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On the road to participatory pedagogy: A mixed-methods study of pedagogical interaction in Chinese kindergartens

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HIGHLIGHTS

- Teacher-initiated dialogues and open-ended questions dominated pedagogical interactions in Chinese kindergarten classrooms.
- Children were guided to clarify or elaborate on teachers' ideas.
- Related child, teacher and cultural factors jointly influenced the pedagogical interaction.
- The gap between the form and function of pedagogical interactions was found.

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ABSTRACT

This study investigated the pedagogical interactions between teachers and young children in six sampled Chinese kindergarten classrooms. Altogether 4320 turns of dialogue were coded from 27 videotaped pedagogical activities, and the 12 class teachers were surveyed and interviewed. The results revealed a unique Chinese pedagogical interaction that is a fusion of participatory and transmissive pedagogies: teachers directed the interactions with open-ended questions and whole-class dialogues, whereas children responded with short answers based on the learning content. This was reported by the teachers to be associated with the joint influence of related child, teacher, and cultural factors.

Traditional Chinese pedagogy has been well known for being teacher-directed and achievement-oriented and is commonly labeled as transmissive pedagogy or instructivism (Li, Rao, & Tse, 2012; Rao, Ng, & Pearson, 2010; Zhu & Wang, 2005). To change this tradition, the educational authorities of China have promoted constructivism and participatory pedagogy in early childhood education (ECE) through issuing the *Guidelines for Kindergarten Education (trial version)* (Ministry of Education of China, 2001) since the turn of this millennium. This top-down reform, however, has encountered resistance from Chinese teachers who were neither trained nor ready for this paradigm shift (Zhu & Zhang, 2008). Whether and how Chinese teachers have delivered constructivism-oriented, participatory pedagogy in their classroom as expected, are still unknown. This study thus investigated the authentic pedagogical interactions between Chinese teachers and their young children to understand how teachers practiced participatory pedagogy after the pedagogical reform.

1. Early childhood pedagogies in China: instructivism versus constructivism

Instructivism regards learning as simply mapping the real, external world onto the minds or behaviors of the child and dependent on other's instruction (Jonassen, 1991); thus, features highly-structured, teacher-directed, academic-oriented, and didactic learning (Porcaro, 2011). Constructivism, however, regards knowledge as a personal interpretation, individually and actively constructed on the basis of interaction with the environment rather

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than transferred from expert to learner (von Glasersfeld, 1996). According to Piaget (1954), the founder of cognitive constructivism, accommodation and assimilation functions in the ongoing learning process where learners use and modify their existing cognitive schemes to assimilate new knowledge and accommodate to new conditions. According to Vygotsky (1978), the founder of social constructivism, children play an active role when they engage in the social, interpersonal interaction in the learning process. As generated from the learning theory of constructivism, participatory pedagogy refers to the teaching approach to stimulate children's thinking through heuristic questions and hands-on problem-solving (Rasku-Puttonena, Lerkkanena, Poikkeusa, & Siekkinenb, 2012). Similarly, those progressive ideas such as child-centeredness, developmentally appropriate practice (DAP), and experiential learning have also originated from the learning theory of constructivism.

ECE in modern China has gone through two conflict phases between traditional instructivism and progressive constructivism (Qi & Melhuish, 2017; Zhu & Zhang, 2008). The first conflict phase happened in the early 1950s when the model of Soviet Union's educational system was forcefully implemented in China. This "Soviet Union" model being instructivist in nature is congruent with the Chinese traditional culture which required teachers to instruct children in unified and purposeful activities through structured schedules, unified content, and subject-based learning (Zhu & Wang, 2005). As the only official guide in early childhood teacher education in China, the *Teaching Plan for the Colleges of Kindergarten Education* (1956) has successfully established the dominance of instructivism and unified the mode of kindergarten teacher education to be "*Three Disciplines and Six Pedagogical Subjects*" (三学六法): "Three Disciplines" refer to the disciplines of education, psychology and hygiene; and "Six Pedagogical Subjects" are the subject-based pedagogies of general knowledge, numeracy, music, fine arts, language, and physical education. Preservice kindergarten teachers mainly received three years of professional training through teachers' schools or normal colleges/universities (Hu & Szente, 2009). They were trained to systematically teach children different subjects through teacher-directed pedagogies and planned activities (Zhu & Wang, 2005). This instructivism-oriented system has been well established in China and passed down from generation to generation. Accordingly, Chinese kindergarten teachers were accustomed to delivering whole-class, teacher-directed, subject-based, and even academic-focused instruction (Wang & Mao, 1996).

The second conflict phase began in the 1980s when China "opened the door" and started to introduce, import, and transplant new notions, models, and approaches of ECE from the developed countries such as the United States (Zhu & Zhang, 2008). Some new curricula have been imported and become popular. Meanwhile, the integrated theme-based curriculum has been developed to integrate various subjects around a topic or unit to make learning more relevant and connected (Lonning, DeFranco, & Weinland, 1998; Qi & Melhuish, 2017). At the turn of this millennium, a radical reform in early childhood curriculum and pedagogy was launched with the *Guidelines* being formally enacted in 2001. The *Guidelines* has abandoned instructivism and its "Three Disciplines and Six Pedagogical Subjects" system, and instead promoted a localized version of participatory pedagogy. It aims to introduce the notion of DAP and replace the traditional pedagogy with constructivism-oriented one, which underlines child-centeredness, children's individual needs, active and integrated learning, and play (Liu & Feng, 2005; Zhu & Zhang, 2008). However, teacher education programs were not changed to train teachers with the needed knowledge and skills (Yang & Li, 2018a). Moreover, a growing number of teachers' schools which are the major providers of teacher education have been established due to the educational authorities' decision to enhance teacher professionalism (Jiang, Pan, & Sun, 2017). These teachers' schools tended to follow the traditional training system, and those kindergarten teachers were trained with the instructivism-oriented program thus unable to conduct constructivism-oriented, participatory pedagogies (Jiang, Pang, & Sun, 2017). Accordingly, a remarkable policy-practice gap was observed: in beliefs, the kindergarten teachers tended to accept the child-centered approach and participatory pedagogy; in practices, they tended to employ the pedagogies with some instructivism-oriented features such as the teacher-directed instruction, whole-class teaching, and highly structured interactions (Li et al., 2012; Hu, Chen, & Fan, 2018).

2. Pedagogical interaction in early childhood settings

Pedagogical interaction is closely related to an important term – teacher-child interaction, a dynamic combination of behavioral and verbal engagement between teachers and children embedded within a responsive environment (Downer, Sabol, & Hamre, 2010). It consists of three major domains: emotional support, classroom organization, and instructional support (Pianta, LaParo, & Hamre, 2008). Hu, Fan, LoCasale-Crouch, Chen, and Yang (2016) examined teacher-child interactions in Chinese kindergartens using the Classroom Assessment Scoring System (CLASS, Pianta et al., 2008). Compared to the other two sub-scales, Chinese kindergarten teachers had the lowest scores in the aspect of instructional support that was demonstrated to be predictive of children's development of language, social, and pre-academic skills (Burchinal et al., 2008). Therefore, this research focuses on "pedagogical interaction", which is applied here to refer to an interactive process of teaching and learning between teachers and children (Downer et al., 2010).

Verbal communication and physical behaviors, which can strongly predict the teacher-child relationship and interpersonal deeds, have been perceived as the two main aspects of pedagogical interaction. Based on these two dimensions, researchers shared various foci to analyze pedagogical interaction such as the behaviors, dialogues and grouping strategies (Li et al., 2012; Connor et al., 2011). For example, Connor et al. (2011) identified three types of pedagogical interaction from the perspective of grouping strategies: whole class, small group, and individual interactions. Specifically, the whole-class approach is conducted when teachers require children's responses to confirm the appropriateness of their teaching progress and children' acquisition, especially in literacy instruction. Small-group and individual instructions based on children's current learning levels and needs are more flexible and personalized than the whole-class teaching (Connor, Morrison, & Slominski, 2006); therefore, they make it possible for teachers to quickly adjust their teaching strategies. Dickinson and Tabors (2002) analyzed the interaction from the perspective of teachers' talk during the book reading and found it mainly deal with classroom management, and naming activities with simple responses and unchallenging questions. Also, *narratives* filled with monologue and *dialogues* emphasizing questioning and children's active participation were the two interactive styles, and the latter was demonstrated to be more effective in promoting children's understanding (Albanese & Antoniotti, 1997). Teachers' use of questions that can stimulate children's reasoning and understanding could result in children's better learning outcomes in mathematics and literacy (Rojas-Drummond & Mercer, 2004).

Also, Li et al. (2012) have distinguished western pedagogy and the traditional Chinese approach in their research and found that different early childhood pedagogies were actually resulted from different cultures. The western pedagogy tends to emphasize

children's individualized, child-centered, and play-based learning, whereas the traditional Chinese pedagogy features adherence, submission, discipline, and academic learning (Li et al., 2012). This finding aligns with the sociocultural theory that emphasizes the social nature of individual development and human interaction (Rogoff, 2003; Vygotsky, 1978; Wells, 1999). Along with the organic growth, the cultural growth of behavior and thinking is another line of individual development (Vygotsky, 1978). In the process, individuals will not only learn from human interactions but also construct the collective understanding primarily through language (Mercer & Howe, 2012).

3. The factors influencing pedagogical interaction

Pedagogical interaction can also be regarded as a semiotic mediated activity when teachers and children interact with each other (Santamaría & de la Mata, 2012; Chiang & Mi, 2011). In the sociocultural version of interactions, semiotics are crucial instruments of teaching and learning, and their meaning is not inherent in the written words but oral language (Santamaría & de la Mata, 2012). Also, existing studies have generally related the pedagogical interaction to personal (e.g., teacher and child characteristics) and contextual factors (e.g., preschool classroom and culture) (e.g., Martin, Drasgow, & Halle, 2015; Matsumura, Garnier, Slater, & Boston, 2008; Wallace & Sung, 2017). Therefore, this study employs the sociocultural theory that emphasizes the influences of the cultural and historical contexts on individual functions (Rogoff, 2003; Vygotsky, 1978) to analyze the factors influencing pedagogical interaction. In particular, the three lenses would be focused on when analyzing the dynamics of pedagogical interaction: individuals, interrelated relations, and the sociocultural contexts.

First, the influential factors at individual level. Teachers' professionalism has been confirmed to affect the pedagogical interaction. Teachers' professionalism refers to their mastery of teaching and how they cope with conditions related to teaching (Hu et al., 2018; Kunter et al., 2013), which includes teachers' knowledge of children, educational beliefs and more. Teachers' knowledge of children reflects their views on children and the way to support children's development (Hu et al., 2018). Existing studies attribute this kind of knowledge to two sources, namely, pre-service education and in-serve training (Pianta et al., 2005). It was demonstrated that specialized training and specific knowledge about ECE were much more important than holding a bachelor's degree (Ball, 2000; Hu et al., 2018). This kind of knowledge could facilitate teachers' provision of learning support, such as concise instruction, clear demonstration, lucid explanation, and constructive feedback (Kunter et al., 2013). In addition, educational beliefs reflect teacher's teaching philosophy and would shape their classroom practices, such as teaching planning, strategies, and classroom organization (Ball, 2000; Blay & Ireson, 2009). Holding child-centered beliefs, teachers tend to enhance children' cognitive thinking and socio-emotional development through involving them in a democratic climate with equal communication and respectful feedback to motivate children's learning desire and to bridge children' learning gaps (Downer et al., 2010). In contrast, teachers with teacher-centered beliefs prefer to conduct direct teaching and ignore active interactions with a high control of lesson structure and learning paces (Hu et al., 2018).

Meanwhile, children's temperament may also affect the pedagogical interaction. Temperament refers to child's depositions to behave or react in a certain way (Downer et al., 2010). Keogh (2003) found that favorably temperamental children tended to initiate more positive dialogues with teachers. This aligns with another empirical finding that aggressive and disruptive children who disordered class management tended to elicit more interactions (mostly negative) from teachers (Coplan & Prakash, 2003; Rudasill, 2011). Meanwhile, shy and quiet children were often neglected in the classroom and were less likely to have pedagogical interactions with teachers (Coplan & Prakash, 2003; Rudasill, 2011).

Second, the influential factors at the classroom level. Preschool classroom as the context also affects the pedagogical practices, as it is the most direct setting where teachers' teaching, children's learning, and teacher-child interactions coexist. The existing studies have primarily focused on the location (urban vs. rural), teacher-child ratio (high vs. low) and activities (large group vs. free choice) (Pianta et al., 2005; Rao, Sun, Zhou, & Zhang, 2012). And the current consensus is that lower teacher-child ratio would contribute to higher quality of pedagogical interactions (Pianta et al., 2005). A lower teacher-child ratio would lessen the pressure of classroom management and enable teachers to be more sensitive to understand children's individual needs and to enhance the quality of instruction. It was also found that teachers were more likely to use rare and novel words when they conducted large-group formal lessons. Free-choice activities, including free play and activities in learning areas, would require relatively less teacher-directed input but more individual interactions with children (Cabell, Decoster, Locasale- Crouch, Hamre, & Pianta, 2013; Chien et al., 2010).

Third, the relationship between cultural context and pedagogical interaction. It was revealed that different cultures would predict different patterns of pedagogical interaction, whereas teachers and children who shared the similar cultural background tended to have more similar pedagogical interactions (Geiger & Alant, 2005). This is because different cultural contexts would breed different patterns of pedagogical interaction. In a hierarchical cultural context, for instance, teachers tended to dominate interaction and reject children's questioning, whereas a democratic culture would encourage equal and active dialogue between teachers and children (Hignam, Tönsing & Alant, 2010). This phenomenon could be explained by the cultural community theory, as proposed by Rogoff (2003). A cultural community refers to a population who jointly possess the same views, opinions, beliefs, behavioral patterns, and ethnic identity (Rogoff, 2003). Similar interaction forms could be generated when children and adults are involved in the same cultural community.

Research to date has extensively analyzed pedagogical interaction in early childhood settings, especially in the United States. However, there is little empirical evidence about young children's pedagogical participation and their teachers' pedagogical practice in Chinese classrooms. Therefore, this study aims to fill the knowledge gap by systematically investigating the features and related factors of pedagogical interaction between Chinese kindergarten teachers and their children. Accordingly, we conducted this mixed-methods study on early childhood pedagogical interaction in a Chinese city to address the following questions:

1. How were teachers and children engaged in pedagogical interaction in Chinese kindergartens? Were there any patterns and features?
2. What factors did Chinese kindergarten teachers perceive to have influences on their pedagogical interaction with children?

4. Methodology

This study employed a mixed-methods design to investigate the features and related factors of pedagogical interaction in Chinese kindergartens. The dataset is obtained from a larger research project entitled “Teaching Chinese Literacy in Hong Kong, Shenzhen and Singapore: Pedagogical Differences Between

Kindergartens and Primary Schools" (See more details in Li et al., 2012).

4.1. Participants

Shenzhen, a special economic zone which has pioneered in ECE reforms since the "opening-up reform" launched in China in the late 1970s, was selected as the social setting for this study. To ensure the representativeness of samples, we used the stratified random sampling approach to recruiting three kindergartens from three districts which respectively represented low-, middle-, and upper-middle socioeconomic level of enrolled children's family backgrounds. After selecting the kindergartens with informed consents from the principals, random sampling was used to select the participating classes. One K2 (serving children aged 4–5 years old) and one K3 (serving children aged 5–6 years old) classes were selected from each kindergarten. K1 (serving children aged 3–4 years old) class was excluded as it focused on children's daily-life activities rather than instructional activities. Altogether, six classes (*N* of classes = 6) were selected for this research. Two teachers who mainly conducted instruction in each participating class were invited to participate in this research. Informed consents were obtained from all of these 12 teachers (*N* of teachers = 12). All the demographic information of these teachers was shown in Table 1.

4.2. Data collection

Classroom observations. Videotaped, non-participant observations could provide rich, authentic information, thus have been widely applied in investigating teacher-child interactions in early childhood settings (Pianta & Hamre, 2009). Hence, in this research, teachers' instructional activities were videotaped for a full week (i.e., five typical school days) in the six selected classrooms during the first semester, with a focus on teacher-child pedagogical interactions. To make the children and teachers be familiar with the presence of camera and observer, a familiarization period was provided prior to the formal videotaped observation. Each classroom was videotaped for a maximum of 3 h in each observational day, resulting in approximately 15 h and 4–5 videotaped sessions of instructional activities for each class (27 videotaped sessions in total). Each session lasted from 25 min to 37 min with an average time of 28 min and 42 s.

Questionnaires. The modified version of *The Classroom Literacy Environment Index* (CLEI) (Li, 2000) which had been proved to be reliable and valid in assessing Chinese literacy instruction, was used to analyze teachers' beliefs and teaching practice. The participating teachers completed this questionnaire that included three parts and 38 items in total. The first part aimed to obtain their teaching practice and focused on literacy activities, reading resources, and reading strategies. The second part aimed to obtain teachers' beliefs and thoughts. The items included the main reason for teaching children how to read and write, the importance of motivation, attention, fun and time on task, and parents' and teachers' expectation for children's leaning. The five-point Likert scale was used to rate each item. Sociodemographic data were collected from teachers in the third part, such as the years of teaching, educational certification, involvement in in-service training, and the age group they were teaching.

Interviews. Every class teacher was invited to participate in an individual, semi-structured interview after the videotaped observation of instructional activities. The interviews tried to elicit teachers' reflections on their pedagogical interactions. The interview protocol was developed to understand teachers' beliefs and their classroom practices (Li et al., 2012). It consisted of two parts and 13 questions. The first part introduced the questionnaire survey results to teachers and asked whether these results could truly reflect their own pedagogical interactions (e.g., *Do these quantitative analyses truly reflect your activities? Why or why not?*). The second part explored the influencing factors (e.g., *Why do you conduct the interaction in this way?*). Each interview was audiotaped and lasted around 45 minutes.

Table 1
Demographic characteristics of participating teachers.

	Teachers (N = 12)
Gender	
Female	12 (100%)
Male	0 (0)
Age	
<20 years	0 (0)
<30 years	10 (83%)
<40 years	2 (17%)
Class	
K2	6 (50%)
K3	6 (50%)
Education	
Secondary degree	8 (67%)
Associate degree	4 (33%)
Bachelor degree	0 (0)
Working Experience	
<20 years	1 (1%)
<15 years	2 (2%)
<10 years	5 (42%)
<5 years	4 (33%)

4.3. Data analysis

Both quantitative and qualitative data analyses were employed to investigate the profile and perceived influencing factors of pedagogical interactions. In particular, the observational data were quantitatively analyzed to draw the patterns of pedagogical interaction in Chinese kindergartens, and Chi-square analyses were conducted to examine whether the differences were significant, such as the interactive pattern and the characteristics of dialogue. All the dialogues in the observed activities were transcribed for systematic coding. *The Cam-UNAM Scheme for Educational Dialogue Analysis (SEDA)* (Hennessy et al., 2016) was used to code teacher-child dialogues. This scheme consists of eight clusters which can provide a comprehensive framework to analyze the function of each dialogue. Besides, another coding scheme adapted from both *Chinese Classroom Observational Scheme* (Liu, Kotov, Rahim, & Goh, 2005) and Hunkins' (1976) five levels of teacher's questioning was used to analyze the interactive patterns including the interactive forms (e.g., whole-class, small-group, and individual types) and teachers' questioning forms. A pilot coding of three videotaped activities was conducted before the formal coding of using SEDA. Two coders were trained to comprehend the definitions of each code and practice coding. The Kappa coefficient of inter-coder reliability was 0.827 for the cluster of inviting elaboration or reasoning, 0.853 for the cluster of making reasoning explicit, 0.702 for the cluster of building on ideas, 0.743 for the cluster of positioning and coordination of ideas, 0.794 for the cluster of connecting, 0.812 for the cluster of guiding the direction of dialogue or activity, 0.805 for the cluster of reflecting on dialogue or activity, and 0.807 for expressing or inviting ideas. The overall inter-coder reliability was 0.813. All the transcripts were coded according to the coding scheme. SPSS 20 was then used for the statistical analysis. Also, the observational data were qualitatively described to show a nuanced picture of pedagogical interactions.

The recorded interviews were transcribed in Chinese. NVivo 11 (Melbourne: QSR International) was used to analyze the interview

transcripts with the following coding framework: (1) open coding which aimed to identify some frequent units occurred in the interview (e.g., children's learning activities), (2) axial coding which aimed to group the units into meaningful themes (e.g., children's characteristics, children's behaviors, and teachers' training), and (3) selective coding which aimed to identify the high-order categories (e.g., children's characteristics, teachers' professional development, the demands of academic preparation, and the sociocultural expectation of teacher's role) (Corbin & Strauss, 2014). To address the research questions, we analyzed all the interview transcripts through the following steps: first, we read through all transcripts and labeled vital information related to research purpose; second, we identified themes and organized them into coherent categories; and third, we identified connections within various categories and interpreted the findings. The trustworthiness of the qualitative data analysis was ensured through two different techniques (Yin, 2014): (1) *peer debriefing* which was conducted by the first author and a doctoral student in educational research, and (2) *inquiry auditing* in which the first author was supervised under a senior researcher in early childhood education who helped to check through the process of data analysis.

5. Findings

5.1. Characteristics of the pedagogical interaction

This study revealed a common pattern of pedagogical interaction. Teacher-initiated, whole-class, and dialogue-focused interactions were mostly conducted in the participating Chinese kindergartens. Regarding the forms of the dialogue, open-ended questioning was the prevailing way to initiate interaction. Regarding the functions of the dialogue, inviting ideas and elaboration and guiding the direction of dialogue or activity were the most frequent for the teachers, whereas clarifying and elaborating on their or others' opinions/answers was commonly used by the children.

Interactive forms. To identify the forms of pedagogical interaction in the Chinese kindergarten classrooms, we analyzed the occurrence of pedagogical interaction in the dimensions of the interactive subject, social organization, and instructional strategy (See Table 2). According to the observational data, around 1840 times of interaction and 4320 turns[1] occurred in 27 activities, approximately 68 times per activity and twice per minute. Chi-square analyses showed a significant difference in the frequency of three groups of interactive forms. As shown in Table 2, most of the interactions were initiated by the teachers (94.62%), whereas the children initiated only approximately 5.38% ($\chi^2 = 1465.307$; $p < 0.01$). In terms of the social organization in the pedagogical interaction, whole-class (65.12%) and individual (33.05%) interactions were the most frequent, whereas small-group interactions (1.83%) were rarely seen ($\chi^2 = 1112.583$; $p < 0.01$). In addition, the teachers mostly conducted dialogue-focused instruction (76.12%) and less frequently conducted direct instruction (19.91%) and demonstration (3.97%) ($\chi^2 = 1692.808$; $p < 0.01$). The evidence indicated that most of the interactions were initiated by the teachers' questioning in whole-class activities. The forms of teachers' questioning were further analyzed to describe the pedagogical interaction.

Characteristics of teachers' questioning. As shown in Table 3, the high occurrence of teachers' questioning demonstrated that the teachers tended to engage children by asking questions continuously. To investigate the characteristics of their questions, we analyzed the frequency of teachers' questioning which was open-ended/close-ended and known/unknown (the answer to the question is known/unknown). More specifically, the open-ended question requires diverse responses, while the close-ended question usually seeks for the dichotomous answer (e.g., “yes” or “no”). The known question refers to the type of question that teacher already knows the answer, whereas the unknown question is related to the fact that teacher may not know the answer when he/she asks the question.

Next, Chi-square analysis was conducted on the occurrence of different types of questions, and the results indicated a significant difference ($\chi^2 = 1002.379$; $p < 0.01$). In particular, most questions were open-ended (78.56%) whereas fewer questions were close-ended (21.45%). Moreover, nearly three-quarters of the open-ended questions had known answers (74.30%). Combining these two categories, open-ended and known questions (58.32%) were the most frequent, as compared with open-ended and unknown (20.19%), close-ended and known (27.6%), and close-ended and unknown (3.18%) questions.

Characteristics of teacher-child dialogue. According to SEDA (Hennessy et al., 2016), educational dialogues can be divided into eight clusters (See Table 4). Among the turns initiated by teachers, most of them were about *inviting ideas* (36.90%), *inviting the elaboration or reasoning* (24.05%), and *guiding the direction of dialogue or activity* (21.43%). Relatively fewer turns were about *positioning and coordinating* (3.94%), *making reasoning explicit* (1.78%), *building on ideas* (8.58%), and *connecting* (1.95%). Most notably, *reflecting on the dialogue or activity* (0.83%) rarely occurred. These findings indicated that teachers focused more on inviting ideas and guiding the direction of the dialogue, but ignored the importance of reflecting and connecting the learning contents. Teachers seemed to struggle in meeting the educational objectives by keeping inviting ideas and guiding the instructional direction without evaluating and connecting children's previous and new experience.

In terms of children's turns, *building on ideas* was the most frequent (81.81%), which indicated that children were more likely to clarify and elaborate on their or others' opinions/answers. There were 6.81% of turns on *positioning and coordinating*, 5.14% on

Table 2
The occurrence of teacher-child interaction.

Interactive Forms	M	SD	Frequency	Percentage (%)	χ^2
Interactive subject					1465.307**
Teacher-initiated	64.48	34.09	1741	94.62	
Children-initiated	3.67	3.85	99	5.38	
Social organization					1112.583**
Whole class	44.67	25.12	1206	65.12	
Small group	1.26	3.17	34	1.83	
Individual	22.67	13.51	612	33.05	
Instructional strategy					1692.808**
Direct instruction	14.48	9.78	391	19.91	
Dialogue	55.37	31.51	1495	76.12	
Demonstration	2.89	4.22	78	3.97	

Notes. N (teacher) = 12; N (student) = 199; ** $p < 0.01$.

Table 3
The occurrence of teachers' questioning.

Types of Teacher's Question	M	SD	Frequency	Percentage (%)	χ^2
Open-ended with known answer	32.67	23.36	882	58.37	1002.379**
Open-ended with unknown answer	10.63	8.45	305	20.19	
Close-ended with known answer	10.30	8.92	276	18.27	
Close-ended with unknown answer	1.67	1.96	48	3.18	

Notes. N (teacher) = 12; N (student) = 199; ** $p < 0.01$.

Table 4
The occurrence of teacher-child dialogues for the eight clusters.

Cluster	M	SD	Frequency	Percentage (%)
I-Inviting the elaboration or reasoning				
Teacher	21.48	13.79	580	24.05
Children	1.11	4.52	30	1.57
P-Positioning and coordinating				
Teacher	3.52	2.50	95	3.94
Children	4.26	4.00	130	6.81
RD-Reflect on the dialogue or activity				
Teacher	1.85	1.69	50	0.83
Children	0.67	2.62	18	0.94
E-Express or invite ideas				
Teacher	32.96	22.54	890	36.90
Children	1.93	7.17	52	2.72
R-Making reasoning explicit				
Teacher	0.96	1.60	26	1.78
Children	3.63	4.95	98	5.14
B-Build on ideas				
Teacher	7.67	9.81	207	8.58
Children	57.81	33.83	1561	81.81
C- Connecting				
Teacher	1.74	1.53	47	1.95
Children	0.19	0.61	5	0.26
G- Guiding the direction of dialogue or activity				
Teacher	19.15	8.25	517	21.43
Children	0.52	1.91	14	0.73

making reasoning explicit, and 2.72% on *expressing or inviting ideas*. It is notable that children rarely *guided the direction of dialogue or activity* (0.73). Their engagement in the pedagogical interaction was limited to the clarification and elaboration of their opinions and positions such as stating agreement or disagreement.

Patterns of pedagogical interaction throughout the instruction. Qualitative analysis of the observational data indicated that the theme- or unit-based approach and dialogue-focused instruction were commonly used to transmit the information in whole-class activities. The pedagogical interaction in whole-class activities could be divided into three parts: (1) *Introduction* which aimed to introduce some basic concept and stimulate children's interest in the theme or unit; (2) *Main Body* which targeted at transmitting the key concepts and new knowledge and skills; (3) *Review or Summary* which aimed to recall the key concepts and evaluate children's learning. Combining the features of these three parts, we revealed a common pattern of interaction — questioning, response and synthesis.

During the Introduction, teachers would demonstrate something new (e.g., pictures, books, or hand puppets) or something related to children's daily experience with the aim to attract children's attention. Later on, teachers would typically ask some questions to engage children. A common pattern of E-B-I-P emerged in the dynamic process. Teachers would firstly *invite opinions* (E), and children would *clarify their own contribution* (B), then teachers would *invite building on or (dis)agreement of others' contribution* (I), and finally, teachers would *synthesize ideas* (P). The Introduction was often initiated by teachers with open-ended questions and children were invited to give the joint or individual responses. As shown in the following example, the teacher (T1) demonstrated some pictures of animals and initiated the interaction by asking questions.

Case 1. (a K2 class): The teacher (T1) was sitting beside a whiteboard which was pasted with some pictures of animals. The children were sitting around the teacher.

T1: Look at these animals, who can fly in this picture?
All: Eagle.
T1: Raise your hand and tell me.
C1: Eagle. Dragonfly. Butterfly.
T1: Anyone has different ideas from him?
C2: Frog. He can use the airscrew.
T1: He said that the frog could fly with the airscrew. But can frog fly by itself?
All: No.
T1: Frog cannot fly. We agree that eagle, dragonfly, and butterfly can fly.
Why can they fly?
All: They have wings.
T1: Very good. They have wings, so they can fly. Let's look at these wings.

The objective of this activity was to teach children to distinguish and describe the wings of different animals. In the Introduction part, the teacher introduced the basic concept of "wing" by questioning to engage all children in the process. The questions were open-ended, and the answers could be found in the pictures. Therefore, the pedagogical interaction in the Introduction mainly functioned in drawing children's attention, engaging children, and eliciting the direct responses related to key concepts.

In the Main Body of the instruction, three patterns of pedagogical interaction were revealed: (1) identifying the information; (2) analyzing the information; and (3) reasoning. The pattern of *identifying the information* mostly occurred in the pedagogical interaction. The function of teachers' questions was to discover and describe the information. There existed a common pattern of E-B-G. The teacher would firstly *invite ideas* (E), then children would *clarify own contribution* (B), and the teacher would finally *focus* (G) in the information identification. When teachers asked children to identify something, they would firstly attract children's attention such as pointing at it with fingers and giving detailed guidance. They would then ask *what*-questions to encourage children's discussion. The following excerpt could demonstrate this finding.

Case 2. (a K2 class): The teacher (T2) was demonstrating the garland made by a child named Tiantian.

T2: Let's see what has been used in making this GARLAND?
All: Garland.
T2: What is the round one?
All: Garland.
T2: No, what is the ferrous round one?
C1: Hanger! Hanger!
T2: What kind of things wrap the hanger?
C2: Tin grass.
T2: Yes, you are right. Anything else?
C3: The snowman.
T2: We have already figured out the materials. Now, I will invite Tiantian to teach us how to make a garland.

As shown in Case 2, the teacher wanted children to identify the raw materials for making the garland. Accordingly, an open-ended and known question was initiated to draw children's attention to the materials. When children gave the wrong response, the teacher would give a more detailed instruction as the hint to promote the discussion. In the process, after the teacher's questioning, whole-class responses and individual responses appeared alternately.

The pattern of *analyzing the information* was more challenging and less common than identifying the information because it would require children to connect their previous experience and knowledge to analyze the new situation or problems. This pattern of pedagogical interaction appeared more in K3 classes. In terms of analyzing the information, the pattern of E-B-I emerged in the process. Teachers would *invite opinions* (E), children would *clarify their own contribution* (B), and teachers would *ask for an explanation*

(I). Teachers would demonstrate or set a situation and then ask the children to predict and explain with the given information and their previous knowledge or experience. Open-ended and known questions and diverse responses appeared in this pattern. Although the discussion was open and dynamic, there was only one correct answer. The following excerpt is a good example.

Case 3. (a K3 class): The teacher (T3) and children were sitting in the classroom with the lights turning off, and the curtains closed. They were learning the function of light to understand how a shadow is formed.

T3: What is this? [T3 was holding the table lamp.]
All: Table lamp.
T3: Let's see this lamp. Do you know when we should use the lamp?
C1: When it's dark.
C2: When we study.
C3: When we write.
T3: When it's dark, when we study, and when we write, we can use the lamp.
OK, you know, the lamp is adjustable. If I turn down the lamp. [T3 is demonstrating with the lamp.]
When you are writing behind it, can the light reach you?
All: No.
T3: Why not? Some children have not raised their hand yet. I will ask Li [C4].
C4: Because it is too low.
T3: Too low. Would you please add to his answer?
C5: There is a little bit of light.
T3: The lamp is too low, so there is little light.
C6: The light reaches elsewhere.
T3: Now, I will raise the lamp. Can you see the light?
All: Not high enough.
All: We can see! [The teacher raised the lamp to a certain height.]

As shown in Case 3, the teacher asked the children to analyze why the light could not reach them when she turned down the lamp. In the process, a close-ended question and the situation were first provided to identify the consensus that the light could not reach them. Then the teacher put forward an open-ended and unknown question to promote the analysis. However, the teacher only raised one opened-ended question and demonstrated the situation by herself instead of initiating children's exploration by themselves.

The pattern of *reasoning* appeared less in the instruction as compared with information identification and analysis. It mostly occurred in language activity which required children to predict what would happen next and what the story was about by linking to the information already identified. In this process, children need to synthesize the given information and then infer the following information. The pattern of E-B-I-R can be applied to understand this reasoning process. Teachers would *invite ideas* (E), children would *clarify their own contribution* (B), teachers would *invite possibility thinking or prediction and ask for explanation* (I), and children would *make reasoning explicit* (R). Teachers would firstly ask children to identify the information, usually through what-questions, and then invite children's reasoning and explanation with open-ended and unknown questions. Children were encouraged to express their own ideas and contribute to the discussion with their diverse answers. Here comes with a good example.

Case 4. (a K2 class): The teacher (T4) and the children were reading a picture book in a big group.

T4: What can you see in this picture?
All: Birthday.
T4: Oh, there are two words in the picture.
All: Birthday balloon.
T4: Birthday balloon. According to this picture, you can guess what it is about.
All: About the kangaroo birthday.
T4: The kangaroo birthday. Why do you think like that?
C1: Because there are kangaroo and balloon.
T4: Oh. Because there are kangaroo and balloon. I will invite another child.
C2: This kangaroo likes this balloon.
T4: He said that this kangaroo likes this balloon. Any other ideas?
C3: The kangaroo robs this balloon.
T4: Well, let's see what the story is about.

As shown in Case 4, the teacher asked the children to infer the context of the story from the given information. In the process, the known information was identified (i.e., the balloon, kangaroo, and birthday) with open-ended and known questions. When the teacher invited the children to do reasoning, an open-ended and unknown question was used to promote the discussion. Only in the reasoning, questions with unknown answer appeared, and the children could express their own ideas rather than search for the only answer that already existed in the teacher's mind.

Review or Summary which involved teachers' evaluating, synthesizing ideas, and linking learning to wider contexts usually appeared in the last few minutes of the activity. It was usually directed by the teacher who raised a question to promote children's reflection on the learning process or context after the instruction of the Main Body. After collecting children's opinions, teachers would synthesize their ideas and give the future learning direction. The pattern of E-B-P-C emerged in the *Review or Summary* part. Teachers would *invite ideas* (E) first. Children would then *clarify their own contribution* (B). Teachers would *synthesize ideas* (P) and *make learning trajectory explicit* (C). For example,

Case 5. (a K2 class): The teacher (T5) and the children were reading a picture book about animals.

T5: You found that! The lion's hair has become different petals! It looks like a beautiful flower. Now, all the shows have been completed. Which one is the best?
C1: It is the big tree.
T5: Why do you think that?
C2: All the animals made the big tree.
T5: I also like this big tree. Why? Because I think it is not only beautiful but also made by all the animals in the forest. They work together to make this big tree. So, I think it is the best. Do you think so?
All: Yes!
T5: I will put this book in the reading area; you can read it during the learning-center activity. Now, all the children stand up and go to the washroom, please.

As shown in Case 5, the teacher wanted to transmit the positive values of solidarity and cooperation as a summary of the activity. She initiated a discussion among the children to choose the best "show" and concluded the discussion that the one which was performed with collaboration should be the best. The transmission of values which features collectivism would occur at the end of the pedagogical interaction. It was prevalent that teachers' questions in the Review or Summary were open-ended but still had only one correct answer.

5.2. Perceived factors influencing pedagogical interaction

Children's characteristics. The teachers reported in the interviews that children's individual characteristics would influence their pedagogical interaction. More attention would be paid to the children who are introverted, lacking learning interests and weak in expression to engage them in the interaction. This finding was demonstrated by a teacher's statement as follows.

> *I feel that children have individual differences. Some are outgoing and lusty while some are shy and introverted. These introverted children may have difficulty in learning, not because of their competence but of their character, confidence or other reasons. They are unwilling to express, so I would pay more attention to interacting with them.* (Ms. Liu[2])

The introverted children tended to be less responsive in the pedagogical interaction. Therefore, teachers were more likely to conduct individual interaction with them to ensure their learning progress. As reported by Ms. Liu, she tried to pay more attention to and interact more with those children to improve their engagement.

Teachers' professional development. Most teachers mentioned the professional development program which they had participated in, such as instructional viewing and emulating (教学观摩), collective lesson preparation (集体备课), and specialist seminars. These activities would allow teachers to learn from others, reflect on their instruction, and receive feedback from colleagues to promote their pedagogical interaction. However, most teachers stated that they knew the benefits of these professional development activities, but had difficulty in applying what they had learned to practices due to the lack of practical guidelines and support. This concern was made explicit by a teacher, as follows.

> *Sometimes, I would go out for [professional] learning. For example, pedagogies. You may learn other better pedagogical methods. You want to practice in your class. However, I think I have difficulties in applying them. Because you have so many things to do, much odds and ends in kindergarten. You have to care for children's eating, using toilet, and sleeping. As for the instruction, once you want to add something that you have learned, you need to spend a lot of efforts, resources and time on designing and preparing teaching materials …* (Ms. Du)

Participating in professional development activities allowed teachers to learn from peers and specialists and facilitate their reflection on their pedagogical practice. However, the gap between reflection and practice still existed and would weaken the effectiveness of professional development. Low-quality professional development may further constrain the improvement of teachers' pedagogical interaction.

The demands of academic preparation. According to the interviews, there was a contradiction underlying the school transition from kindergarten to primary school in China. In primary schools, the instruction would become whole-class, teacher-directed, academic-oriented, and discipline-based. This fact required kindergarten teachers to better prepare children for future academic learning. As stated by a teacher, Ms. Wei, “school readiness” made her to decide what and how to teach.

> *We have to consider children's school readiness when we design the curriculum and conduct instruction in class. Our kindergarten doesn't have this kind of teaching materials to prepare children for primary school. So, when we conduct instruction, we have to consider about this objective and adopt teaching models that are close to primary schools, such as extending the instruction duration, emphasizing whole-class teaching and sitting posture, and [giving] more assignments.* (Ms. Wei)

For most Chinese kindergartens, children's school readiness was an important predictor of educational quality. To achieve a smooth transition from kindergarten to primary school, in the instructional process, Chinese kindergarten teachers tended to pay more attention to children's interest in literacy and their ability in expressing themselves and obeying school rules.

The sociocultural expectation of teacher's role. This study revealed that the differences between traditional Chinese pedagogy and progressive western pedagogy might have shaped the pedagogical interaction in Chinese kindergartens. A rather high expectation of teacher's role still existed according to the teacher interviews. In other words, they were expected to be the moral model and the authority of knowledge. Therefore, although more dialogues and open-ended questions were found in the instruction, the answers were already known or hidden in the learning content, and the feedback was not informative enough to promote further discussion. These features reflected that the whole instructional process was in nature controlled by teachers. Teachers believed that they should guide children to learn on the right way.

> *The times have changed. Today, we have to ask more open-ended questions. Children can give us their different answers. But we cannot just give them a simple response, such as right or wrong. We have to tell them why it is the right answer. However, for children who cannot understand what I have said, I have to teach them and give them neutral feedback to promote their thinking.* (Ms. Ye)

Teachers seemed to believe that they should teach children something. Most of them perceived learning interests as facilitators that could be nurtured by showing pictures, toys, or something new to promote the teaching process instead of being inside the nature of children.

6. Discussion

This study revealed a unique Chinese pedagogical interaction that is a fusion of the participatory and transmissive pedagogies. In particular, the pedagogical interaction had a constructivism-oriented form such as using high-frequent dialogues and open-ended questions, and an instructivism-oriented function to transfer knowledge from teachers to children. In this section, we will discuss the significant features of pedagogical interaction in the Chinese kindergarten classrooms and the associated factors.

6.1. Chinese pedagogical interaction: looks like participatory but works like transmissive pedagogy

Our findings indicated that teacher-initiated dialogues and open-ended questions with known answer dominated the instruction. Most dialogues occurring in the pedagogical interaction were restricted to the function that teachers invite children's clarification of teachers' ideas to identify the guided information. This is consistent with the findings of some previous studies which indicated that whole-class, teacher-directed teaching predominated the instruction in Chinese kindergarten classrooms (Hu et al., 2016, 2018). According to our observations and interviews, each instructional activity could be well structured and divided into three parts: (1) *Introduction* which aimed to introduce some basic concepts and stimulate children's interests in the theme or unit; (2) *Main Body* which targeted at transmitting the key concept, new

knowledge and skills; and (3) *Review or Summary* which aimed to recall the new concept and evaluate children's learning. Correspondingly, the dialogic patterns including teachers' inviting ideas and children's clarification of their opinions predominated the instruction. The dialogic form of interaction was similar to participatory pedagogy. However, the function of the dialogue was transmissive, which only focused on the curriculum content and motivating children to identify the information in the learning materials such as a picture book.

The gap between the form and function of pedagogical interactions might be caused by the teachers' superficial understanding and practical difficulties of applying constructivist educational theories. As promoted by the aforementioned *Guidelines* (2001), the participatory pedagogy rejects teachers' knowledge transmission and children's passive role in the classroom, and instead advocates that children should actively learn through their own knowledge construction (Tan, 2017). However, in China, most kindergarten teachers were trained with instructivism-based pedagogies and curricula in normal colleges or universities (Jiang et al., 2017; Wang & Mao, 1996). For example, they were asked to teach or conduct activities in a domain-based approach (e.g., language, math, science, physical fitness, etc.) instead of an integrated one. Teacher's "mindset" was trained to conduct instructivism-oriented pedagogies and thus unfamiliar with those constructivist ones.

Therefore, even if effective learning is claimed to be child-directed, play-based and inquiry-based, and to embrace the equal status between teachers and children (Ministry of Education of China, 2001), the participating teachers indirectly guided the direction of the instruction and expressed their ideas through children's mouth. This study showed a hybrid of both transmissive and participatory pedagogies and also indicated the policy-practice gap (Li et al., 2012). This finding aligns with the sociocultural perspective, which puts pedagogical interaction into local and global contexts where teachers and children are culturally shaped by different social norms (John-Steiner & Mahn, 2003).

6.2. Potential influences on the pedagogical interaction

The teachers in this research reported that children's interests and abilities influenced pedagogical interaction. This finding partially aligns with the existing perspective that shy and behaviorally withdrawn children have received more attention from teachers to promote their social behaviors and release their anxiety (Coplan & Prakash, 2003). However, since academic achievement and conformable behaviors were valued in traditional Chinese culture (Lin, Li, & Yang, 2018; Rao et al., 2010), teachers' interactions were more frequent to ensure children's learning progress and draw their attention.

Teachers' professional development was also mentioned to shape pedagogical interaction. It can be explained by the top-down model of educational reform in the Chinese context. The educational reform leaders were mainly scholars and policy-makers; they regarded the reform as an idea revolution to promote children's active participation (Liu & Feng, 2005). However, the pre- and in-service trainings which have a long history of instructivism-oriented pedagogy may have hindered the application of these constructivist views.

According to the interviews, the participating teachers considered the issue of children's smooth transition from kindergarten to primary school to be important. Therefore, they would promote whole-class, teacher-directed instruction to prepare their children for the future academic-focused system and meet parents' expectations (Yang & Li, 2018b). The teacher-directed instructional method was regarded as an essential approach to improving children's academic achievement, since the long-term motor memory of Chinese characters requires rote learning, exercising, and repeating (Tan, 2017). This kind of method is a culturally appropriate practice derived from traditional Chinese pedagogies, but might not be a DAP if considering the characteristics of children's interests and needs (Lee & Tseng, 2008). In addition to the preparation for primary school, Chinese parents might also hold high expectations for children's academic achievement and emphasize the desirable behavior (Lin et al., 2018). This traditional belief also increased the teachers' pressure in promoting children's academic preparation.

After introducing the participatory pedagogy by the government, children's individual development and the children-centered instruction was somewhat valued by teachers. As revealed in this study, teachers tended to less control the process of pedagogical interaction with more dialogues to encourage children's participation. However, the teachers had to meet high expectations, such as being the authority of knowledge. The social expectation of the role of teachers has been derived from the Confucian tradition, the long history of transmissive pedagogy and the exam-oriented educational system. For example, the Confucian tradition features "master-disciple relationship" between teacher and learner (Tan, 2017, p. 242). Specifically, a good learner should work hard and show conformity to perfect the knowledge delivered by the master. These traditional views still influenced teachers' self-expectation and social expectations of teaching even after the educational reform.

7. Conclusion

This study investigated the pedagogical interactions between Chinese teachers and their young children in Shenzhen kindergarten classrooms. The triangulation of data sources has been established, and the results have revealed a unique Chinese pedagogical interaction that is a fusion of participatory and transmissive pedagogies. And the Chinese teachers interviewed in this study attributed this unique pedagogical interaction to the joint influence of related child, teacher, and cultural factors. This finding implies that the instructivist approach has persisted in Chinese kindergarten classrooms to align with the sociocultural features. And the inconsistency between top-down requirements and local needs has led to the compromise between instructivism and constructivism.

7.1. Contributions and implications

This study thus shed empirical light on the theoretical debate between instructivism and constructivism and demonstrated that teachers' pedagogical interaction is shaped by the social context and history; teachers' previous experience and knowledge would affect their capabilities while the surrounding cultural expectation and contextual demands would determine their motives to change or not. These sociocultural forces should be added to the extant explanation that the mismatch between policies and practices regarding participatory pedagogy has been resulted from the constraining classroom realities and teachers' superficial understanding of the progressive notions (Song, 2015). It is highly possible that the Chinese teachers were willing to embrace participatory pedagogy in their classroom practices but incapable of achieving constructivism due to the cultural constraints and instructivism-oriented teacher education.

Moreover, practitioners should be culturally conscious when they conduct instruction. Advocating the notions of constructivism is far from enough in reforming the early childhood pedagogical practices in China. For policy-makers or scholars, constructivism should not be regarded as the sole foundation of decision making in

ECE, or at least, it should be adapted in the local contexts. Chinese traditional culture and local context should be taken into serious consideration when we try to understand teachers' pedagogical interactions in Chinese kindergartens. As aligned with the theory of change (Funnell & Rogers, 2011; Weiss, 1995), when the educational authorities issue new guidelines, the intended outcomes, the activities to realize the outcomes and the contextual factors should be targeted as a whole to promote the educational reforms. Both the aims and means should be carefully considered (Weiss, 1995). A more comprehensive perspective involving culturally, contextually, and child-individually appropriate practices (3CAPs) could be taken into consideration to bridge the policy-practice gap (Li, 2008; Yang & Li, 2019). In addition to the belief-practice gap as revealed in teachers' pedagogical practices (Li, Wang, & Wong, 2011), this research has unveiled the gap between the form and function of pedagogical interactions in these Chinese kindergartens. This implies that the Chinese teachers were trying to implement participatory pedagogy in practice, with a similar form but different function. It would be valuable if more practical guidance and support could be provided to enhance early childhood teachers' professional development. This will then assist Chinese teachers in conducting participatory pedagogy in a culturally appropriate way to scaffold children's active learning.

7.2. Limitations and future research directions

The present research could be improved in the following aspects. First of all, in terms of the sample, the participating kindergartens were limited in Shenzhen, a special economic zone located in southeastern China, which has its unique features in educational resources and local culture; therefore, the generalization of current findings to the whole China should be cautious. Second, this research used secondary data from a larger project. Limitations unavoidably exist as much information could not be explored, such as principals' and parents' perspectives towards the pedagogical interaction. More empirical evidence is needed to provide a more nuanced picture of pedagogical interaction in Chinese kindergartens. Third, this research only focused on pedagogical interaction without considering other related aspects which might have partially common objectives and significance, such as the teacher-child interaction in learning-center activities and the peer interaction. Whole-class instructional activities derived from the traditional pedagogy, thus, would be inevitably influenced by traditional Chinese philosophies (Zhu & Zhang, 2008) and might not be a suitable example to reflect the influence of western, progressive education. Therefore, more future research on the teacher-child interaction in other learning settings is needed to better understand early childhood pedagogy in China and other societies.

Notes

1. A conversational turn refers to a statement by teacher or child in the dialogue, which consists of one or more sentences with the same argument.
2. Pseudonyms are used for all the teachers mentioned in this article.

Author notes

Competing interests: The authors declare that they have no competing interests.

Authors' contributions

RH carried out the research and drafted the manuscript. WY and HL helped to draft the manuscript. All authors read and approved the final manuscript.

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Appendix A. Supplementary data

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