achievement is clear: Stevenson et al. (1990) report superior achievement by Chinese students in comparison to American students. Brand (1987) reports that the average mathematics score of Asian Americans, at 518, was 43 points higher than the general average, and that, over a six-year period, 20 Asian American students out of 70 were scholarship winners in the Westinghouse Science Talent Search. He reports that 20% of all engineering students at the University of Washington were of Asian descent, with the figure at Berkeley being 40%; at Harvard nearly 14% of students were Asian Americans, and at Massachusetts Institute of Technology the figure was 20%. In the liberal arts, New York's Julliard School comprised a student body of 25% Asian and Asian Americans.

Stigler and Perry (1990) indicate that, in a test of mathematics, the highest-scoring American students outperformed only one of the twenty classes in Taipei from the first grade upwards, and this applied to all branches of mathematical reasoning. Stevenson et al. (1990) report that Chinese students obtained significantly higher scores in mathematics and reading than did their American counterparts. Cai (1995) found that Chinese students scored considerably higher than U.S. students in computation and simple problem solving in mathematics. S. Lau (1996), Bond (1996), and Wong and Wong (2002) summarize much research to

indicate the outstanding performance of Asian students, particularly in mathematics, in comparison to students from other nations and cultures. S. Y. Lee (1998) reports that students in Taipei, Sendai, and Beijing massively outperformed Chicago students in mathematics at grades 1 and 5, a difference of over 30% at grade 1 and 45% at grade 5, and that Beijing students scored highest compared to students in Taipei, Sendai, and Minneapolis in arithmetic and algebra at grade 4 (pp. 48–49).

Comparative data often come in the form of international studies of educational achievement. (How far these fairly represent what happens in the rest of the students' lives and learning is a moot point, but it is not addressed in this article.) For example: the International Association for the Evaluation of Educational Achievement in 1980 found that, for mathematics, the performance of the top 5% of American students matched that of the top 50% of Japanese students (Stevenson & Stigler, 1992, p. 31). Hong Kong twelfth-grade students in 1987 had mean algebra scores of nearly 80 points, whereas for American students it was 40 points; for elementary functions/calculus, the Hong Kong students scored 60 points, compared to the 30 points scored by their American counterparts. Students in Taipei consistently outperformed students in Minneapolis and Chicago at first-grade and fifth-grade levels for mathematics in 1980 and 1987 (Stevenson & Stigler, 1992, p. 35). Hong Kong students gained the highest scores in the second International Study of Educational Achievement in mathematics (Robitaille & Garden, 1989). China topped the list for the 1992 International Assessment of Education Progress (Lapointe, Mead, & Askew, 1992).

The 1999 Trends in International Mathematics and Science Study (TIMMS) places Singapore, Korea, Taiwan, Hong Kong, and Japan above the United States in mathematics and science. The 2003 TIMMS study presents a very clear picture (see Table 1).

The Programme for International Student Assessment (PISA) study reports that, for 2003, in mathematics, students from Korea, Japan, Hong Kong and Macao, overall were in the top six of the forty countries taking part, with Hong Kong first, far ahead of the United States (Organisation for Economic Co-operation and Development [OECD], 2004). Students from Korea, Japan, Hong Kong, and Macao were in the top six in respect of "space and shape" and in the top thirteen in respect of "change and relationships"; students from Korea, Hong Kong, and Macao were in the top four in respect of "quantity" and in the top five for the area of "uncertainty," i.e., all the four areas of mathematics tested.

Table 1: Results of the 2003 TIMMS study

Position	Country	Score	Position	Country	Score
Mathematics: 4th-grade students			*Science: 4th-grade students*		
1	Singapore	594	1	Singapore	565
2	Hong Kong	575	2	Chinese Taipei	551
3	Japan	565	3	Japan	543
4	Chinese Taipei	564	4	Hong Kong	542
10	England	531	5	England	540
12	United States	518	6	United States	536
16	Australia	459	11	Australia	521
Mathematics: 8th-grade students			*Science: 8th-grade students*		
1	Singapore	605	1	Singapore	578
2	Korea	589	2	Chinese Taipei	571
3	Hong Kong	586	3	Korea	558
4	Chinese Taipei	585	4	Hong Kong	556
5	Japan	570	5	Japan	552
15	Australia	505	9	United States	527
15	United States	504	9	Australia	527

Source: Mullis, Martin, and Foy (2003), pp. 16–17.

Though here is not the place to discuss the strengths and weaknesses of such studies, nevertheless they indicate neatly high levels of this kind of achievement by East Asian students. However, this article unravels some difficulties in providing explanations of Chinese learners and their achievements in such studies; indeed, it suggests that the supposed paradox is not as paradoxical as it appears (see also Dahlin & Watkins, 2000, p. 67), and that attempts to unravel it to date can be characterized by a neglect of consideration of a range of possible explanations.

This article puts forward ten such explanations (social, cultural, pedagogical, curricular, economic) of why Chinese students may do well in international tests of achievement and, in doing so, suggests the need for researchers to seek robustness by examining all possible explanations of this phenomenon and, thereby, to operate Popper's (2002) principle of falsifiability as the touchstone of rigorous science in this field.

Multiple Explanations of the Paradox of the Chinese Learner

What might be the explanations for the paradox outlined above? In providing ten possible explanations here, this article suggests that openness to alternative interpretations and further research are required.

Explanation One: The Premises of the Paradox Are Incorrect

This view[2] argues that rote, repetition, and memorization do not preclude, indeed they can lead to, understanding, deep rather than superficial learning, high-level cognitive strategies and the creation of a "deep impression" of material on the Chinese learner's mind (Dahlin & Watkins, 2000). Cortazzi and Jin (2001) indicate that many Chinese teachers handle large classes in cognitively sophisticated, high-level, involved, and engaging ways. Rote learning and memorization, several authors argue, are not mindless recitation and stuffing the head with little-understood matters, but are part of the process of creating a bright and clear understanding of something (*ming bai*): seeing through it (Au & Entwistle, 1999). Rather, the authors argue that it may be a Western misperception to regard such pedagogies negatively, and that the *order* of learning differs between Asian and Western cultures. Indeed, Gardner (1989) suggests that, in Chinese education, learning the skill precedes creating the new work, rather than vice versa (as in some Western cultures) (cited in Biggs, 1996b, p. 55), and Cai (1995) indicates that Chinese and U.S. syllabuses differ in the timing of the introduction of different mathematical concepts and processes.

To counter this, Morrison and Tang (2002) show that, rather than this being a Western misperception, it is a true perception and held by Chinese themselves: rote learning without deep understanding, followed by forgetting after the examination, is commonplace (p. 290). They report that "students learn in order to pass the tests and then bleach much of the material from their minds; memorization is followed by forgetting, as one respondent [in their research] mentioned: 'after testing they forget all'" (p. 295). Gow, Balla, Kember, and Hau (1996, p. 122) report two studies indicating that "deep" and "achieving" approaches to learning reduce as students progress through tertiary education. Despite

the findings from Morrison and Tang and Gow et al., the other studies above suggest that the premises of the paradox may be misconceived (e.g., Biggs, 1996b; Dahlin & Watkins, 2000, p. 67). Further research is needed here.

Explanation Two: Putatively Discredited Practices Actually Work

A second explanation, perhaps related to the first, is that the methods of teaching and learning, so swiftly maligned in the paradox, actually work. They produce the results. Though the teaching and learning practices described in the paradox may smack of a discredited behaviorism, nevertheless they seem to be producing high levels of achievement on international tests. In other words, it may be an empirical truth even if it is unpalatable to certain educationists. The question that is then posed is whether the end (i.e., the achievement) justifies the means (i.e., the pedagogy). The argument concerns principles and values, not only about what works. "What works" is a deliberative and valuative as well as an empirical matter, and concerns: "what works for whom"; "in whose terms 'what works' is being judged"; "against what criteria are 'what works' being judged"; and "at what cost/benefit is 'what works' being judged." These matters are addressed below.

Explanation Three: East Asian Students Are Brighter

A third possible explanation is that Chinese and East Asian students perform better in the international tests of educational achievement because they are brighter — more intelligent or more capable — than others (see J. Chan, 1996, pp. 104–107; Lynn, 1988; Stevenson & Lee, 1996, pp. 129–131). In this explanation, the tests have done their job well and display effective item discriminability, showing which students in which countries are more able than others. Though this may be absurd or unpalatable to some, smacking of eugenics or the genetic fallacy, nevertheless, in the world of possible explanations, it is a possible explanation. As Russell (1959) remarked: "whoever wishes to become a philosopher must learn not to be frightened by absurdities" (p. 9).

Explanation Four: East Asian Students and Teachers Work Hard to Ensure That the Methods Produce Positive Results

Stevenson and Stigler (1992) found that, for most Asian students, school is far more central to their lives than for American students (p. 54). Stigler and Perry (1990) report that students in Taiwan spent significantly more time in school than American children (a third more school days) and, on average, 1.5 times more hours each week (p. 335). For mathematics and language, fifth-grade students in Taiwan spent 11.2 and 11.4 hours each week respectively, whereas their American counterparts spent 8.2 and 3.4 hours each week respectively; time-on-task was higher for Chinese students (90% for Chinese and 83% for Americans), as was time with the teacher (91% for Chinese and between 87% and 49% for Americans) (Stigler & Perry, 1990, p. 335). Stevenson and Stigler (1992) report that, whereas American students spend half the days each year in school, for Chinese students it was two thirds (p. 53). Stevenson et al. (1990) found that the Chinese mathematics curriculum was not only more advanced than its American counterpart, but that children in Taipei spent more than three times the amount of time each week on mathematics than did their American counterparts (p. 96).

The commitment by East Asian teachers and students to the teaching and learning methods employed extends beyond school hours to homework (Stigler & Perry, 1990, p. 346), private tutorial centers (e.g., Stevenson & Stigler, 1992), and extracurricular classes (a huge industry in East Asian cultures: the "shadow side" of schooling; see Bray, 1999), to buttress up this approach — i.e., to make sure that it works in bringing about high levels of achievement. Brand (1987) reports that Asian American students spend, on average, 11 hours each week on homework, compared to 7 hours each week by other students. Stevenson et al. (1990) report that students in Taiwan spent, on average, four times as much time each day on homework than their American counterparts (p. 43). Whereas first graders in Minneapolis spent an average of 3 minutes on homework each day, for Taipei students it was 40 minutes; whereas fifth graders in Minneapolis spent an average of 20 minutes on homework each day, for Taipei students it was 78 minutes. Stevenson and Stigler (1992) report that students in Taipei spent, on average, 1.9 hours each day on homework and 0.6 hours each day on play, compared to 0.8 hours and 2.4 hours respectively by students in Minneapolis (p. 61). Cai (1995) reports that 72% of students from China

spent 2 hours or more on mathematics homework, in comparison to only 37% of U.S. students studying mathematics for 2 or more hours (p. 26).

This hard work is reinforced by the pressure cooker system of high competition, significant amounts of testing (students taking up to two tests each school day as reported by Morrison & Tang, 2002), and an emphasis on achievement through effort and application rather than ability (W. O. Lee, 1996).

Hard work, as W. O. Lee (1996) remarks, is part of the prevalent CHC feature of "perfectibility through effort"; there are no ceilings on achievements other than those determined by effort, or its lack. Stevenson and Stigler (1992) report that American students gave up faster than Chinese students when faced with a difficult problem, and that, for fifth-grade mathematics students in Taipei, 77% solved the problems that they attempted whereas American students only solved 51% (p. 106). Hong (2001) found that low ability Hong Kong students often worked harder than high achievers (p. 112).

Given this deep-seated cultural resonance between the virtues of hard work, achievement motivation, and the school experience of drill, rote, memorization and repetition, effort and application, it is hardly surprising that Chinese students perform well. This needs empirical testing.

Explanation Five: Students Perform Well Despite Poor Teaching and Learning Strategies

Taking the CHC further, it could be that the teaching and learning methods cited are, in fact, highly inefficient but that students' sheer hard work overcomes the problems with them and this compensates for the poor teaching and learning experienced. Witness the hours and hours of homework that East Asian students undertake from kindergarten upward (Stevenson et al., 1990; Stevenson & Stigler, 1992), one would be seriously alarmed if these hours of work did *not* produce results. This is to suggest that, rather than asking the question posed at the start of this article, a more fitting question might be: "At what cost do these methods produce the results observed?"

To ask whether the methods observed produce the results observed is to pose the wrong question — questions of values, lifelong learning, desirability, effectiveness, and educational worthwhileness are sacrificed to a score on a test. Teachers and students may be working immensely

hard, but at the wrong things; schools and teachers may be placing huge but misplaced demands on students. Teacher become marking machines and students feed them with the marks necessary to run the machine. Again, the veracity of this is an empirical matter.

High scores on a test may be a by-product of a range of other learning that takes place, some of which may be negative — learning may not be for enjoyment or satisfaction. Students may be doing the minimum to "get by" in school, but not enjoying it. Salili, Chiu, and Lai (2001) report that Hong Kong students continue to spend more time on studying than Canadian students, even though their teachers marked their performance much more harshly than did the Canadian teachers (pp. 230, 232). The PISA study indicates that Korea, Hong Kong, Japan, and Macao were in the bottom six of the forty participating countries/regions in respect of the issue "students' sense of belonging to school," particularly in the item "school has given me the confidence to make decisions" (OECD, 2004, Table 3.5). Indeed, Hong Kong and Macao gave the highest marks for the item "I feel like an outsider or left out of things." Students here feel a sense of disconnection from school and a loss of control over their lives in school.

The price of success in international studies of performance, and the curricula and pedagogy that they might reflect, may be high. If so, one could reformulate the paradox of the Chinese learner thus: "why do Chinese students, particularly those living in a consumerist culture, tolerate outmoded, outworn, unacceptable, and inefficient ways of teaching and learning?", or, indeed, do they resist them? As Littlewood (2000) remarks, though East Asian students may be forced to adopt the role of "obedient listeners," it is not one which they take on willingly: "Asian students do not, in fact, wish to be spooned with facts from an all-knowing 'fount of knowledge'" (p. 34).

Conversely, several studies (e.g., S. Y. Lee, 1998; Stevenson et al., 1990; Stevenson & Stigler, 1992) suggest that pedagogical strategies for mathematics in Chinese and Japanese schools, far from being poor, are focused, engaging, interactive, problem-focused, explanatory, thought-provoking, concept-based, procedural, response-oriented, designed to ensure understanding, far more than in American schools. Indeed, Hatano and Inagaki (1998) suggest that differential performance in mathematics of Japanese and U.S. students is primarily due to schooling and teaching-learning practices (p. 82). If this is so, then part of the paradox evaporates.

Explanation Six: The Value of Schooling and Education

Gow et al. (1996), W. O. Lee (1996), and Pratt, Kelly, and Wong (1998, 1999) note the CHC's affirmation of the value of, and respect for, education. Stevenson et al. (1990) indicate that academic achievement is accorded a more central place in Taiwan than in America (p. 6), and Stevenson and Stigler (1992) and Gow et al. (1996) reassert the Asian emphasis on scholastic achievement. Hatano and Inagaki (1998) suggest that Asian culture accords great significance to mathematics learning (p. 96). This is further supported by theories of human capital in which, as Woodhall (1997) reports, investment in human capital through education brings greater returns to individuals in developing rather than developed countries such as those of Europe and the West (p. 220). One can still educate oneself out of poverty in East Asian countries (e.g., Stevenson & Lee, 1996), a feature which is less clear-cut in those developed nations of the West in which chance and socio-economic status at birth play a significant role (see Halsey, Heath, & Ridge, 1980; Jencks, 1972; Woodhall, 1997). East Asian students may still look to education as a passport out of poverty and toward improvements in life chances.

This is compounded in East Asian societies in which there is restricted access to higher education and competitive entry is strong for secondary education (see comments on mainland China by Stevenson & Lee, 1996, p. 129) and in which there are scarce university places (Gow et al., 1996, pp. 115–116; Stevenson & Lee, 1996, p. 134). Little wonder is it, therefore, that students strive to perform highly. In situations of limited university places, the zero-sum model still operates: my gain is your loss, and students, keenly aware of this, must beat the others in order to succeed. And they succeed by outperforming their rivals in tests and examinations. In schools too, teachers, students, and parents use marks as measures of people; one has to strive to be the top of the class.

Explanation Seven: The Contents of the Tests Are Suited to the Contents of Chinese Students' Learning and Curricula

The reason why Chinese learners do so well may be because the items that appear on the tests conform to the contents of Chinese students' curricula (e.g., Cai, 1995; Wong, 2000). This rehearses the familiar issue

that whether students do well or badly on test depends on the similarity between the syllabi/curricula followed and the test contents. Put simply, Chinese students may do well on international tests of performance because the international tests of performance measure those items at which Chinese students excel and which they have studied. They are like school. Indeed, Stigler and Perry (1990) comment that Chinese teachers emphasize fast and accurate performance and getting the right answer, with 17% of mathematics time spent on mental calculation, a phenomenon not found at all in American classrooms (p. 341). Were the tests to include other kinds of items, then the Chinese students' performance may not be so spectacular, though Biggs (1996b) contests this. Indeed, Cai (1995) found no appreciable difference between Chinese and U.S. students on open-ended, more complex mathematical problems (p. 56). The argument here is that it is precisely because of the teaching, learning, and curricula to which Chinese learners have been exposed that they do well. Standardized tests, standardized curricula, standardized teaching suit standardized minds (see Sacks, 1999); there is no paradox at all, as they all complement each other very comfortably. As before, this is an empirical matter.

Explanation Eight: Chinese Students Are Good Test-takers

In this explanation Chinese students may be schooled into the culture of tests and may become excellent test-takers even though the results may have few and limited spillover effects in real life. Stigler and Perry (1990) indicate that 7% of all segments of mathematics lessons in Chicago were devoted to evaluation, but the figure was 18% for students in Taipei (p. 342). Weeden, Winter, and Broadfoot (2002) remark that there are several key possibly unintended consequences of assessment: "If important decisions are presumed to be related to test results, teachers will teach to the test. Scores may rise without skills improvement…. In every setting where test results are important, a tradition of past examinations develops which eventually *de facto* defines the curriculum" (p. 34). Chinese students, tested ad nauseam (Lewin & Lu, 1990; Morrison & Tang, 2002), may be excellent test-takers in competitive, examination-oriented education systems (e.g., Gow et al., 1996). It is hardly surprising that they do well in international tests; they have been groomed for them on a daily basis in a marks- and test-oriented culture.

Indeed, one can take issue with Biggs (1996b), Dahlin and Watkins (2000), Marton, Dall'Alba, and Tse (1996), and Mok et al. (2001) in their suggestion that understanding accompanies rote and memorization. While they may be correct, understanding alone may not be enough; *application* in real life is required, and international studies of achievement are no test of this. Indeed, the daily tests that students take may be similar to the international tests, not only in their contents but also in their applicability (or its lack) to the everyday world — i.e., they are inauthentic and deal in inert knowledge. Chinese learners may do well in tests but not in everyday living or application. This needs empirical investigation.

Despite this, students, their parents, and their teachers are caught up in the regimen of marks and competition, in which (perhaps caricaturing the situation for conceptual clarity) either one is top, or nearly top, or one is a failure, with the concomitant shame brought to family and school. As W. O. Lee (1996) remarks, in Chinese culture, not doing well is not only a personal matter but is also letting down the family and one's teacher in a society in which relationships with family and teachers are highly significant and sensitive.[3] Again, empirical verification of this is required.

Explanation Nine: The Hawthorne Effect

Students across the world rise to the occasion of an examination. Chinese students may be no different in this respect; indeed, given the emphasis on competition, frequent examinations and high-stakes testing in East Asian contexts, it would be surprising if the Hawthorne effect were not considerable here, perhaps even stronger than in other parts of the world. With so much hanging on "performance" (not least for university entrance) — Salili (1996) and Shi et al. (2001) suggest that "performance" and "achievement orientation," rather than, for example, task goals, are powerful features of Chinese learners — it would be remarkable if Chinese students were *not* to take examinations very seriously.

Explanation Ten: The Results Are Signifiers of Chinese Culture

There are several features of the CHC and its educational manifestations,[4] including, for example:

- Modesty, conformism, docility, obedience to authority, unquestioning "filial piety" (regardless of actual teacher behavior), loyalty, respect for elders;
- Order and hierarchy;
- Concern for face and relationships;
- Motivation through the avoidance of a "sense of shame" and the gaining, giving and saving of "face";
- Respect for education and academic excellence;
- Imitation (mimesis) as a requirement for learning and development;
- The malleability of human behavior;
- The significance of the collective as well as the individual, with an emphasis on the need for individual effort to serve the collective good;
- An increasing significance given to respecting the individual and the individual's self-management;
- "Perfectibility through effort" — there are no ceilings on performance, and success is possible if enough effort is exerted, rather than through innate ability;
- Increased effort pays dividends in performance;
- Persistence and perseverance — the need to continually strive, never give up and never be satisfied with present performance, even when it is already of high quality;
- The value of hard work for the application of ability;
- An acquisitive and accumulative view of knowledge: a banking conception;
- A view of textbooks as major sources of knowledge;
- Hierarchical student/teacher relationships, with respect for, and a lack of challenge to, the rank and to the teacher/authority/seniority — i.e., the teacher as the authority and decision-maker;
- Conflict avoidance;
- An "empty vessel" view of knowledge and learners (with an emphasis on the quantity of learning);
- Teaching as transmission and smooth delivery, largely of lectures, with teachers being largely responsible for successful learning;
- The operation of a control model of teaching and learning;
- Tests, grades, competition and cramming;
- Four R's — reception, repetition, review, reproduction;
- Drill, rote, memorization, recall, repeat;
- Four M's — meticulosity, memorization, mental activeness, mastery;

- Little tolerance of ambiguity (the search for the single "right answer," as in a test).

While it is dangerous to provide simplistic lists of characteristics *as if* they were exact and empirically true, nevertheless, for conceptual and heuristic clarity, the conjuncture of the CHC and educational practice might ensure that the methods of rote, memorization, drill, and repetition work here to effect student achievement. Culture and educational practices are sympathetic to each other and mutually potentiating.

However, the extent of the CHC is a matter of conjecture. Pratt et al. (1999) question how far any contemporary East Asian society can be characterized as Confucian, arguing, for example, that, in Hong Kong, family and the central values within it — of "loyalty, duty and obedience" — follow not only from the CHC but from a person's "sense of place, identity, and responsibility in relation to family" (p. 254; see also Chang, 2000; W. O. Lee, 2005; Wong & Wong, 2002). Wong and Wong (2002) and Wong (2004) suggest that several of the CHC elements derive from sources other than Confucianism and that the writing of Confucius are open to different interpretations; Chang (2000) suggests that it is more fitting to talk of "vernacular" rather than "academic" Confucianism (p. 137).

Further, some Chinese cultures have a comparatively long history of contact with societies in which ascription has been replaced by achievement and in which "organic solidarity" has replaced "mechanical solidarity" (Durkheim, 1933). The issue here is that alternatives to the obedience- and ascription-oriented CHC exist; it is not universal in Chinese culture. Hong Kong, Taiwan, Singapore, and Chinese communities in the West, while they may practice the CHC, are also exposed to consumerism, commodification and consumer power. Indeed, the Chinese mainland has been moving toward state-mandated capitalism and greater openness since Deng Xiaoping's tenure of office.

The consumerist, competitive society, alongside the CHC, lays emphasis on marks, measures, achievement, and performance; Morrison and Tang (2002) report in their study of Macao that it is as if the education system, curricula, students, and teachers *depend* on these for survival. *Teachers* depend on testing for contract renewal (test scores must be high or else their contracts are not renewed), to ensure that students learn, for control of large classes, and to gain income from private lessons (to ensure that students do well in school tests). *Students*

depend on testing for graduation, reasons/motivation to learn, to define what is worth learning, and to give meaning to their experience in school. *Principals* and *senior teachers* depend on testing to control teachers (by contract renewal that depends, in part, on high test scores), to meet parental wishes, to guarantee and indicate putative high standards, and to control syllabuses. *Curricula* rely on testing for reinforcement, control, and legitimacy. *Pedagogy* relies on testing to reinforce traditionalist, didactic, rote and drill learning with an emphasis on memorization, whether or not there is understanding. *Schools* rely on testing (test results) to attract students and promote their reputations. *Management* of large classes relies on testing as a control mechanism. The system is circular and hermetic. Testing is what the consumers want. Little wonder that Chinese students do well in tests.

These ten possible explanations, while research may qualify them, suggest that researchers should not foreclose the investigation into the paradox of the Chinese learner and spectacular performance, and that a full scientific investigation should weigh the evidence, the warrants, and the alternative explanations of the phenomenon. Which ones explain most fully and fittingly the situation found is an empirical question. Simple or single explanations of this multi-layered phenomenon are elusive.

Further Difficulties in Researching the Paradox

The complexity of the situation is compounded by difficulties with the research studies in the field,[5] including:

- the assumptions made about Chinese learners;
- ambiguity of focus;
- sampling in the studies;
- problems of causality;
- problems of curriculum sampling.

Chinese make up around one quarter of the world's population. The make-up of Chinese nationals living in China, or the Chinese diaspora across the world, is heterogeneous and disparate. To treat them as a single, homogeneous group may be to seriously misrepresent such diversity. Differences within and between groups of Chinese is an important issue. Who, exactly, are the Chinese (Chang, 2000)? What is "Chineseness"? Whom, exactly, do the studies represent (see Chang,

2000; Stevenson & Lee, 1996, p. 124)? The risk of stereotyping looms large when one attempts to research "*the* Chinese learner," as though it were possible to characterize massive heterogeneity within a single phrase or singular definite article. It would be as invidious as asking for the characteristics of the African learner or the American learner; it is simply not possible to do so other than at such a level of generality as to be of questionable utility. This suggests that the enterprise either of framing the paradox of the Chinese learner or seeking its solution may be founded on a premise that is alluring, but ultimately unhelpful, for researchers.

Secondly, when one examines the Anglophone studies that have been conducted, it is noticeable that many are conducted on small samples, and that these studies do not indicate the populations or population sizes from which they were drawn, i.e., they are small-scale opportunity samples with no ability to be representative. For example, some studies are conducted with Chinese living in largely non-Chinese societies (e.g., Brand, 1987; Pratt et al., 1998); others use small or highly selective samples of students in higher education, international schools, or schools outside China; others, as Gow et al.'s (1996, p. 123) report, are Hong Kong-based. In the study reported by Stigler and Perry (1990, p. 333), ten schools in Taipei participated; the study by Stevenson et al. (1990) was on students in Taipei; the study by Marton et al. (1996) was of 18 teacher educators; the study by Au and Entwistle (1999) was of 94 school students; studies reviewed by Gow et al. are from Hong Kong. The study by Dahlin and Watkins (2000) was of 48 students in Hong Kong secondary schools and 18 German students in a Hong Kong German-Swiss international school, and the study by Zhang and Carrasquillo (1995) was a review of Asian Americans. The study by Salili et al. (2001) was of Hong Kong, Canadian, and East Asian Canadian students studying in Montreal. None of these can be said to be a representative or sufficiently large or sufficiently stratified sample of Chinese students. Of course, there are exceptions (e.g., Cai, 1995; Stevenson & Stigler, 1992).

The study by Cortazzi and Jin (2001), of 135 university students and an undisclosed total number of primary school classes in northern China (though nine classes are studied), is one of the few to report actual school practice rather than using interview-based reporting. The study by Shi et al. (2001) is of 1,331 students in a single Beijing middle school. *Pace* Cortazzi and Jin, Stevenson and Stigler's (1992, p. 115)

brief comment on students in Beijing, Cai (1995), and the study of Beijing students by Shi et al., studies in Anglophone journals tend not to be about the Chinese mainland. Some of these studies are of college and higher education (e.g., Kennedy, 2002; Pratt et al., 1998, 1999), and others are of school students (e.g., Dahlin & Watkins, 2000; Littlewood, 1999, 2000), i.e., the focus is disparate; other papers are reflections, comments, and discussions of others' empirical work (e.g., the meta-analysis of Biggs, 1996b, and the review of Gow et al., 1996) rather than being, themselves, empirical.

One can raise the questions "What are the populations that these samples represent?" and "Are these samples sufficient for generalizations to be made?" (and studies of *the* Chinese learner surely are seeking generalizations). Are the characteristics of Chinese students in Taiwan similar to those in Singapore, Urumqi, Beijing, urban and rural China, Texas, Vancouver, England, Australia, and so on (Chang, 2000, p. 133; Stevenson & Lee, 1996, p. 124)? As Chang (2000) notes, current definitions of "Chinese" are "searching in the wrong places." While accepting the view of Chang (2000) that being Chinese is an ethnic, valuative, and cultural, rather than a demographic, designation, and the view of Watkins and Biggs (2001) that "the 'right places' are where the Chinese identify themselves as being Chinese in places where they normally exist, in classrooms not in laboratories, and who describe themselves using constructs contextualized within their community" (p. 4), this does not overcome the issue of heterogeneity and diversity. There is clearly a need to conduct a meta-analysis or research synthesis of studies in order to look for commonalities and patterns (if, indeed, that is deemed useful).

The issue here is that if one wishes to study such a putative singular phenomenon as "*the* Chinese learner," then one has to delimit the study, which then raises problems of generalizability, or one has to conduct large-scale multinational studies, which risk loss of the very specificity necessary for detailed characteristics to be given: witness the celebrated study by Hofstede (1980) whose generalized scales of power-distance, individualism/collectivism, masculinity/femininity, and uncertainty avoidance tend to be useful as orienting, background perspectives rather than detailed analyses. Small may not be beautiful, but neither may be big. Meta-analyses or research syntheses of multiple studies would also be useful here, but these are insufficient to date.

Is it actually worthwhile to seek to define a set of characteristics of the Chinese learner? Clearly it may be useful to understand the culture and its appropriate pedagogies. On the other hand, is this not falling into the totalizing, universalizing, possibly ideological nomenclature and practice of meta-narratives, homogenization and collectivism, truly bearing out Deng Xiaoping's ideological and inclusive/hegemonic desire to build socialism with Chinese characteristics? Ideology here is defined as: (1) that set of values, be they true or false, which emanate from, and support or legitimate, a dominant group in society; (2) those values which are *imposed* by a dominant group — with subordinate groups (classes, cultures, communities) compelled to adhere to them; (3) those values which can be accepted *with the apparent agreement* of all participants (the operation of hegemony) (Eagleton, 1991). The idea of the Chinese learner being in thrall to a single, privileged, dominant or dominating ideology or set of practices could be repellent to many.

Setting aside the ideological dimension, witness the difficulties in identifying, for example, a single "black" culture or "African" culture, is it not more productive to recognize and work with diversity, unless, of course, it can be shown that such a phenomenon as "the Chinese learner" exists, which is an empirical matter? If this latter turns out to be the case, then it is truly remarkable, given the diversity and heterogeneity of the Chinese, and raises an alternative paradox to the one that is the main theme of this article, thus: "How is it that commonalities and uniformity exist in Chinese learners when there is such a diversity of Chinese cultures within and across Chinese societies?" Put another way, "How does one explain uniformity in the midst of such diversity in Chinese societies?" Is this evidence of a deep-seated conformity or a heavily imposed, totalizing control mentality, or something else?

Thirdly, the empirical literature on Asian learners and international studies of student achievement is not confined to specifically Chinese learners, indeed the Chinese mainland did not participate in the TIMMS and the PISA 2003 studies. This suggests that what is being researched may not be a Chinese phenomenon after all, but an East Asian phenomenon. Indeed, the studies by Cai (1995), Hatano and Inagaki (1998), Littlewood (2000), Mayer, Tajika, and Stanley (1991), Stevenson et al. (1990), Stevenson and Stigler (1992), and Stigler and Perry (1990) reinforce this view.

Fourthly, problems of causality exist. Let us imagine that it were possible to identify a universal set of characteristics of the Chinese learner. It is a leap of faith to move from such a set to any suggestion of causality between these and the results of achievements on international tests. One has to ask: "Of what are the international studies of educational achievement really indicators?" Any correlations — positive or inverse — between such characteristics and student achievements may be misleading. This is not only because of the familiar point that correlation does not imply causality, but also because the dependent variable of student achievement is the outcome of multiple independent variables, of which characteristics of the Chinese learner are only a part. One would have to be equally circumspect about inferring that the lower position of students in the United States, England, or Australia in international studies of educational achievement is in any way an indication that the pedagogical strategies or the cultural characteristics in those countries are *not* working. To seek the simple causality or significant correlation implied in the paradox of the Chinese learner is spurious; it is bad science. I may find that factor *X* correlates highly with factor *Y*, but they are completely unrelated; the time I go to bed at night may correlate positively or negatively with my ability to read a book on astrophysics (about which I may know nothing), but the two, in reality, are unrelated.

There are very many intervening, process variables operating in the putative paradox; the situation is not as simple as the framing of the paradox suggests. It is not simply that one set of inputs (given characteristics of teaching and learning) produces one set of outcomes (high performance on international tests); it is that there are many complex processes at work that mediate the input variables, including culture, interpersonal relationships (and the five main sets of relationships in the CHC as indicated in Pratt et al., 1998), the expectations of all stakeholders, resources, class size, values, and so on.

Fifthly, to assume that a simple linear relationship exists between independent and dependent variables, when learning and performance are non-linear, mutually informing, dynamical systems, is to premise educational discourse on untenable views of causality in a complexity-driven world marked by multi-directional causality. Input-output models of teaching and learning are redolent of discredited behaviorist models. As Chomsky's (1959) withering critique of Skinner's behaviorism argued, we simply cannot infer causes from effects. Indeed, the

successionist conceptualization of causality (Harré, 1972), wherein researchers make inferences about causality on the basis of observation, has limitations in really understanding *how* an intervention or set of actions actually work in practice, and yet it is precisely this *explanatory* understanding that is required. To date, works by Biggs (1996b), Cai (1995), Stevenson et al. (1990), and Stevenson and Stigler (1992) address this in part, but much more is required here.

Sixthly, currently most studies of Chinese learners and their achievements compared to American and other countries have focused largely on mathematics, less so on science, and even less so on other subjects. A research exercise is important to investigate Chinese learners' characteristics across the whole curriculum. What would Chinese students' achievements be in music, history, literature, religious studies and others, and how do they learn these subjects? This is an area in need of investigation. It is dangerous to generalize about Chinese learners on the basis of a limited number of curriculum areas. Currently, comparative research has been conducted in those areas that are, arguably, more culture-free than others. Moving to other areas of curriculum achievements invites questions such as "whose history?", "which music?", "whose literature?", and the suchlike. Cross-cultural comparison is difficult here; studies of Chinese pedagogy would be useful in such areas. Further, studies to date have not covered the complete age range or grade range of schooling or tertiary education; it is invidious to make generalizations about the Chinese learner in the absence of such data.

Despite ground-breaking work reported in Watkins and Biggs (1996, 2001), it is still only breaking the ground rather than being able to go as deeply into the issues as they require. The understanding of the Chinese learner, and whether there is or is not any paradox, is still a comparatively opaque black box, disabling the identification of detailed causal mechanisms that produce treatment effects (Clarke & Dawson, 1999, p. 52), and it is precisely these detailed mechanisms that we need to understand in complex situations.

Seeking a Research Enterprise

To conduct even the most rudimentary representative research entails a vast research exercise. For example, to fully seek *disconfirming* as well as confirming data could be undertaken in a natural quasi-experiment on

the Chinese learner and student achievement, At its simplest this could take the form a factorial, possibly ex post facto, research design using and not using rote learning, memorization, repetition, constant testing, large classes, competitive motivation, examination orientation, authoritarian and didactic teaching and learning methods, passivity and compliance (Table 2).

Table 2: A Simple Factorial Design to Investigate the Paradox of the Chinese Learner

	Low school performance (or low ability)	Medium school performance (or medium ability)	High school performance (or high ability)
• Chinese students using the methods of the Chinese learner.			
• Chinese students *not* using the methods of the Chinese learner.			
• Non-Chinese students using the methods of the Chinese learner.			
• Non-Chinese students *not* using the methods of the Chinese learner.			

Here both Chinese and non-Chinese students are necessary in the research for the basis of fair comparison, and, for the same reason, Chinese and non-Chinese students following particular pedagogic strategies are separated. Further, three groups of student abilities have been indicated (low, medium, and high) and these, it is suggested, can be defined by performance in school or by some other indicators. The relationships of these effects on student achievement (however defined) would then need to be investigated. The issue raised here is that it is possible that the results are differentiated according to ability groups, an issue that seems not to be addressed in international measures of achievement (*pace* Cai, 1995) and in studies of the Chinese learner

(which corresponds, perhaps, to the Chinese emphasis on effort rather than ability).

Of course, there is a danger here that this risks the self-fulfilling prophecy: students identified as high on measured ability may turn out to be high performers in school, and vice versa (i.e., the research simply finds the obvious), or the identification of students with low, medium or high ability may be as a result of the very tests which the study seeks to address as outcomes variables. However, the notion of separating out students into putative ability groups avoids the over-aggregated and averaged research results that characterize many international studies of educational achievement in which students are not differentiated but grouped together as though they were more or less homogeneous.

A Popperian "severe test" of the viability of the construct of "the Chinese learner" is an empirical matter that seeks falsification, as stated throughout this article, and this is a vast undertaking that has been insufficiently addressed in research designs to date. Much research to date has been illustrative and exploratory, with inferences and conclusions about generalizability often exceeding the capability of the data to support them, though S. Y. Lee's (1998) comments on having tested 24,000 students in ten sites are encouraging (p. 47).

A research exercise would need to look at actual classroom practice (as did Cortazzi & Jin, 2001, and Stevenson & Stigler, 1992) on a large scale. It is also important to ask *students* directly about the links between elements of the CHC and their test and examination performance, to ask them *directly* how they prepare for such tests and examinations, how they learn, and why they choose the methods that they employ — i.e., to establish links from the participants themselves rather than their teachers or by research inference. Such studies could stratify across different groups of Chinese, with cautions indicated about generalizability.

Conclusion

It is being suggested here that it is unacceptable to seek research which deliberately or de facto (in outcome, functionalistically) *confirms* the paradox of the Chinese learner. It is important to conduct research which seeks either to *disconfirm* the notion of the Chinese learner or to disconfirm any causal relationship that it may have with student

performance. Confirmatory research alone is weak, a straw man seeking straw evidence.

Much research to date has been of an exploratory nature rather than testing of hypotheses or their qualitative, non-positivist equivalents. It is premature to consider the paradox either solved or dissolved, and future research must pursue it with the robustness, rigor differentiation and sensitivity that is deserved. Further, this article has suggested that it may even be a fruitless and misconceived exercise, because of problems of generalizability. Researchers are not yet in a position to make any secure or definitive statements about the Chinese learner; there is simply insufficient evidence. Even if these aporias are rectified, there may be many good reasons to be very cautious when attempting to go further in this field.

The article has suggested the importance of reconceptualizing the paradox of the Chinese learner into explanations of why there should be any common characteristics at all, given that Chinese societies are so dispersed, disparate, and heterogeneous. It has cautioned that to seek such commonalities might be to perpetuate the very totalizing, ideological controlling and collectivist meta-narratives that the paradox seeks to understand. In this sense research into common Chinese characteristics is, itself, not only an ideological enterprise but an ideological exercise in reproduction. It is a clear example of Giddens's (1979) principle of structuration, in which the research activity itself is both the medium and outcome of an already-existing phenomenon or ideology: a collectivist and totalizing culture in which a seeming, but questionable paradox and ideology are perpetuated.

This article has suggested that, with some exceptions, in fact educationists and researchers do not yet know enough about the Chinese learner, how the learning is undertaken, how it relates to teaching, how it relates to the classroom environment, to culture or to resources, to be able to say with any certainty either what the characteristics of the Chinese learner are or whether it is a field of study that can free itself of ideology.

Notes

1. See Au and Entwistle (1999), Biggs (1996a, 1996b, 2001), Biggs and Watkins (2001), Cortazzi and Jin (2001), Dahlin and Watkins (2000), Kennedy (2002), Marton, Dall'Alba, and Tse (1996), Mok et al. (2001), Pratt, Kelly, and Wong (1998, 1999), and Watkins and Biggs (2001).
2. See Au and Entwistle (1999), Biggs (1996b), Cai (1995), G. Y. Chan and Watkins (1994), Dahlin and Watkins (2000), Gow, Balla, Kember, and Hau (1996), Kember and Gow (1991), Marton et al. (1996), Pratt et al. (1999), Stevenson et al. (1990), Stevenson and Stigler (1992), Stigler and Perry (1990), and Watkins and Biggs (2001).
3. See Gu (2001, chap. 13), W. O. Lee (2005), Salili et al. (2001, pp. 223–225), Stevenson and Lee (1996, p. 134), and Stevenson and Stigler (1992, p. 93).
4. The list of features derives from Bond (1991, 1996), Bond and Hwang (1986), Brand (1987), Gu (2001), Ho (1986), Hong (2001), Hu (2002), Kennedy (2002), A. Lau and Roffey (2002), S. Lau (1996), W. O. Lee (1996, 2005), Littlewood (1999), Pratt et al. (1998, 1999), Salili et al. (2001), Salili and Hau (1994), Stevenson and Lee (1996), Stevenson et al. (1990), Stevenson and Stigler (1992), Stigler and Perry (1990), Wong (1998, 2000, 2004), and Wong and Wong (2002).
5. See Au and Entwistle (1999), Biggs (1996a, 1996b), Biggs and Watkins (2001), Cortazzi and Jin (2001), Dahlin and Watkins (2000), Kennedy (2002), Marton et al. (1996), Mok et al. (2001), Pratt et al. (1998), Stevenson et al. (1990), Stevenson and Stigler (1992), and Watkins and Biggs (2001).

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