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REGULAR ARTICLE

Reading Performance and Self-regulated Learning of Hong Kong Students: What We Learnt from PISA 2009

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Abstract The outperformance of Chinese students in large-scale international assessments has increasingly attracted the attention of researchers. This study explored the relationship between an important student factor, self-regulated learning (SRL), and Hong Kong students' reading performance on Programme of International Student Assessment (PISA). Using data from PISA 2009, this study found that Hong Kong students obtained an overall strong performance on the PISA 2009 reading assessment. They were relatively good at reflecting and evaluating and reading continuous texts. Compared with the OECD average, Hong Kong students showed better reading engagement and perceived a more positive classroom disciplinary climate in their reading lessons, but they used fewer control strategies, had poorer awareness of effective reading strategies, and perceived a lower degree of teacher stimulation and scaffolding. Reading enjoyment and control strategies were the most important SRL components facilitating Hong Kong students' reading performance, after controlling for other background variables in multilevel analysis. Possible cultural and contextual factors affecting Hong Kong students' SRL and reading performance, and their relationship are discussed to shed light for understanding the paradox of Chinese learners and improving the instructional practices in Chinese classes.

Keywords Chinese culture · Hong Kong students · PISA · Reading performance · Self-regulated learning

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In recent years, evidence of the strong academic performance of students from Chinese and East Asian societies, which are rooted in Confucian Heritage Culture (CHC), has been clearly demonstrated in large-scale international assessments, such as the Programme of International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS). The superior academic achievement of Chinese students has aroused the interest of researchers on the paradox of Chinese learners, who have long been stereotyped as passive, rote learners but perform much more strongly than their Western counterparts (Ho 2009; Morrison 2006). Institutional and resource factors do not likely account for their strong performance because certain contextual features shared by these countries (e.g. large class sizes, ability sorting, small public expenditures on education) are considered unfavourable for student learning (Hojo and Oshio 2012; Lee 2014; Leung 2002). Most discussions have focused on how teaching practices and student characteristics under the influence of CHC affect students' learning and performance. Many researchers attribute Chinese students' superior academic achievement to the emphasis that CHC places on education and effort (Jeynes 2008; Morrison 2006; Zhang and Kong 2012). Because of this emphasis, Chinese parents, teachers, and students all have a strong conviction that students should work hard to perform well on competitive examinations. Conversely, emphasis on conformity and respect for authority in CHC is criticized as encouraging passive, rote learning without developing students' higher order and critical thinking skills (Gow et al. 1996; Ho 1994, 2009; Ho et al. 2001; Littlewood 1999).

Herein, we explore the relationship between an important student factor, self-regulated learning (SRL), and Hong Kong students' reading performance on PISA 2009.

SRL is widely viewed as crucial to successful learning (Perry et al. 2004; Pintrich and Zusho 2002). Measures of SRL were included in the PISA 2009 Student Questionnaire as an important factor in students' reading performance. The emphasis on students' active role in SRL (Paris and Paris 2001) seems to contradict the traditional view of teaching and learning in Chinese classes. This paper addresses two controversial discussions on Chinese learners. First, by comparing the SRL indices of Hong Kong students with their counterparts in other East Asian and top-ranking Western countries, we explore whether stereotyped impressions of Chinese learners remain valid in today's Hong Kong. Second, since Hong Kong was a high-performing region in PISA 2009, the relationship between its students' SRL and reading performance is examined to explore whether the proposed positive effects of SRL on student learning could be applied in explaining the high performance of Chinese students.

Self-regulated Learning and Chinese Learners

SRL is an active process whereby learners set goals for their learning, and monitor, direct, and control their cognitive processes, motivation, and actions to achieve these goals (Paris and Paris 2001; Pintrich 2000; Pintrich and Zusho 2002). Over the past decade, the definition of SRL has broadened to encompass strategy, metacognition, and motivation (Butler 2002; Winnie and Perry 2000; Zimmerman 2001). Early conceptualizations of SRL focused on cognitive and metacognitive features. Cognition concerns the application of different cognitive strategies for learning. Metacognitive strategies are used to control and regulate cognition. Self-regulated learners are strategic learners, skilful in choosing a repertoire of effective learning strategies to suit the task and applying them appropriately (Dignath and Buttner 2008; Perry 1998; Perry et al. 2007; Zimmerman and Martinex-Pons 1988). In recent years, motivational variables have been integrated into SRL as possible prerequisites of strategic processes. Growing evidence suggests that SRL processes and motivational beliefs are reciprocally interactive (Efklides 2011; Schunk and Ertmer 2000). To become self-regulated learners, students also need to be self-efficacious, intrinsically motivated, and persistent when facing difficulties (Dignath and Buttner 2008; Paris and Paris 2001; Perry 1998; Perry et al. 2007).

These major components of SRL are essential to students' reading development (Horner and Shwery 2002; Housand and Reis 2008; Paris and Paris 2001; Perry et al. 2007). Many previous studies have supported significant relationships between students' use of reading strategies, motivation, and comprehension (e.g. Borkowski 1992; Brown 2002; Deshler and Schumaker 1993; Guthrie and Wigfield 2000; Palincsar and Brown 1984; Pressley et al. 1998). Good readers are self-regulated learners who skilfully use a repertoire of reading strategies before, during, and after reading a text and who believe they can read well because of their active, strategic reading (Hilden and Pressley 2007).

According to the social-cognitive model of SRL, environmental and personal processes interact cyclically to shape students' learning behaviours (Pintrich and Zusho 2002; Schunk and Ertmer 2000). Environmental factors at the micro-level (e.g. teachers' instructional practices) and macro-level (e.g. cultural context of teaching and learning) have been highlighted in recent SRL research (Butler 2002; Paris and Paris 2001; Pintrich and Zusho 2002; Pintrich and Schrauben 1992; Tang and Neber 2008; Wolters and Pintrich 1998). Summarizing the findings of previous studies, effective instructional practices that promote SRL include direct strategy instruction, open and authentic learning tasks, mastery-oriented assessment, and providing students with sufficient autonomy and scaffolding to develop independent learning (Housand and Reis 2008; Lombaerts et al. 2009; Perry 1998; Perry et al. 2006; Perry and VandeKamp 2000; Perry et al. 2002; Perry et al. 2004, 2007; Pintrich et al. 1994; Schunk and Zimmerman 1997; Turner 1995).

Since the concept of SRL is derived from Western theories and studies, its applicability to other cultures must be examined (Pintrich and Zusho 2002; McInerney 2008). Studies conducted in Chinese contexts have revealed controversial views on the nature and importance of SRL among Chinese learners. First, the description of self-regulated learners and SRL-based instruction seems to contradict traditional views of teaching and learning in Chinese classrooms. Influenced by CHC, instructional practices in traditional Chinese classes are always described as teacher-centred and authoritarian. Chinese students are stereotyped as passive learners who rely on teachers' instruction and rote-based learning at the expense of critical thinking (Gow et al. 1996; Ho 1994, 2009; Ho et al. 2001). The strong academic performance of such Chinese students, who do not seem to be self-regulating, challenges the postulation that self-regulated students are more likely to achieve and suggests that other, more important factors may contribute to their success. On the other hand, SRL has been emphasized in the recent curriculum reform of mainland China (Ministry of Education, People's Republic of China, 2002) and Hong Kong (Curriculum Development Council of Hong Kong [HKCDC], 2001a).[1] The positive impacts of SRL on students' reading development have also been replicated in China (Cheng 2001; Lau 2006; Lau and Chan 2003; Law et al.

[1] Although Hong Kong is a city of the PRC, it maintains its own education system under 'one country, two systems'. Hong Kong's school curriculum and public examinations are separate from mainland China's.

2008; Zhang and Wu 2009). Since few studies have directly compared SRL between Chinese and Western students, it is unclear whether the traditional stereotyped impression of Chinese learners remains valid after the curriculum reform. Moreover, most previous studies only examined the relationship between Chinese students' SRL and reading performance, without considering other factors. It is unclear whether SRL remains crucial to Chinese students' strong performance after controlling for students' background factors.

Reading Assessment in PISA

PISA is an international assessment coordinated by the Organization for Economic Co-operation and Development (OECD). It assesses the extent to which 15-year-old students nearing the completion of their compulsory education have acquired the knowledge and skills essential for meeting the challenges in society. Since 2000, the PISA has been administered every three years. The assessment covers reading, mathematical, and scientific literacy, which are alternated as major domains of the assessment. Reading was the major domain in 2000 and 2009. The OECD (2009) defines reading literacy as 'understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society' (p. 23). This definition emphasizes the interactive nature of reading and the constructive nature of comprehension, and is parallel with changes in society, economy, and culture.

In PISA 2009, with reading as a major assessment domain, the OECD reported an overall composite reading score as well as subscales scores for three different reading processes (accessing and retrieving, integrating and interpreting, and reflecting and evaluating) and two types of reading materials (continuous and non-continuous texts). According to the PISA 2009 assessment framework (OECD 2009), the 'access and retrieve' subscale refers to the process of finding and selecting the required information. The 'integrate and interpret' subscale assesses the ability to form a broad understanding of the text and create meaning from something not stated in the text. The 'reflect and evaluate' subscale requires students to make reflections and evaluations based on knowledge, ideas, or attitudes beyond the text in order to relate the textual information to their own conceptual and experiential frames of reference. The PISA reading stimulus texts are generally classified into continuous and non-continuous texts. Continuous texts are typically composed of sentences organized into paragraphs, while non-continuous texts are mostly organized in matrix format based on combinations of lists (e.g. tables, graphs, diagrams). Subscale reading scores reflect students' reading ability from surface to high-order comprehension for different types of texts and, thus, provide a comprehensive basis for making cross-national comparisons between Chinese students and students in other countries on their reading ability.

Besides the assessment of the three literacy domains, PISA also gathers contextual and personal information from students and school principals to understand factors related to students' performance. Because of the importance of SRL, measures of SRL components have been included in all PISA Student Questionnaires since its first implementation. The present study mainly focuses on PISA 2009 data. In PISA 2009, student questionnaires covered all three main SRL constructs: reading engagement, use of learning strategies, and metacognition. Indices of reading engagement include reading enjoyment, reading diversity, and online reading. Indices of strategy use include memorization, elaboration, and control strategies. The two indices of metacognition are students' awareness of the most effective strategies to understand and remember information and to summarize information. Moreover, three indices of the perceived teaching and classroom climate in reading lessons, including disciplinary climate, teachers' stimulation for students' engagement, and their use of structuring and scaffolding strategies, were selected from the PISA 2009 Student Questionnaire to explore the relationship between Chinese students' SRL and instructional environment.

Hong Kong was the first Chinese region to participate in PISA.[2] Hong Kong students have consistently demonstrated strong performance on all PISA cycles. Recently, more Chinese regions have joined the project. About 475,000 students from 65 countries or regions participated in PISA 2009. Besides Hong Kong, other participating Chinese and East Asian countries/regions included Shanghai, Taipei, Macao, Korea, Singapore, and Japan. The high performance of students from these regions has increasingly attracted researchers' attention. Against this background, we aim to answer the following three questions from the PISA 2009 dataset. First, how are Hong Kong students performing on the overall reading literacy scale and subscales? By comparing Hong Kong students' reading subscale scores with those of other top-ranking countries, we aim to examine whether Chinese students outperformed students from other countries in different levels of reading processes. Second, what are the levels of Hong Kong students' SRL in term of strategy use, metacognition, and reading engagement? Standardized PISA index scores allow cross-national comparisons to examine whether Chinese students are less self-regulated than are students from other countries. Third, are different components of SRL significantly related to Hong Kong students' reading

[2] The first PISA cycle, PISA 2000, only involved OECD countries. Hong Kong joined PISA 2000 + in 2002 with other non-OECD countries and regions. The assessment of PISA 2000 + was the same as PISA 2000.

performance? The relationships between different SRL components and reading performance is examined together with students' gender and family and school background to determine whether SRL continues to play a significant role in Chinese students' reading performance, as proposed in the Western SRL model, when controlling for background variables.

Method

Database and Sample

The present study is an analysis of the 2009 PISA dataset. The data were collected in Hong Kong in April and May 2009. School selection was based on a two-step stratified sampling design. In the first stage, schools were stratified by school type (government, aided, and independent) and student intake ability (high, medium, and low) according to information provided by Hong Kong Education Bureau. Stratified sampling ensured that schools of all backgrounds were appropriately represented in the sample. In the second stage, 35 fifteen-year-old students were randomly selected from each sample school. A total of 4837 students from 151 schools were accepted for final analysis according to the OECD sampling standard. These students were spread across six secondary school grades, but mostly (65.8 %) from secondary four. The sample had approximately the same proportion of boys (52.9 %) and girls (47.1 %).

Variables

Reading performance.[3] The PISA 2009 reading test consisted of 30 stimulus texts. A total of 131 test items with different formats, including multiple-choice, closed-constructed response, open-constructed response, and short-response items, were designed using the PISA assessment framework to capture students' performance in different reading processes and types of texts. All items were reviewed by PISA Governing Board subject expert groups and were piloted in a field trial in all participating countries/regions before a final set of items was selected for the main study (see OECD 2010a, p. 187 for detailed design and item descriptions). Reading performance was represented by reading literacy scores. A combined reading literacy scale, with a mean score of 500 and a standard deviation of 100 was established in PISA 2000.

Measures of SRL. Eight indices were selected from the PISA 2009 Student Questionnaire to explore the three main components of SRL. The learning strategy scale consists of three subscales measuring self-reported use of memorization, elaboration, and control strategies. The metacognition scale consists of two subscales: awareness of the most effective strategies to (1) understand and remember information and (2) summarize information. The reading engagement subscales include reading enjoyment, reading material diversity, and online reading. Among these measures, reading enjoyment, reading diversity, and the three learning strategies also appeared in the PISA 2000 cycle, with minor modifications. Online reading and metacognition were newly introduced to PISA in 2009. For the metacognition subscales, students are asked to evaluate the quality and usefulness of different reading strategies for reaching the intended goal on a 6-point Likert scale. An expert rater scoring system is used to assess the degree to which a student is aware of the best ways of understanding, remembering, and summarizing reading information. Items on reading enjoyment and the three learning strategies are measured on a 4-point Likert scale; items on reading diversity and online reading are measured on a 5-point Likert scale. All questionnaire indices were scaled using a weighted maximum likelihood estimate method and standardized across OECD countries/regions set at 0 and the standard deviations set at 1 (see OECD 2010b, Annex A1 for a detailed description of items and indices).

Measures of teaching and classroom climate. To understand the relationship between classroom context and SRL, three indices of the teaching and classroom climate in reading lessons from PISA 2009 were used: (1) students' perceptions of the disciplinary climate and (2) teachers' stimulation of students' engagement, and (3) use of structuring and scaffolding strategies. All items were measured on a 4-point Likert scale. These indices were scaled in the same way as the SRL indices.

Internal consistency reliabilities and mean scores for all selected indices in the Hong Kong sample are listed in Table 1.

Statistical Analyses

Descriptive analysis was used to examine all key variables from an international and comparative perspective. Then, correlation analysis, regression analysis, and hierarchical linear modelling (HLM) were conducted to investigate the associations between learning strategies, metacognition, reading engagement, learning environment, and literacy performance. Student background and school variables were included in HLM as control variables. Student variables included gender, parents' occupation, and parents' education. School variables included student composition in terms of the school's mean parental economic-socio-cultural status (ESCS) and the percentage of girls in the school.

[3] Electronic reading was added as an optional assessment in PISA 2009, but this paper only focuses on the paper-based assessment of reading.

Table 1 Reliability estimates and index means of Hong Kong students for the PISA 2009 subscales selected in the study

Subscale	No. of items	Cronbach's alpha	Mean index	S.E.
Learning strategy				
Memorization	4	.72	.13	.01
Elaboration	4	.81	.00	.02
Control	5	.77	−.14	.02
Metacognition				
Understanding and remembering	6	.73	−.20	.02
Summarizing	5	.78	−.53	.02
Reading engagement				
Enjoyment of reading	11	.87	.32	.01
Diversity in reading	5	.57	.46	.02
Online reading	7	.77	.38	.02
Teaching and classroom climate				
Disciplinary climate	5	.88	.37	.02
Teacher stimulation for students' reading engagement	7	.83	−.03	.02
Use of structuring and scaffolding strategies	9	.85	−.18	.02

The HLM analysis was divided into three parts: (1) the variation of students' reading performance among schools; (2) the effects of student and school factors on reading performance; (3) the effects of SRL after controlling for student and school contextual factors.

First, a null model was used to partition the variance of reading performance into within- and between-school portions. The model is represented in Eqs. (1) and (2).

$$\text{Read}_{ij} = B_{0j} + R_{ij} \quad (1)$$

$$B_{0\text{j}} = G_{00} + U_{0\text{j}} \quad (2)$$

where Read_{ij} is the reading score of student i in school j. B_{0j} is the unadjusted average reading score of school j, and G_{00} is the reading score grand mean. The variance (R_{ij}) is the within-school variance of reading scores, and the variance (U_{0j}) is the between-school variance.

The second model adds student and school contextual factors. This model, Model 1, examines the effect of these variables on reading performance, represented by Eqs. (3) and (4):

$$\begin{aligned}\text{Read}_{ij} = {} & B_{0j} + B_{1j}(\text{girl}) + B_{2j}(\text{parental occupation status}) \\ & + B_{3j}(\text{mother's education}) + B_{4j}(\text{father's education}) \\ & + B_{5j}(\text{material resources}) \\ & + B_{6j}(\text{home educational resources}) \\ & + B_{7j}(\text{cultural possessions}) + R_{ij} \end{aligned} \quad (3)$$

$$\begin{aligned} B_{0j} = {} & G_{00} + G_{01}(\text{school mean ESCS}) \\ & + G_{02}(\text{percentage of girls in school}) + U_{0j} \end{aligned} \quad (4)$$

Finally, the eight SRL variables and three constructs representing teaching and classroom climate were incorporated into the model. Model 2 is represented by Eqs. (5) and (6):

$$\begin{aligned}\text{Read}_{ij} = {} & B_{0j} + B_{1j}(\text{girl}) + B_{2j}(\text{parental occupation status}) \\ & + B_{3j}(\text{mother's education}) + B_{4j}(\text{father's education}) \\ & + B_{5j}(\text{material resources}) \\ & + B_{6j}(\text{home educational resources}) \\ & + B_{7j}(\text{cultural possessions}) + B_{8j}(\text{memorization}) \\ & + B_{9j}(\text{elaboration}) + B_{10j}(\text{control}) \\ & + B_{11j}(\text{understand and remember}) \\ & + B_{12j}(\text{summarize}) + B_{13\text{j}}(\text{enjoyment}) \\ & + B_{14j}(\text{reading diversity}) + B_{15j}(\text{online reading}) \\ & + B_{16j}(\text{disciplinary climate}) + B_{17j}(\text{stimulation}) \\ & + B_{18j}(\text{structuring and scaffolding}) + R_{ij} \end{aligned} \quad (5)$$

$$\begin{aligned} B_{0j} = {} & G_{00} + G_{01}(\text{school mean ESCS}) \\ & + G_{02}(\text{percentage of girls in school}) + U_{0j} \end{aligned} \quad (6)$$

Results

Hong Kong Students' Reading Performance

The overall performance of Hong Kong students in the PISA 2009 reading assessment was strong. Their mean score on the combined reading literacy scale was 533, which was much higher than the OECD mean of 493. This ranked Hong Kong 4th among the 65 participating countries/regions (Table 2). Statistically, Hong Kong only performed significantly lower than Shanghai did. Comparisons across assessment cycles revealed that while Hong Kong students consistently performed better than the OECD average, they generally performed better in the recent three cycles (2006, 2009, and 2012) than the first two cycles (2000+ and 2003) (Table 3).

Among the reading process subscales, Hong Kong students' best results were in reflecting and evaluating. They also demonstrated a more outstanding performance in reflecting and evaluating among the top ranking countries/regions compared with the other two reading process subscales (Table 2). While Hong Kong students' mean scores on all three reading process subscales in PISA 2009 were higher than those in PISA 2000+, only the difference in integrating and interpreting was statistically significant (Table 4). Hong Kong students performed much better on continuous texts than on non-continuous texts. They also demonstrated a more outstanding performance in reading continuous texts among the top-ranking countries/regions when compared with their performance in reading non-continuous texts (Table 2). Since no text format subscale

Table 2 Mean scores of the combined reading literacy scale and the five subscales of the top-ranking countries and regions in PISA 2009

Country/Region	Rank	Combined reading literacy scale	Reading process			Text format	
			Access & retrieve	Integrate & interpret	Reflect & evaluate	Continuous text	Non- continuous text
Shanghai-China	1	556	549	558	557	564	539
Korea	2	539	542	541	542	538	542
Finland	3	536	532	538	536	535	535
Singapore	5	526	526	525	529	522	539
Canada	6	524	517	522	535	524	527
New Zealand	7	521	521	517	531	518	532
Japan	8	520	530	520	521	520	518
Australia	9	515	513	513	523	513	524
Netherlands	10	508	519	504	510	506	514
Chinese Taipei*	23	495	496	499	493	496	500
Macao-China*	28	487	493	488	481	488	481
Hong Kong -China	4	533	530	530	540	538	522
OECD average	–	493	495	493	494	494	493

* The mean scores of Taipei and Macao are listed for comparisons among the four Chinese regions

Table 3 Comparison of Hong Kong students' overall reading performance across different PISA assessment cycles

	Mean score	S.E.	Difference with PISA 2009
PISA 2012	545	2.8	−12**
PISA 2009	533	2.1	–
PISA 2006	536	2.4	−3
PISA 2003	510	3.7	24**
PISA 2000+	525	2.9	8*

* $p < .05$; ** $p < .01$

Table 4 Comparison of the mean scores of different reading processes among Hong Kong students in PISA 2009 and PISA 2000+

	PISA 2009		PISA 2000 +		Difference
	Mean score	S.E	Mean score	S.E	2009–2000+
Access and retrieve	530	2.7	522	3.2	8
Integrate and interpret	530	2.2	522	2.8	8*
Reflect and evaluate	540	2.5	538	3.2	2

* $p < .05$

scores were provided in PISA 2000+, no comparison could be made between PISA 2009 and PISA 2000+ on this variable.

Hong Kong Students' Self-regulated Learning

The mean indices of all SRL measures among the top-ranking countries/regions are shown in Table 5. Among the three types of learning strategies, Hong Kong students reported above-average use of memorisation strategies, below-average use of control strategies, and approximately average use of elaboration strategies when compared with the OECD average. Although Hong Kong students improved substantially on all learning strategies from PISA 2000+ to 2009 (memorization: .07 to .13; elaboration: −.21 to 0; control: −.28 to −.14), their use of elaboration and control strategies remained unsatisfactory compared with the OECD average. In contrast, their memorization index was the highest among East Asian countries/regions. The control index was below the OECD average for all East Asian countries/regions except Singapore (Table 5). This finding suggests that most East Asian students, including Hong Kong students, are not good at executing control over their learning. Regarding the two metacognition subscales, Hong Kong students scored far below the OECD average and ranked the lowest among all top-ranking and East Asian countries/regions (Table 5), indicating that they not only have relatively low awareness of effective strategies among the PISA participating countries/regions but also lag behind their counterparts in countries/regions with similar CHC backgrounds.

In contrast with the cognitive and metacognitive SRL components, Hong Kong students performed well on all reading engagement subscales. Hong Kong ranked 3rd in reading enjoyment and diversity indices and 1st in online reading among the top-ranking and East Asian countries/regions (Table 5). Their reading enjoyment index increased substantially from .07 in PISA 2000+ to .32 in PISA 2009. Most East Asian countries/regions obtained relatively high reading enjoyment scores compared with top-ranking

Table 5 Index means of SRL-related measures of the top-ranking countries and regions in PISA 2009

Country/Region	Learning strategy			Metacognition		Reading engagement		
	Memorization	Elaboration	Control	Understanding & remembering	Summarizing	Enjoyment of reading	Diversity of reading	Online reading
Shanghai-China	−.07	.16	−.28	.14	.06	.57	.43	−.35
Korea	.08	.08	−.27	.03	.04	.13	.01	−.21
Finland	−.25	−.15	−.34	.03	.00	.05	.45	−.04
Singapore	.06	.24	.30	.05	.17	.29	.53	.13
Canada	−.02	−.21	.10	−.03	.02	.13	−.11	−.04
New Zealand	−.25	−.06	.17	−.04	−.14	.13	.05	−.29
Japan	−.70	−.74	−.55	.12	−.01	.20	.38	−.49
Australia	−.06	−.14	.06	.02	−.09	.00	−.12	−.08
Netherlands	−.25	−.20	−.11	.10	−.14	−.32	−.32	.09
Chinese Taipei*	−.31	.12	−.39	−.13	−.40	.39	.49	−.19
Macao-China*	−.16	−.09	−.53	−.10	−.28	.08	.17	−.02
Hong Kong-China	.13	.00	−.14	−.20	−.53	.32	.46	.38

* The mean indices of Taipei and Macao are listed for comparisons among the four Chinese regions

Western countries, suggesting that most East Asian students, including Hong Kong students, have positive attitudes towards reading.

Hong Kong Students' Perception of the Teaching and Classroom Climate

Hong Kong students perceived a more positive disciplinary climate in their reading lessons, but less teacher stimulation of students' reading engagement and less use of structuring and scaffolding strategies compared with the OECD average (Table 6). This pattern is similar to other East Asian countries/regions. While the disciplinary climate indices of all East Asian countries/regions were higher than the OECD average, most obtained negative indices for teacher stimulation and use of structuring and scaffolding strategies. This suggests that teachers in CHC-influenced regions put more emphasis on maintaining classroom discipline than on supporting the development of engaged, skilful readers.

Table 6 Index means of teaching and classroom climate measures of the top-ranking countries and regions in PISA 2009

Country/Region	Disciplinary climate	Teacher stimulation	Structuring and scaffolding
Shanghai-China	.45	.14	−.12
Korea	.38	−.43	−.63
Finland	−.29	−.33	−.23
Singapore	.12	−.04	.25
Canada	−.08	.23	.43
New Zealand	−.12	.12	.33
Japan	.75	−.13	−.51
Australia	−.07	.13	.22
Netherlands	−.28	−.38	−.23
Chinese Taipei*	.09	−.04	−.05
Macao-China*	.11	−.23	−.50
Hong Kong-China	.37	−.03	−.18

* The mean scores of Taipei and Macao are listed for comparisons among the four Chinese regions

Relationship Between Classroom Climate, SRL, and Reading Performance

Correlations among different SRL components and the perceived classroom climate are shown in Table 7. Regarding the relationship between the cognitive and motivational components of SRL, reading enjoyment had the strongest relationship with students' awareness and use of learning strategies. Among the classroom climate indices, the disciplinary index had the lowest correlations with different components of SRL. Teachers' stimulation and use of structuring and scaffolding strategies were moderately correlated with students' use of different strategies and reading engagement, but weakly correlated with metacognition.

As shown in Fig. 1, enjoyment of reading was the strongest predictor of reading performance in the simple regression analysis. The metacognition indices also showed a substantial impact on reading performance. However, among the learning strategies, only control strategies had a strong positive association with reading performance. The effects of elaboration and memorization strategies on reading performance were relatively small. Compared with the measures of SRL, classroom climate had little impact

Table 7 Correlations among learning strategies, metacognition, reading engagement, and classroom climate among Hong Kong students

	2	3	4	5	6	7	8	9	10	11
1. Use of memorisation strategies	.38**	.54**	.05**	.01	.17**	.12**	.20**	.09**	.21**	.22**
2. Use of elaboration strategies	1	.62**	.05**	.05**	.24**	.17**	.26**	.06**	.28**	.25**
3. Use of control strategies		1	.20**	.20**	.32**	.17**	.25**	.13**	.29**	.30**
4. Understanding and remembering			1	.45**	.19**	.06**	.06**	.10**	.10**	.12**
5. Summarizing				1	.21**	.08**	.03	.08**	.07**	.08**
6. Enjoyment of reading					1	.35**	.09**	.14**	.16**	.16**
7. Diversity of reading materials						1	.27**	.02	.15**	.14**
8. Online reading activities							1	.03*	.21**	.19**
9. Disciplinary climate								1	.19**	.19**
10. Teacher stimulation									1	.65**
11. Structuring and scaffolding										1

* $p < .05$; ** $p < .01$

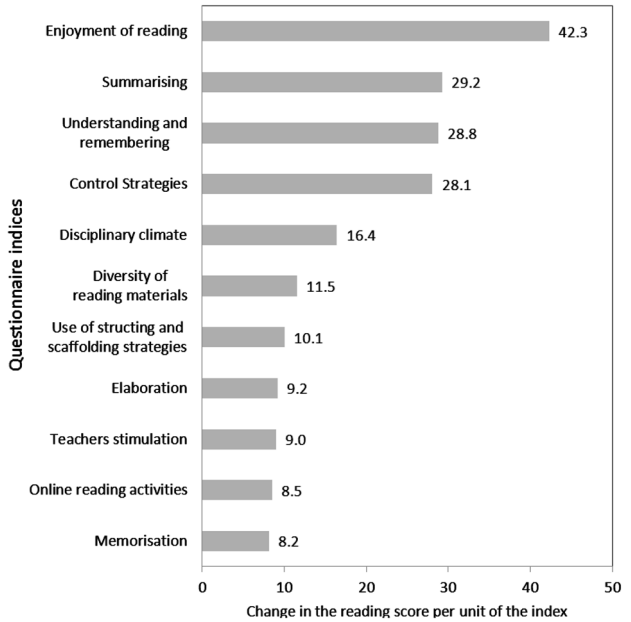

Fig. 1 Effects of learning strategies, metacognition, reading engagement, and classroom climate on Hong Kong students' reading performance

on reading performance, with disciplinary climate having the strongest effect.

HLM was used as the final analysis to investigate the effects of SRL and learning environment on reading literacy, after controlling for student and school variables. Model 1 estimated the effects of background variables on students' reading performance. As shown in Table 8, results indicated that parental education and occupation were not associated significantly with reading performance. While material resources had a negative relationship with reading performance, family educational resources and cultural possession were positive predictors. At the school level, school mean ESCS and percentage of girls were positively associated with reading performance. Consistent with previous cycles, gender was a significant predictor, with girls performing better than boys even after controlling for student and school factors.

Model 2 estimated the effect of different SRL components and classroom climate on reading performance after individual background and school factors were taken into account. Results indicated that all learning strategy and metacognitive indices significantly predicted reading performance. Control strategies had the strongest impact, followed by the two metacognition indices. Surprisingly, the use of memorization and elaboration strategies was negatively associated with reading performance; this may be due to multicollinearity of the five constructs that has induced statistical suppression. The results in correlation analyses (Table 7) lent support to this explanation. Among the reading engagement indices, only reading enjoyment significantly predicted reading performance but with a higher effect than all learning strategy and metacognition indices. Regarding classroom climate, only the disciplinary climate was significantly and positively associated with reading performance.

Discussion

Using the 2009 PISA dataset, we examined Hong Kong students' reading performance and SRL in terms of strategy use, metacognition, and reading engagement, and explored the importance of SRL on explaining their reading performance. Overall, Hong Kong students performed well on the PISA 2009 reading assessment. Among the reading process and text format subscales, they were

Table 8 Multilevel analysis of the effects of learning strategies, metacognition, reading engagement, and classroom climate on Hong Kong students' reading performance

	Model 1		Model 2	
	Coef.	S.E.	Coef.	S.E.
Intercept	534.38***	3.30	534.98***	2.78
School factors				
Mean ESCS[a]	46.72***	6.81	39.44***	6.20
Percentage of girls[b]	42.72***	12.91	36.25***	10.70
Student level factors				
Girl	22.26***	2.09	10.89***	1.90
Parent social background				
Highest parental occupational status	.08	.09	.04	.09
Educational level of mother	−.97	.86	−1.22	.81
Educational level of father	.47	.77	−.07	.68
Family resources				
Wealth	−5.35***	1.33	−2.48*	1.12
Home educational resources	8.77***	1.34	4.97***	1.19
Cultural possessions	2.99*	1.29	−.28	1.13
Learning Strategies				
Memorization			−9.55***	1.18
Elaboration			−6.60***	1.34
Control strategies			16.07***	1.39
Metacognition				
Understanding and remembering			7.09***	1.01
Summarizing			11.59***	.82
Reading engagement				
Enjoyment of reading			19.29***	1.36
Reading diversity			1.64	1.12
Online reading			2.05	1.24
Classroom climate				
Disciplinary climate			4.78***	1.21
Teacher stimulation			−1.02	1.33
Structuring & scaffolding			−.68	1.30

[a] *ESCS* economic-socio-cultural status

[b] Refers to the percentage of 15-year-old girls in the school who are eligible for the PISA study

* $p < .05$; ** $p < .01$; *** $p < .001$

relatively good at reflecting/evaluating and reading continuous texts. Compared with the OECD average, Hong Kong students showed better reading engagement and perceived a more positive classroom disciplinary climate in their reading lessons, but they used fewer control strategies, had a poorer awareness of effective reading strategies, and perceived less teacher stimulation and support. Reading enjoyment, the use of control strategies and metacognition were the SRL components that most strongly supported Hong Kong students' reading performance.

In recent years, the strong performance of East Asian countries/regions has aroused international attention. It is noteworthy that among the three reading process subscales, Hong Kong students' highest score was in reflecting and evaluating. They also performed better on continuous texts, which usually involve in-depth comprehension. This pattern was similar to Shanghai, but different from other top-ranking countries, such as Korea, Finland, and Singapore, which obtained comparable scores across different reading subscales. When compared with the results of PISA 2000+, Hong Kong students significantly improved in integrating and interpreting. The strong performance of Hong Kong students in higher level reading skills was consistent with the findings of Li et al. (2013). Also using the PISA 2009 dataset, they found that when controlling for overall reading ability, Shanghai students were more proficient in integrating and interpreting and in reading continuous texts than were U.S. students, but that there was no significant difference in their proficiency in accessing and retrieving. This study and that of Li et al. refute the stereotype that Chinese learners are only good at rote memorization and simple retrieving tasks.

From a cultural perspective, some researchers argue that in CHC-influenced regions, rote memorization is not merely mindless recitation. In Confucian cultures, memorization and understanding are not viewed as separate, but rather as interlocking processes which lead to high-quality learning outcomes (Chan and Rao 2009; Kember and Gow 1991; Morrison 2006; Watkins and Biggs 2001). In Chinese classes, students are always encouraged to develop a deep understanding of a text through repeatedly reading it aloud and reciting it. This deep learning approach is consistent with the CHC emphasis on effort and hard work (Jeynes 2008; Morrison 2006; Zhang and Kong 2012). It helps Chinese students establish a solid learning foundation and develops rather than that harms their higher-order thinking ability. This postulation is supported by the strong and positive relation between Hong Kong students' use of memorization and control strategies. The memorization strategies index also had a small and positive effect on Hong Kong students' reading performance.

Besides cultural factors, OECD (2011) has linked Hong Kong's and Shanghai's superior PISA 2009 performance to curriculum reform in Hong Kong and mainland China. Since 2009 was Shanghai's first PISA assessment cycle, no pre-reform comparison could be made. In Hong Kong, however, performance has been stronger in the three latest assessment cycles (PISA 2006, 2009 and 2012) than in the first two cycles (PISA 2000+ and 2003), which coincides with the curriculum reform that began in 2002 (HKCDC 2001a). Reading instruction in the new Chinese language curriculum has been changed from the traditional 'text-based' approach to a 'competence-based' approach

(HKCDC 2001b). Unlike the old curriculum, which focused on memorization and basic reading skills, the current curriculum emphasizes different levels of reading ability. Similar to the PISA assessment framework, most reading items in Hong Kong public examinations involve integrating and interpreting; students are also required to express their personal opinions on the content or format of a text. Hong Kong students' substantial improvement in PISA 2009 might exemplify the success of the new curriculum in enhancing students' reading literacy.

The results for different SRL and classroom climate measures suggest that teaching and learning in Hong Kong are still deeply influenced by the traditional Confucian heritage. The overall positive findings on reading engagement in Hong Kong, Shanghai-China, and Taipei are consistent with previous findings that Chinese students generally have stronger achievement motivation and attitudes towards learning than their Western counterparts (Rogers 1998; Salili 1996; Stevenson 1993). Multilevel analyses indicated that reading enjoyment was the strongest SRL predictor of reading performance after controlling for background variables. This is consistent with numerous studies (e.g. Guthrie and Wigfield 2000; Logan et al. 2011; McGeown et al. 2012; Retelsdorf et al. 2011; Wigfield 1997), suggesting that motivation is an essential factor for reading development. Besides cultural influence, instructional environment also plays an important role in shaping adolescents' reading motivation (Pintrich et al. 2003). However, the findings of PISA 2009 indicated that the degree of teachers' stimulation of students' engagement in Hong Kong reading class was low. The principles suggested by Guthrie and Wigfield's engagement model, such as using real-world interactions to connect reading to student experiences, affording students an abundance of interesting books and materials, supporting student choice and self-determination, facilitating strategy use in reading tasks, and encouraging collaboration among students, provide useful directions for teachers to restructure the classroom environment to develop students' reading motivation and competence simultaneously (Guthrie and Alao 1997; Guthrie and Davis 2003; Guthrie and Wigfield 2000).

Compared with their strong reading performance and motivation, Hong Kong students' use of learning strategies and metacognition was unsatisfactory. The weak results of most East Asian countries/regions on these variables are consistent with the stereotyped impression that students in CHC societies rely on memorization and seldom use self-regulatory strategies to increase learning efficiency (D. Ho et al. 2001; Littlewood 1999; Watkins et al. 1991). This student characteristic may be closely related to the learning environment of Chinese classes. In traditional Chinese reading classes, the focus is usually on knowledge transmission; students are expected to develop their reading ability indirectly through intensive recitation of prescribed texts (Ho 1999; Tse et al. 1995). Although the importance of teaching–reading strategies to develop students' independent reading ability is emphasized in the current Chinese language curriculum guide (HKCDC 2001b), the findings of PISA 2009 suggest that students' knowledge and use of strategies remain unsatisfactory after curriculum reform. The strong disciplinary climate and low teacher stimulation and scaffolding revealed in PISA 2009 is consistent with previous studies on reading instruction in Hong Kong (Lau 2012, 2013), suggesting that Chinese teachers continue to assume great authority and provide limited opportunities for student autonomy, which may impede the development of self-regulated learners.

At first glance, the strong performance and poor use of strategies and metacognition among Hong Kong students seems to contradict the SRL theory that good learners should be self-regulated (Perry et al. 2004; Pintrich and Zusho 2002). Multilevel analyses, however, indicated that control strategies and metacognition were significant predictors of Hong Kong students' reading performance. These findings are consistent with previous studies on Chinese students (Cheng 2001; Lau 2006; Lau and Chan 2003; Law et al. 2008; Zhang and Wu 2009), suggesting that the awareness and effective use of self-regulatory strategies are essential to Chinese students' reading development. In contrast, although Hong Kong students' use of memorization strategies was also a positive predictor of their reading comprehension in regression analysis, its positive effect became negative when the effects of control strategies and metacognition were included in multilevel analyses. It suggests that though memorization is a positive strategy for Chinese learners, it is not as effective as SRL strategies. One possible explanation for the paradox of Chinese learners suggested by Morrison (2006) is that their hard work compensates for their lack of effective learning strategies. The findings of PISA 2009 support this postulation. Hong Kong students reported a higher amount of time spent in regular reading lessons at school (274.3 min per week) than the OECD average (217.2 min per week), and a higher proportion of Hong Kong students (30.4 %) attending after-school lessons than the OECD average (22.1 %). Then the next question is as follows: Can we help Chinese students achieve high performance in a more effective way? Many previous studies have indicated that students need opportunities to receive direct strategy instruction, engage in open activities, and have the autonomy to make free choices in order to become self-regulated learners (Housand and Reis 2008; Lombaerts et al. 2009; Perry 1998; Perry and VandeKamp 2000; Perry et al. 2002, 2004, 2006, 2007; Pintrich et al. 1994; Turner 1995). The significant relationship in PISA 2009 between teachers'

stimulation and use of scaffolding strategies and all SRL measures is consistent with these previous studies. Instructional practices identified in these studies should provide useful direction for Chinese teachers to establish a more favourable learning environment that helps students learn more strategically and efficiently.

Conclusion

Based on PISA 2009, this study refutes the stereotypical notion of Chinese students as rote learners who are only good at low-level tasks. Influenced by the traditional deep learning approach and the recent curriculum reform, Hong Kong students performed better in higher level reading processes than students in many participating countries did. While the findings generally support the positive relationship between SRL and reading performance, motivation was found to be the most important SRL component in explaining the strong performance of Hong Kong students. The traditional CHC still influences teaching and learning in modern Hong Kong. Although changes in the Chinese language curriculum have enhanced Hong Kong students' reading performance in recent PISA cycles, the instructional approach in Chinese classes remains teacher-centred. With a lack of knowledge and opportunities to practise learning strategies, students may rely on memorization and hard work. Discussing the cross-cultural applicability of SRL theory, McInerney (2008) postulated that SRL should be related to positive learning outcomes regardless of cultural background, but that certain cultural and educational settings may make it more difficult to develop some self-regulatory processes. PISA 2009 results have important implications for Hong Kong educators seeking to alter their traditional instructional approach to enhance students' awareness of and ability to use a variety of appropriate strategies to optimize their learning processes and outcomes.

While PISA provided valuable data for understanding the strengths and weaknesses of Hong Kong students' reading performance and exploring SRL from a cross-national perspective, several limitations and suggestions for future research should be noted. First, as a cross-sectional study, the results are only correlational. Morrison (2006) noted the problem of causality when using Chinese learners' characteristics to explain their achievement on international tests. He also pointed out that simple linear relationships between independent and dependent variables may not be appropriate for explaining the dynamic, interactive relationships between learning and performance. Therefore, follow-up studies using longitudinal and mixed-methods designs are needed to delineate the complicated relationship between the characteristics of Chinese learners and their high achievement in international assessments. Second, although the significant relationship between SRL and reading performance was confirmed in the multilevel analysis, SRL measures explained relatively little variance in reading performance. Besides SRL, many plausible factors may contribute to the superior achievement of Chinese students, such as parental expectations, the examination system, and private tutoring. Empirical evidence is needed to verify the impact of these variables. Finally, the study mainly focused on the analysis of Hong Kong students. The findings may not be applicable to all Chinese students, given substantial variation across regional boundaries and socioeconomic and educational backgrounds (Chan and Rao 2009; Morrison 2006). As increasingly more Chinese regions join PISA, future studies should continue to use PISA data to explore the convergent and divergent characteristics that affect the reading performance of Chinese students in different regions.

References

Borkowski, J. G. (1992). Metacognitive theory: A framework for teaching literacy, writing, and Math skills. *Journal of Learning Disabilities, 25*(4), 253–257.

Brown, R. (2002). Straddling two worlds: Self-directed comprehension instruction for middle schoolers. In C. C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 337–350). New York: Guilford Press.

Butler, D. L. (2002). Qualitative approaches to investigating self-regulated learning: Contributions and challenges. *Educational Psychologist, 37*, 59–63.

Chan, K. K., & Rao, N. (2009). The paradoxes revisited: The Chinese learner in changing educational contexts. In K. K. Chan & N. Rao (Eds.), *Revisiting the Chinese learner: Changing contexts, changing education* (pp. 315–350). Hong Kong: Springer: Comparative Education Research Centre, The University of Hong Kong.

Cheng, B. L. (2001). The relations among motivation, goal setting, action control, and learning strategies: The construct and verification of self-regulated learning process model (in Chinese). *Journal of Taiwan Normal University: Education, 46*, 67–92.

Deshler, D. D., & Schumaker, J. B. (1993). Strategy mastery by at-risk students: Not a simple matter. *The Elementary School Journal, 94*, 153–167.

Dignath, C., & Buttner, G. (2008). Components of fostering self-regulated learning among students: A meta-analysis on intervention studies at primary and secondary school level. *Metacognition Learning, 3*, 231–264.

Efklides, A. (2011). Interactions of metacognition with motivation and affect in self-regulated learning: The MASRL model. *Educational Psychologist, 46*, 6–25.

Gow, L., Balla, J., Dember, D., & Hau, K. T. (1996). The learning approaches of Chinese people: A function of socialization processes and the context of learning? In M. H. Bond (Ed.), *The handbook of Chinese Psychology* (pp. 109–123). Hong Kong: Oxford University Press.

Guthrie, J. T., & Alao, S. (1997). Designing contexts to increase motivations for reading. *Educational Psychologist, 32*, 95–105.

Guthrie, J. T., & Davis, M. H. (2003). Motivating struggling readers in middle school through an engagement model of classroom practice. *Reading and Writing Quarterly, 19*, 59–85.

Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P. B. Mobenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 403–420). New York: Longman.

Hilden, K. R., & Pressley, M. (2007). Self-regulated through transactional strategies instruction. *Reading and Writing Quarterly, 23*, 51–75.

Ho, D. Y. (1994). Cognitive socialization in Confucian heritage cultures. In P. Greenfield & R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 285–314). Hillsdale, NJ: Erlbaum Associates.

Ho, M. S. (1999). *Evaluating the Chinese language curriculum from an ability training perspective (in Chinese)*. Hong Kong: Culture and Education Publishing Co.

Ho, E. S. C. (2009). Characteristics of East Asian learners: What we learned from PISA. *Educational Research Journal, 24*(2), 327–348.

Ho, D. Y., Peng, S. Q., & Chan, F. S. (2001). An investigative research in teaching and learning in Chinese society. In C. Y. Chiu, F. Salili, & Y. Y. Hong (Eds.), *Multiple competencies and self-regulated learning: Implications for multicultural education* (2nd ed., pp. 215–244). Greenwich, CT: Information Age.

Hojo, M., & Oshio, T. (2012). What factors determine student performance in East Asia? New evidence from the 2007 Trends in International Mathematics and Science Study. *Asian Economic Journal, 26*, 333–357.

Hong Kong Curriculum Development Council (HKCDC). (2001a). *Learning to learn—The way forward in curriculum*. Hong Kong: Government Printer.

Hong Kong Curriculum Development Council (HKCDC). (2001b). *Chinese language education curriculum guide (junior and senior secondary grades) (in Chinese)*. Hong Kong: Government Printer.

Horner, S. L., & Shwery, C. S. (2002). Becoming an engaged, self-regulated reader. *Theory Into Practice, 41*, 102–109.

Housand, A., & Reis, S. M. (2008). Self-regulated learning in reading: Gifted pedagogy and instructional settings. *Journal of Advanced Academics, 20*, 108–136.

Jeynes, W. (2008). What we should and should not learn from the Japanese and other East Asian education system. *Educational Policy, 22*, 900–927.

Kember, D., & Gow, L. (1991). A challenge to the anecdotal stereotype of the Asian student. *Studies in Higher Education, 16*, 117–128.

Lau, K. L. (2006). Reading strategy use between Chinese good and poor readers: A think-aloud study. *Journal of Research in Reading, 29*, 367–382.

Lau, K. L. (2012). Instructional practices and self-regulated learning in Chinese language classes. *Educational Psychology, 32,* 427–450.

Lau, K. L. (2013). Chinese language teachers' perception and implementation of self-regulated learning-based instruction. *Teaching and Teacher Education, 31,* 56–66.

Lau, K. L., & Chan, D. W. (2003). Reading strategy use and motivation among Chinese good readers and poor readers in Hong Kong. *Journal of Research in Reading, 26*, 177–190.

Law, Y. K., Chan, C. K., & Sachs, J. (2008). Beliefs about learning, self-regulated strategies and text comprehension among Chinese children. *British Journal of Educational Psychology, 78*, 51–73.

Lee, J. (2014). Universal factors of students achievement in high-performing Eastern and Western countries. *Journal of Educational Psychology, 106*, 364–374.

Leung, F. K. S. (2002). Behind the high achievement of East Asian students. *Educational Research and Evaluation, 8*, 87–108.

Li, H., Lei, P. W., & Pace, C. L. (2013). Reading subskill differences between students in Shanghai-China and the US: Evidence from PISA 2009. *Educational Research and Evaluation, 19*, 490–509.

Littlewood, W. (1999). Defining and developing autonomy in East Asian contexts. *Applied Linguistics, 20*, 71–94.

Logan, S., Medford, E., & Hughes, N. (2011). The importance of intrinsic motivation for high and low ability readers' reading comprehension performance. *Learning and Individual Differences, 21*, 124–128.

Lombaerts, K., Engels, N., & van Braak, J. (2009). Determinants to teachers' recognitions of self-regulated learning practices in elementary education. *The Journal of Educational Research, 102*, 163–173.

McGeown, S. P., Norgate, R., & Warhurst, A. (2012). Exploring intrinsic and extrinsic reading motivation among very good and very poor readers. *Educational Research, 54*, 309–322.

McInerney, D. M. (2008). The motivational roles of cultural differences and cultural identity in self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications* (pp. 369–400). New York: Lawrence Erlbaum Associates.

Morrison, K. (2006). Paradox lost: Toward a robust test of the Chinese learner. *Education Journal, 34*(1), 1–30.

OECD (2009). *PISA 2009 Assessment Framework: Key competencies in reading, mathematics and science*. Retrieved from http://www.oecd.org/pisa/pisaproducts/44455820.pdf.

OECD (2010a). *PISA 2009 results: Vol. 1. What students know and can do: Student performance in reading, mathematics and science.* Retrieved from http://www.oecd.org/pisa/pisaproducts/48852548.pdf.

OECD (2010b). *PISA 2009 results: Vol. 3. Learning to learn: Student engagement, strategies and practices.* Retrieved from http://www.oecd.org/pisa/pisaproducts/48852630.pdf.

OECD (2011). Shanghai and Hong Kong: Two distinct examples of education reform in China. In OECD (Ed.), *Lessons from PISA for the United States* (pp. 83–109). Paris: OECD.

Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 1*, 117–175.

Paris, S. G., & Paris, A. H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist, 36*, 89–101.

Perry, N. E. (1998). Young children's self-regulated learning and contexts that support it. *Journal of Educational Psychology, 90*, 715–729.

Perry, N. E., Hutchinson, L., & Thauberger, C. (2007). Mentoring student teachers to design and implement literacy tasks that support self-regulated reading and writing. *Reading and Writing Quarterly, 23*, 27–50.

Perry, N. E., Phillips, L., & Dowler, J. (2004). Examining features of tasks and their potential to promote self-regulated learning. *Teachers College Record, 106*, 1854–1878.

Perry, N. E., Phillips, L., & Hutchinson, L. (2006). Mentoring student teachers to support self-regulated learning. *The Elementary School Journal, 106*, 237–254.

Perry, N. E., & VandeKamp, K. O. (2000). Creating classroom contexts that support young children's development of self-regulated learning. *International Journal of Educational Research, 33*, 821–843.

Perry, N. E., VandeKamp, K. O., Mercer, L. K., & Nordby, C. J. (2002). Investigating teacher-student interactions that foster self-regulated learning. *Educational Psychologist, 31*, 5–15.

Pintrich, P. R. (2000). The role of goal-orientation in SRL. In M. Boekaerts, P. R. Pintrich, & M. Zeider (Eds.), *Handbook of self-regulation* (pp. 451–502). San Diego, CA: Academic Press.

Pintrich, P. R., Conley, A. M., & Kempler, T. M. (2003). Current issues in achievement goal theory and research. *International Journal of Educational Research, 39*, 319–337.

Pintrich, P. R., Roeser, R. W., & DeGroot, E. A. (1994). Classroom and individual differences in early adolescents' motivation and self-regulated learning. *Journal of Early Adolescence, 14*, 139–161.

Pintrich, P. R., & Schrauben, B. (1992). Students' motivational beliefs and their cognitive engagement in classroom academic tasks. In D. H. Schunk & J. I. Meece (Eds.), *Student perception in the classroom* (pp. 149–183). Hillsdale, NJ: Erlbaum.

Pintrich, P. R., & Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 249–284). San Diego: Academic Press.

Pressley, M., El-Dinary, P. B., Wharton-McDonald, R., & Brown, R. (1998). Transactional instruction of comprehension strategies in the elementary grades. In D. M. Schunk & R. J. Zimmerman (Eds.), *Self-regulated learning: From teaching to self-reflective practice* (pp. 42–55). New York: The Guilford Press.

Retelsdorf, J., Koller, O., & Moller, J. (2011). On the effects of motivation on reading performance growth in secondary school. *Learning and Instruction, 21*, 550–559.

Rogers, C. (1998). Motivational indicators in the United Kingdom and the People's Republic of China. *Educational Psychology, 18*(3), 275–292.

Salili, F. (1996). Achievement motivation: A cross-cultural comparison of British and Chinese students. *Educational Psychology, 16*(3), 271–280.

Schunk, D. H., & Ertmer, P. A. (2000). Self-Regulation and academic learning: Self-efficacy enhancing interventions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631–650). San Diego, CA: Academic Press.

Schunk, D. H., & Zimmerman, B. J. (1997). Developing self-efficacious readers and writers: The role of social and self-regulatory processes. In J. T. Guthrie & A. Wigfield (Eds.), *Reading engagement: Motivating readers through integrated instruction* (pp. 34–50). Newark, DE: International Reading Association.

Stevenson, H. W. (1993). Why Asian students still outdistance Americans. *Educational Leadership, 50*(5), 63–66.

Tang, M., & Neber, H. (2008). Motivation and self-regulated science learning in high-achieving students: Differences related to nation, gender, and grade-level. *High Ability Studies, 19*, 103–116.

Tse, S. K., Chan, W. S., Ho, W. K., Law, N., Lee, T., Shek, C., & Yu, F. Y. (1995). *Chinese language education for the 21st century: A Hong Kong perspective*. Hong Kong: The University of Hong Kong.

Turner, J. C. (1995). The influence of classroom contexts on young children's motivation for literacy. *Reading Research Quarterly, 30*, 410–441.

Watkins, D., & Biggs, J. B. (2001). The paradox of Chinese learner and beyond. In D. A. Watkins & J. B. Biggs (Eds.), *Teaching the Chinese learner: Psychological and pedagogical perspectives* (pp. 3–26). Hong Kong: Comparative Education Research Centre, The University of Hong Kong.

Watkins, D., Reghi, M., & Astilla, E. (1991). The-Asian-learner-as-a-rote-learner stereotype: Myth or reality? *Educational Psychology, 11*, 21–34.

Wigfield, A. (1997). Reading motivation: A domain-specific approach to motivation. *Educational Psychologist, 32*, 59–68.

Winnie, P. H., & Perry, N. E. (2000). Measuring self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 531–566). San Diego: Academic Press.

Wolters, C. A., & Pintrich, P. R. (1998). Contextual differences in student motivation and self-regulated learning in mathematics, English, and social studies classrooms. *Instructional Science, 26*, 27–47.

Zhang, M., & Kong, L. (2012). An exploration of reasons for Shanghai's success in the OECD Programme for International Student Assessment (PISA) 2009. *Frontiers of Education in China, 7*, 124–162.

Zhang, L. J., & Wu, A. (2009). Chinese senior high school EFL students' metacognitive awareness and use of reading strategies. *Reading in a Foreign Language, 21*(1), 37–59.

Zimmerman, B. J. (2001). Theories of self-regulated learning and academic achievement: An overview and analysis. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (pp. 1–38). Mahwah, NJ: Lawrence Erlbaum Associates.

Zimmerman, B. J., & Martinex-Pons, M. (1988). Construct validation of a strategy model of student self-regulated learning. *Journal of Educational Psychology, 80*, 284–290.