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The reproduction of social stratification through recontextualizing into forms of communication in Chinese secondary classrooms

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A B S T R A C T

Schooling is widely acknowledged as an apparatus to legitimate and reproduce social inequality. However, its internal mechanisms through which it perpetuates social segregation remain under explored. Drawing on Bernstein's concept of recontextualization, this study takes various forms of communication in classroom practices as the indicator to recover their underlying regulative principle. Thirty-four classroom videotapes from three stream schools in China were coded and analyzed. The results show class disparities in the duration of peer interactions, the quality of classroom interaction, and the teachers' instructional support across three streams of schools. Teachers from higher-stream schools allocate more time to peer interaction, which correlates with enhanced classroom interactional quality and teachers' instructional support. In addition, the duration of peer interaction acts as a mediator, influencing the quality of interaction and teachers' instruction, which are the direct predictors of students' school achievements. These findings suggest that social class differences are transformed and legitimized into differential durations of peer interaction, which mediate classroom quality and then stratify students' school achievements, ultimately reproducing social stratification.

1. Introduction

A large number of studies has recognized that schooling often reproduces social inequality rather than mitigating it (Althusser, 1971; Apple, 1982; Bernstein, 2000; Bourdieu, 2006). Rooted in middle-class values, norms, and practices, the education system functions as a mechanism for maintaining social stratification by favouring middle-class students who align with these values while marginalising working-class students who do not. In China, the education system similarly appears to favour students from higher social class backgrounds. The increasing class disparities among urban and rural students in Chinese elite universities have led scholars to widely agree that social structures are solidifying within the country, closing off education as a pathway for social mobility (Wu & Treiman, 2004; Zhang, 2011; Zhou & Xie, 2019).

However, extant studies mainly portray schooling as a neutral site that reproduces social stratification through operating on pre-existing social inequalities rooted in students' family backgrounds (Hoadley, 2005; Jenkins, 1982). Limited attention has been given to its internal operations, which leads to marginalized groups often accepting the reproduction of their subordinate positions in the social hierarchy rather than challenging them. Bernstein's concept of recontextualization provides a valuable insight into addressing this

phenomenon. It argues that macro-level social rules are transformed and legitimized into micro-level pedagogic communication, which permeates into and shapes students' social consciousness, thereby achieving an invisible transmission of these power dynamics (Bernstein, 2000).

As such this study aims to explore how class differences are transformed and legitimized within pedagogic communication to facilitate the implicit transmission of social relations in China. This study identifies different forms of communication, which, as Bernstein (2000)) argues, carry varying degrees of power relations, as a possible pathway for recontextualization. Additionally, interaction quality, which is closely linked to communication forms and is a significant predictor of students' academic outcomes (Cadima et al., 2014; Downer et al., 2010), is used as an indicator of students' academic achievements. This study examines the impact of class-based differences in communication forms on interactional quality to explore their potential functions in transformation and legitimation of class differences.

2. Theoretical framework

2.1. Recontextualization

Recontextualization refers a process that discourse is "selectively relocates, refocuses, and relates other discourses to constitute its own order" (Bernstein, 2000, p. 47). The activities or practices in the new context, however, continue to be dominated by the original. Bernstein develops his theory of pedagogic discourse as a recontextualized principle to articulate how this process plays out.

Pedagogic discourse consists of a set of rules embedded in two interrelated discourses: instructional discourse and regulative discourse. Instructional discourse pertains to the transmission and acquisition of competence, skills, and knowledge, as well as their interrelations. Regulative discourse is concerned with social order, which dominates instructional discourse, thereby creating internal order within instructional discourse. Specifically, instructional discourse includes rules regarding the selecting, sequencing, pacing of knowledge, and evaluative criteria. Regulative discourse encompasses social rules, such as race, gender, and social class. These social rules, as underlying regulative principles, achieve implicit transmission by being transformed and legitimized into varying degrees of control over the rules within instructional discourse.

2.2. Classification and framing

Bernstein (2000)) defines instrumental concepts classification and framing as translations of power relations and principles of control to analyze how regulative discourse governs rules of instructional discourse, in order to exhibit the recontextualization process from the macro social structures to micro pedagogic practices.

According to Bernstein (1981)), inequalities in the distribution of power—regarded as the most fundamental regulative principle—both between and within social groups, create class relations, which manifest as relationships of exploitation and being exploited. The upper class seeks to perpetuate these dominant and subordinate relationships and so forms of consciousness to maintain their power hierarchy. This perpetuation of power relations is realized through the conduct of principles of control, which "generate, distribute, reproduce, and legitimate distinctive forms of communication, which transmit dominating and dominated codes" (Bernstein, 1981). Individuals are socialized into these differential communication forms and internalize these codes carrying power relations. Consequently, they are differentially positioned by these codes in the process of their acquisition, constructing their respective class consciousness. As a result, class relations achieve their transformation and legitimation, transmitting power hierarchy invisibly.

Bernstein introduces classification to represent the degree of insulation between social groups or between agents within a social group created by power relations. When the insulation is robust, the boundaries between social groups or agents clearly marked, the classification is strong, denoted as C^+. Conversely, when the insulation is minimal, representing blurred boundaries, the classification is weak, marked as C-. The realisation of classifications relies on operation of framing. Framing refers to degree of control over the transmission and legitimation of messages and symbols within communication. Specific into pedagogic practices, framing "refers to the degree of control teachers and students possess over the selection, sequencing, pacing, and evaluation of knowledge transmitted and received in the pedagogical relationship" (Bernstein, 2003b, p. 80). Strong framing, noted as F^+, refers to teachers explicitly dominate classroom communications, while weak framing, noted as F-, signify that students apparently predominate the task selections and instructional rhythms. Researchers argued that a weak framing of pedagogy is progressive (Bernstein, 2000; Moore & Muller, 2002; Morais, 2002) because it views students as active, creative, interactive, and constructive learners (Bautier, 2011; Bernstein, 2000). Students are encouraged to initiate activities and cooperate, discuss, and debate with their teachers and peers at their own pace. Therefore, they can have a deeper understanding of the knowledge and hence to develop their own cognitive skills. In contrast, in a strong framing pedagogy, students are perceived as obedient and industrious, acting as passive receivers of knowledge transmitted by their teachers.

The strengths of framing and classification are dialectically intertwined: a weak framing inevitably corresponds with a weak classification. To achieve the appropriate strengths of classification regarding discourse, agents, space, etc., that is, the degrees of insulation, i.e., power relations, it is essential to conduct the corresponding strengths of framing to the rules of instructional and regulative discourses.

2.3. Rules of instructional and regulative discourses

To align with the research objectives and data types, this theoretical framework only specifically addresses rules of pacing within instructional discourse, hierarchical rules within regulative discourse, and the classification strength of space.

2.3.1. Pacing

Pacing refers to the "rate of expected acquisition" (Bernstein, 1981), representing the rhythm of the transmission-acquisition process. Strong framing in pacing indicates significant teacher control over the transmission speed of pedagogic messages. Given the inherent limitations of instructional time in classrooms, generally, teachers are granted dominance over the time use to accomplish teaching goals. Therefore, a strong framing of pacing implies high volumes and pace of messages within a specified timeframe (Ellery, 2017), potentially resulting in an inadequate comprehension by students and limiting teachers' opportunity for in-depth responses. In contrast, weak framing in pacing occurs when students control the transmission speed of pedagogic content. Students determine the rhythm of acquisition based on their understanding and learning pace, which fosters more effective teacher-student interactions and increases student engagement, as well as facilitates students to delve into exploration and construct their own understanding (Lubienski, 2004).

2.3.2. Hierarchical rules

Hierarchical rules govern the authority dynamics between teachers and students during classroom communication, as reflected in pedagogical relationships. When hierarchical rules are strong framing, teachers clearly dominate the classroom, acting as the primary knower and authoritative transmitter of knowledge. In this scenario, teachers control the selection of tasks and the pace at which it is transmitted. Conversely, a weak framing of hierarchical rules signifies a shift in the teachers' role from a transmitter to a facilitator, allowing students greater autonomy and time in the learning process (Bernstein, 2000). This approach fosters a more warm, positive and interactive, learning environment, leading to a more equal and open classroom climate.

Therefore, in classroom settings, hierarchical rules delineate the level of openness in communication. Strong teacher dominance results in less open, more imperative communication, with a unidirectional flow of knowledge from teachers to students. Here, student performance can be more easily objectified, as grades are based on how well students have mastered the content delivered by the teacher, making it easier to clarify the distribution of blame. On the other hand, a weak framing of hierarchical rules promotes more open, bidirectional communication, blurring the roles between transmitter and acquirers of knowledge. This makes it more difficult to clearly identify the transmitters of knowledge and to objectively measure student achievements, as the competencies developed through open communication are harder to assess in a short time frame.

2.3.3. Space

Insulation in space encompasses both symbolic and social life dimensions (Bourdieu, 1989). Symbolic spatial segregation involves the control that dominant classes exert over public spatial consciousness. In contrast, social spatial insulation refers to the perceived environments experienced in practice, i.e., insulation in physical space. Dominant classes achieve physical insulation through symbolic insulation, and conversely, physical insulation can reflect symbolic segregation. In classroom practices, symbolic space refers to the hierarchical authority occupied by teachers and students, which is reflected in their physical positions, the materials they use, and their movement within the classroom. Similarly, physical insulation in the classroom can reveal underlying symbolic space insulation.

A strong classification of space in a classroom is characterized by a clear but invisible boundary between the physical positions of teachers and students, which remains unbreached. Typically, teachers stand at the front, using specialized teaching materials such as computers, projectors, and remote-control devices. They deliver instruction from the podium without crossing into the students' areas. Students, on the other hand, are confined to their seats, using their own textbooks and materials, and are treated as isolated individuals. This strong classification of physical space mirrors a strong classification of symbolic space, indicating the teacher's pronounced authority over students. In this setting, teachers dominate the classroom, while students are submissive, with a strong framing hierarchical relationship. A weak classification of physical space, on the other hand, allows greater freedom of movement and the exchange of materials between teachers and students, as well as among students themselves. Teachers typically move around the classroom to provide individual support, breaking the invisible boundary and symbolizing a reduction in hierarchical authority in symbolic space. Although hierarchical relations still exist—since teachers maintain dominance—they are not as rigid as in a strongly classified space. The positions of teachers and students become more equal. When the roles of transmitter and receiver are indistinguishable in terms of symbolic space, insulation in physical space is entirely eliminated. This reduction in spatial insulation extends to peer interactions, where students can move and communicate freely, with physical space reflecting broader social norms. This context indicates the society is freer and more equal, with less control exerted by authorities.

Insulation in physical space reflects underlying power relations and the differentiated spatial awareness and spatial marking abilities of the individuals involved. A strong classification of space grid has clear boundaries set in each small space, easily recognized by students. In contrast, in a weak classification of space grid, all practices, materials and communication are mixed, requiring students to recognize and establish boundaries on their own. However, students from middle class, having acquired these abilities in daily interaction in their home, are often better equipped to recognize and mark these spaces (Bernstein, 2003b).

To sum up, the strengths of framing and classification are dialectically intertwined. A strong classification of space signifies a corresponding strong framing of hierarchical relationships. When both teachers and students are confined to fixed physical positions with limited freedom of movement, the hierarchical rules within the communicative context become easily recognizable, with teachers assuming the role of the authoritative transmitter. Conversely, a weak framing of pacing often coincides with a weak framing of space.

In such cases, students exert more control over the pace of communication, allowing for increased opportunities for questioning, discussion, and debate, which typically involve changes in physical positions and freedom of movement.

3. Research aim

This study aims to explore the recontextualization of class differences into various forms of communication, characterized by varying strengths of framing, with the goal of perpetuating the social relations. In addition, considering the potential correlations between distinct forms of communication and interactional quality—known to be influenced by class differences and identified as a significant predictor of student school achievement—this research identified interactional quality as a potential intermediary between communication forms and differentiated school achievements. The primary objective is to investigate whether communication forms regulated by social class impact interactional quality, ultimately leading to stratified student outcomes and reinforcing the legitimation and reproduction of class differences.

To achieve this research aim, three interrelated research questions are procedurally addressed:

1. Do different forms of communication correlate with the interactional quality in classrooms?
2. Do class differences present in the arrangement of communication forms and the interactional quality across streams of schools?
3. If so, do these varying communication forms amplify or diminish class differences in interaction quality between different streams of schools?

4. Methodology

The data were collected from the "One Teacher, One Excellent Course," an online platform established by the Chinese Ministry of Education, currently the largest database of teaching videos in China. This platform serves as a hub where teachers share their instructional videos and materials, seeking feedback from peers across the nation to enhance their teaching and classroom management skills. As a result, the platform provides access to teaching videos covering all subjects, streams of schools, and districts nationwide.

4.1. Samples

4.1.1. Sample selection and contextualization

Xi'an was selected as the study location because it embodies characteristics representative of China's broader urban-rural dynamics and socioeconomic diversity. As a major city in Northwest China with over 12 million residents, Xi'an encompasses both affluent urban areas and less-developed rural regions. This diversity allows us to examine pedagogic practices across different social classes within a single geographic area.

The city hosts a variety of educational institutions, including urban private schools, urban public schools, and rural public schools. This range reflects the different streams in China's education system, providing a comprehensive context to study how class differences are recontextualized into pedagogic communication forms (Wang & Liu, 2017). The socioeconomic disparities and educational resource distribution in Xi'an mirror those found throughout China, making it a suitable microcosm for exploring social stratification in education.

While recognizing that regional variations exist across China, Xi'an's blend of historical significance and contemporary development offers valuable insights applicable to other regions with similar socioeconomic structures. By situating our study in Xi'an, this study aims to capture patterns and mechanisms relevant to the broader Chinese educational landscape.

4.1.2. Sample description

The selected classrooms in this study are eighth-grade classrooms and Mandarin-speaking. The eighth grade was chosen because students in this grade are more familiar with the school environment than seventh graders and face less stress than ninth graders preparing for the High School Entrance Examination (ZhongKao).

The study involves 34 teachers (12 males, 22 females). A stratified random sampling method was employed to select video recordings from 34 classrooms across three streams of schools: upper stream (urban private, $N = 12$), middle stream (urban public, $N = 14$), and bottom stream (rural public, $N = 8$). The categorisation of streams is based on schools' socioeconomic statuses (SES), considering their locations (urban or rural) and financial resources (from local government for public schools or school operational revenue, such as tuition fees for private schools). This categorisation is rooted in the long-standing urban-rural economic disparity, resulting in an unequal distribution of educational resources. Public schools within the same district receive more financial support from local government than their private counterparts. Rural private schools in this study were excluded due to their limited numbers.

The overall mean class size for samples was $M = 42$, SD=10.5, with specific details for each school stream: upper stream ($M = 44.36$, SD=9.5), middle stream ($M = 41.7$, SD=8.8), and bottom stream ($M = 38.4$, SD=14.3). However, an independent *t*-test revealed no significant difference in class size between school streams.

4.2. Measures

4.2.1. Forms of communication

This study developed five codes to label the identified forms of communication. Initially, four prevalent forms: (1) Teacher and Whole-Class communication (TW), (2) Teacher and Individual student (TI), (3) Teacher and Small groups interaction (TS), (4) Peer Interaction (PI), were identified based on students' speaking time, which served as an indicator of the degree of control students have over pedagogic practices, reflecting their authority and hierarchical position within the classroom. The standardized Bernsteinian notions were employed for sequentially coding of these communication forms, ranging from strongest to weakest (C^{++}, C^{+}, C^{-}, C^{--}; F^{++}, F^{+}, F^{-}, F^{--}). Additionally, an unobservable form of communication, students working independently on tasks (ST), as suggested by Hoadley (2006), was incorporated and coded as F^{0} to represent moments without observable interaction.

Subsequently, three videos from each stream of schools were randomly selected for the initial round of coding. The results showed a general alignment between the assumed five forms of communication and those observed in the classroom. However, a notable finding was the limited occurrence of teacher-small group interaction, replaced by a blend of teacher-multiple individual communications. This led to the replacement of the form Teacher-Small groups (TS) with Teacher-Multiple students (TM), coded as F^{-}. The detailed descriptions of these five forms of communication are:

(1) TW (F^{++}): TW signifies a dominance of teachers in interactions, resembling a teacher's "monologue". In this form, teachers, as authoritative primary knowers, transmit knowledge to students who listen without speaking time or the opportunity to negotiate interactions (Molinari & Mameli, 2013; Nassaji & Wells, 2000; Scott et al., 2006). This strong framing is denoted as F^{++}.
(2) TI (F^{+}): TI is a globally common communication form, typically involving the teacher asking a question, a student responding, and the teacher providing confirmation or feedback. Compared to teacher monologues, TI allows students a brief opportunity to speak. However, since the speaking time is shorter than in other forms, it is coded as F^{+}.
(3) TM (F^{-}): TM is a common form of interaction observed in the first round of coding, involving teachers asking a student to answer questions. The teacher then invites another student or the entire class to comment on the answers. Alternatively, students may question the feedback given by their teachers to questions asked by another student. This form, involving more than two agents and extending speaking time for students, is indicative of a relatively weak strength of framing (F^{-}) compared to TW and TI.
(4) PI (F^{--}): Peer interaction involves students taking the lead in a task or activity, gaining increased opportunities and autonomy to initiate discussions, propose arguments, and collaborate in groups. This represents a shift of power from teachers to students, leading to a blurred hierarchical relationship. Thus, peer interaction is coded as F^{--}.
(5) ST (F^{0}): During moments without observable interaction, such as when students work on tasks individually, the framing is noted as F^{0}. Doing exercises independently is common, particularly in STEM courses, where students need their 'alone time' to understand, calculate, and solve problems. Apparent communication between them is unobservable. In this context, the framing is noted as F^{0} (Hoadley, 2006).

To measure duration of each form of communication, Vosaic, a video recording and analysis software derived from "Studiocode" was employed. Prior to encoding, five tags corresponding to these five strengths of framing were created to record each form's starting and ending time. Throughout the coding process, special events and moments were promptly marked and commented on in real-time. Upon completing the coding for an entire class, an analysis report for each video, including total times of communications, total duration, and breakdown of each code, were subsequently generated and exported for further examination.

4.2.2. Classroom interactional quality

The Classroom Level Assessment System Score-Secondary (CLASS-S), developed by Pianta et al. (2012), served as the instrument for evaluating classroom interactional quality. CLASS-S is a comprehensive tool designed to assess overall interactional quality and its domains, encompassing 11 specific dimensions: emotional support (positive climate, negative climate, teacher sensitivity, regard for student perspective), classroom management (behaviour management, productivity, instructional learning formats), instructional support (concept development, analysis and inquiry, quality of feedback), and student engagement. In addition, its applicability and validity have been demonstrated in numerous studies across various social contexts and cultures (Cadima et al., 2010; Gamlem, 2019; Hu et al., 2016; Virtanen et al., 2018).

A seven-point Likert scale was employed to score each dimension, ranging from low (1, 2), middle (3, 4, 5) to high (6, 7). This was done following the detailed instructions and examples outlined in the CLASS-S Manual (Allen et al., 2011; Pianta et al., 2012; Westergård et al., 2019). The dimension "Negative Climate" was excluded from this study due to its infrequent occurrence. Observations commenced at the beginning of the class when a teacher began instruction and ended with the teacher saying, "class is over". Each lesson lasted approximately 40 min. Coding segments (10 min each) and scoring segments were conducted, with each dimension scored three times during viewing and revised in the last 10 min. The total score for each variable was calculated based on the average rating recorded. For example, (positive climate 1 + positive climate 2 + positive climate 3)/3=the final score for positive climate. Similarly, the total score for each domain was the average total score of all subordinate dimensions.

4.3. Data analysis

The data analysis consists of descriptive analysis, correlation analysis, regression models, and mediation effect analysis. Initially, SPSS version 26 was utilised for descriptive statistics, including durations of each form of communication and interactional quality, along with Pearson's correlations between the two. Mean values of classroom quality and durations of each communication form in the three streams of schools were then examined. ANOVA was used to estimate variances between streams of schools in these variables.

A mediating model was hypothesized to explore the role of durations of communication forms played in the stratified interactional quality in classroom. Two regression models were established to examine the effect of school streams on interactional quality and its domains, revealing a significant variance between streams (path C). Categorical variables representing streams of schools were set as dummy variables, with upper-stream schools serving as the reference group. The constant in the models represented the mean quality of upper-stream schools, while the remaining school streams entered the models as predictors. The coefficient equated to the total effect size, which would not be further analyzed for mediating effect if it proved to be insignificant (Wen & Ye, 2014; Zhao et al., 2010).

Mediating regression analysis was conducted using SPSS Process 3.4.1 (Preacher & Hayes, 2020). This involved examining the effect of school' SES on the duration of each communication form, the mediator (path a), and the effect of the mediator on interaction quality and its dimensions, the outcome variables (path b). Only durations of communication forms exhibiting significant variance across school streams showed in previous investigation were examined. The indirect effect, represented by a*b or C—C', was calculated. Finally, to test the reliability of the mediating effect of each variable, confidence intervals of indirect effects and their significance were assessed through the bootstrap resampling method. The strength of each estimated mediating effect was displayed through the ratio of the indirect effect to the total (Shrout & Bolger, 2002), which is a more accurate representation than a simple presentation of a full or partial mediating effect. This mediating effect model is illustrated in Fig. 1.

4.4. Validity and reliability issues

Cronbach's alpha for these three domains and all 10 dimensions were computed to be $\alpha=0.826$ and $\alpha=0.913$, respectively, indicating high internal consistency for each of the CLASS-S domains and indicators.

5. Results

5.1. Descriptive statistics

Table 1 presents descriptive statistics, including the means (M), standard deviations (SD), minimum (Min) and maximum (Max) scores for each variable. The overall interaction quality in these classrooms fell within the middle level ($M = 4.32$, SD=0.61), with instructional support emerging as the strongest ($M = 4.62$, SD=0.71) and emotional support as the weakest ($M = 3.61$, SD=0.85). These results suggest that teachers provide moderately positive support for the academic needs but a comparatively weaker support for emotional needs for students. In terms of durations of various forms of communication, as expected, a significant portion of classroom time is spent on communication with the whole class (F^{++}), characterized by a very strong framing ($M = 46.32$, SD=18.3). This indicates that teachers dominate the classroom activities in this context. Peer interactions, which are marked by the weakest framing (F^{--}), occupied the second-largest portion of classroom time, slightly higher than proportions devoted to teachers' interaction with
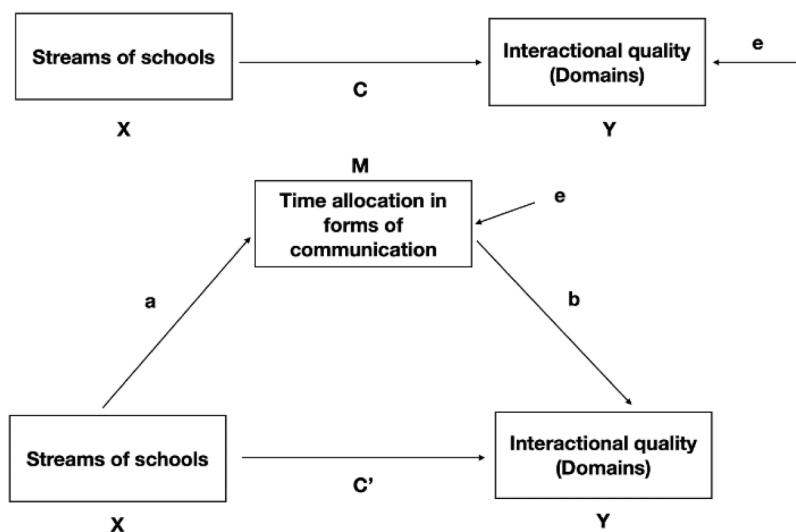

Fig. 1. Mediating effect model.
Note: X= Predictor, Y= Outcome, M= Mediator, C= Total Effect, C'= Effect Direct, b= Mediating Effect.

Table 1

Description of durations of each form of communication and interactional quality and its domains.

Variables	M	SD	Min	Max
Quality	4.32	0.61	3	5.55
Emotion	3.61	0.85	2	5.33
Organization	4.3	0.51	3	5.33
Instruction	4.62	0.71	3.2	6
TW (F^{++})	46.32	18.3	11.86	77.73
TI (F^{+})	14.92	9.93	0.32	35.98
TM (F^{-})	7.16	5.97	0.37	22.21
PI (F^{--})	17.33	14.39	0	55.94
ST (F^{0})	14.21	9.56	1.55	36.27

Note: M=Mean, Min=minimum, Max=maximum, SD=standard deviation, TW=Teacher-Whole class, TI=Teacher- Individual student, TM=Teacher-Multiple students, PI=Peer Interaction, ST=Students-Tasks.

individual students (F^{+}) and student doing exercises (F^{0}).

5.2. Correlations between duration of each form of communication and quality of interaction and its domains

The relationship between durations of various forms of communication and interactional quality, along with its three domains is presented. The results of Pearson product-moment correlations ($N = 34$) presented in Table 2 reveal significant relationships between communication forms and interactional quality, as well as some of its specific domains. First, the data show that all domains of classroom quality are highly positively intercorrelated, indicating that in a highly structured classroom, elevated emotional support aligns with high teacher instructional quality. Conversely, the durations of each communication form are negatively correlated with one another, given their mutually exclusive as they collectively constitute an entire lesson.

Additionally, the results reveal that the allocation of time to distinct communication forms indeed correlates to interactional quality and its instructional dimension. Specifically, time assigned to whole-class interaction, primarily teachers' monologue, presents a significant negative correlation with emotional and instructional support. This suggests that an extended period of strong framing associated with lower psychological and academic quality in classroom. Teachers' monologues represent a strong framing of pacing, where teachers control the rate at which students acquire knowledge. In this communication form, teachers dominate classroom time, conveying pedagogic messages based on the syllabus and their perceptions of students' abilities, rather than individual student comprehension. This dominance restricts opportunities for student inquiry and discussion, reducing the frequency and quality of teacher feedback, which is essential for effective instruction. Furthermore, during teachers' monologues, teachers exert high authority, acting as the primary knower and transmitting pedagogic messages unidirectionally to the entire class, leaving no dialogic space for students and paying less attention to students' emotional needs. This form of communication is characterized by a strong framing of hierarchical rules and aligns with a strong classification of physical space, creating an invisible but clear boundary between teachers and students in classroom. Consequently, both relational and spatial insulations in the classroom contribute to a less positive and warm climate, restricting movement and interaction. As a result, a higher percentage of classroom time dedicated to whole-class communication correlates with lower emotional quality.

In contrast, the duration of peer interaction, the form characterized by the weakest framing, shows noteworthy correlations with all domains of interactional quality. This indicates that weaker teacher control over communication is associated with higher interactional quality in the learning process. The possible reasons might be, during peer interaction, students predominate the classroom communication and control the proceeding of activities at their own pace. This potentially leads to a higher emotional and instructional quality. Specifically, these correlations indicate that when students' control pace, they create a more open and participative environment, facilitating engagement in classroom discussion and cooperative learning. In this form, teachers' identity shifts to that of a facilitator, providing scaffolding, selecting tasks, offering suggestions and delivering individualized support or feedback to stimulate students' self-reflection. Teachers show less authority during classroom communication, representing a weak framing of hierarchical

Table 2

Correlations between domains of interactional quality and durations of forms of communication.

	Emotion	Organization	Instruction	TW	TI	TM	PI	ST
Emotion	—							
Organization	.59**	—						
Instruction	.80**	.74**	—					
TW	−0.41*	−0.28	−0.42*	—				
TI	−0.06	−0.14	0.002	−0.39*	—			
TM	0.13	0.07	0.05	−0.45**	−0.03	—		
PI	.54**	.40*	.54**	−0.56**	−0.12	−0.06	—	
ST	−0.05	0.05	−0.06	−0.38*	−0.11	.36*	−0.26	—

* $p < 0.05$ (two-tailed).
** $p < 0.01$ (two-tailed).

rules, fostering a more relaxing classroom atmosphere and closer pedagogic relationships. Additionally, during peer interactions, teachers typically walk around the classrooms, observing students' status and ready to be providing emotional and academic support as needed. Students, in turn, experience greater freedom of movement within the classroom, allowing them to interact and discuss with peers, as well as in exchanging material. This breaks down spatial insulation—the physical boundaries between teachers and students—signifying a weak classification of space. The weak hierarchical relationships and spatial boundaries create an emotionally supportive environment, which, in turn, reduces off-task behaviour and encourages student inquiry. Consequently, the qualities both of classroom organisation and teacher instruction are identified as high.

The results in this table shed light on the interplay between communication forms and various domains of interactional quality, suggesting that interactional quality may serve as a bridge between varying communication forms and the stratified school achievements. This paves the way for the further exploration in subsequent investigation.

5.3. Class differences in forms of communication and quality of interaction

The results presented in Table 3 reveal significant class-based disparities in both the time allocated to different communication forms and the quality of interactions across schools from different streams.

Table 3 first displays the mean values and standard deviations for the durations of five communication forms. Notably, a significant difference emerges in the time used to peer interaction ($F = 6.03$, $p = 0.01$), with teachers in upper-stream schools dedicating a substantially larger portion of classroom time to peer communication ($M = 26.35$, SD=9.99). This accounts for more than a quarter of the total classroom time and is significantly higher than the durations observed in middle-stream schools ($M = 15.99$, SD=16.89), and nearly three times longer than in bottom-stream schools ($M = 7.25$, SD=7.05). These disparities suggest that as the stream of schools increases, there is a corresponding increase in the duration of weak framing of communication forms, aligning with a weak framing of pacing. This implies that students in higher-stream schools have greater control over the transmission of pedagogic messages, allowing them to govern the rate of knowledge acquisition at their own pace. This autonomy in learning may contribute to a deeper comprehension of esoteric knowledge, thereby laying an indirect foundation for their varied academic achievements. Moreover, the class differences exhibited in time allocated to peer interaction also suggest that teachers in higher-stream schools are less authoritative, fostering an environment with more equitable opportunities for student participation and discussion in classroom activities.

Noticeably, the form of communication between teachers and the whole class, which constitutes the majority of classroom time, shows no statistically significant differences across school streams ($F = 1.51$, $p = 0.24$). This indicates that a teacher-centred mode of communication predominates in secondary school classrooms across social streams in China.

The lower half of Table 3 reveals significant differences in the quality of classroom interaction and its instructional domain ($F = 3.54$, $p = 0.04$; $F = 5.55$, $p = 0.01$). Interaction quality and instructional effectiveness are highest in upper-stream schools ($M = 4.62$, SD=0.39), followed by middle-stream schools ($M = 4.3$, SD=0.76), and are lowest in bottom-stream schools ($M = 3.96$, SD=0.38). These findings address the first two research questions of this study, demonstrating that in pedagogic practices, the allocation of time to different communication forms and the quality of overall interaction and instruction provided by teachers are regulated by the principle of social class.

5.4. Mediating role of duration of communication forms

The aim of this study is to investigate how class differences are recontextualized into forms of communication that implicitly sustain social stratification. Interactional quality is used as the indicator of school achievement to measure whether communication forms achieve this recontextualization by stratifying interactional quality across different school streams. To this end, two regression models (path C) were initially established to examine the total effect of school streams on interactional quality and instructional quality, respectively.

As shown in Table 4, the effect of middle-stream schools on interactional quality is statistically insignificant, suggesting that there is no mediating relationship between middle-stream schools and their interactional quality. As a result, further analysis of mediating

Table 3

Differences presented in durations of communication forms and qualities of overall interaction its three domains across three streams of schools.

	Upper-stream		Middle-stream		Bottom-stream			
	Mean	SD	Mean	SD	Mean	SD	F	p
Forms of Communication								
TW	45.09	12.08	41.52	20.86	54.9	20.13	1.51	0.24
TI	15.06	9.01	15.71	10.94	13.6	10.61	0.12	0.89
TM	4.61	3.54	9.68	6.2	6.94	7.21	2.46	0.1
PI	26.35	9.99	15.99	16.89	7.25	7.05	6.03	0.01
ST	8.89	7.09	17.11	9.61	17.1	10.22	3.25	0.05
Quality								
Overall Interaction	4.62	0.39	4.3	0.76	3.96	0.38	3.54	0.04
Emotional	3.81	0.59	3.79	1.08	3.11	0.58	2.35	0.11
Organizational	4.53	0.36	4.23	0.63	4.11	0.41	2.06	0.15
Instructional	5.07	0.43	4.54	0.82	4.15	0.53	5.55	0.01

Table 4
Predictors of interactional and instructional quality in different types of schools.

	Model 1			Model 2		
	Interactional Quality			Instructional Quality		
	R^2	B	SE	R^2	B	SE
	0.186*			0.263**		
(Constant)		4.621**	0.163		5.067**	0.182
Middle-stream		−0.317	0.226		−0.528*	0.253
Bottom-stream		−0.661**	0.249		−0.911**	0.278

* $p < 0.05$ (two-tailed).
** $p < 0.01$ (two-tailed).

effects was only conducted on the three paths that exhibited significant coefficients.

Table 5 presents the results of two mediation models, where upper-stream schools serve as the reference group, and middle-stream and bottom-stream schools are the predictors. The duration of peer interaction is treated as the mediator, while interactional quality and instructional quality are the outcome variables. The effects of the predictors on the mediator were the same across both models (path a) and are therefore presented only once in Model 1. Both the standardized coefficients (β) and standard errors (SE) for each "path a" and "path b" are reported, along with the unstandardized coefficients, which allow for substantive interpretation of the results (Zhao et al., 2010).

The analysis reveals that the coefficients for each path are significant, indicating that school stream significantly predicts the duration of peer interaction, symbolising the weakest framing in pedagogic communications. Upon the mediator entering the models, its effect on the outcome variables becomes significant (path b). Conversely, the direct effects of the predictors on the outcome variables are no longer significant (path C'), suggesting that the influence of school streams on overall interactional quality and instructional support is achieved through the mediating role of duration of peer interaction.

As presented in Table 6, taking upper-stream schools as the reference, the confidence interval for the indirect effect of middle-stream schools includes zero, indicating that the indirect effect is not significant. This suggests that the duration of peer interaction does not mediate instructional quality in middle-stream schools. In contrast, the confidence intervals for the mediating effects in bottom-stream schools, concerning both interactional and instructional quality, do not include zero, confirming the significance of these indirect effects. Specifically, when upper-stream schools are used as the reference group, the duration of peer interaction in bottom-stream schools—representing the weakest framing of communication—exerts a significant indirect effect on both overall interactional and instructional quality. Furthermore, the mediation effect explains 54.97 % of the total effect on interactional quality and 39.37 % on instructional quality. This finding underscores that the duration of peer interaction serves as a crucial mediator between bottom-stream schools and the quality of interaction and instruction referred to upper-stream schools.

6. Discussion

This study aims to examine how macro-level social class differences are transformed and legitimized through micro-level pedagogic communication, thereby subtly perpetuating social inequality. By analyzing the duration of various communication forms and the quality of classroom interactions and teachers' instruction across three distinct school streams, the study identifies class-based disparities in these areas. It also reveals that the duration of peer interaction mediates the relationship between school streams and the quality of classroom interactions and instruction. Drawing on Bernstein's theoretical framework, the study demonstrates how stratified

Table 5
Mediating analysis models.

		R^2	B	SE
Model 1:	Predictor			
PI		0.28**		
	MS (path a)		−10.36*	5.04
	BS (path a)		−19.10**	5.55
Quality		0.33**		
	MS (path c')		−0.12	0.22
	BS (path c')		−0.3	0.27
	PI (path b)		0.02**	0.01
Model 2				
IQ		0.33**		
	MS (path c')		−0.33	0.25
	BS (path c')		−0.55	0.31
	PI (path b)		0.02*	0.01

Note: PI=Peer Interaction, IQ=Instructional Quality, US=Middle-stream, BS=Bottom-stream;.
* $p < 0.05$ (two-tailed).
** $p < 0.01$ (two-tailed).

Table 6
Summary of the mediated paths tested from bootstrap resampling method.

Mediated path tested	Lower CI	Upper CI	Indirect effect(β)	total effect(β) (ab+c')	Proportion
BS schools to OIQ through PI	−1.1515	−0.2042	−0.6	−1.09	54.97 %
MS schools to IQ through PI	−0.7235	38	−0.28	−0.74	
BS schools to IQ through PI	−0.9731	−0.0994	−0.5	−1.28	39.37 %

Note: OQ=Overall Interactional Quality, IQ=Instructional Quality, PI= Peer Interaction, MS=Middle-stream, BS= Bottom-stream;.

peer interaction durations, marked by weak framing, reinforce social stratification.

6.1. Durations of forms of communication

Class disparity presented in duration of peer interaction provides statistical support for the proposition of Bernstein (2000) that communication forms are established on class relations. Specifically, teachers in higher-stream schools allocate more time to peer interaction, reflecting an extended period of weak framing of hierarchical rules in pedagogic communication. This suggests that in these schools, teachers transfer greater control over classroom processes to students, thereby diminishing their authoritative presence. This finding aligns with Hoadley's (2005) assertion that educators from higher social classes typically exhibit less authority in classroom interactions.

From the students' perspective, having control over the pacing of message acquisition represents that students are situating in a more relaxed classroom environment and closer teacher-student relationships, which can facilitate their participation and discussion in classroom activities. Consequently, this may explain the higher overall quality of interaction observed in their classrooms. Furthermore, this increased student control, characterized by weak framing, aligns with the mode of "progressive pedagogy" (Moore & Muller, 1999), which enhances students' understanding of pedagogic content (Alexander, 2018) and establishes a solid foundation for successful learning (Morais, 2002). Additionally, peer interaction plays a significant role in developing students' self-reflection and self-regulation skills, which are highly valued by the middle class. This finding supports the argument that in schools structured around middle-class norms, higher-stream schools allocate more time to this progressive pedagogy to nurture these skills, while lower-stream schools provide shorter durations for the same purpose. These skills serve as criteria for selection and exclusion in the labour market, leading to the allocation of students into different social divisions and ultimately reinforcing hierarchical social relations.

The class differences in the duration of peer interaction may be attributed to the increased educational costs, both in financial and time investment required. First, weak framing pedagogy demands highly qualified teachers with a strong pedagogic content knowledge, which incurs substantial training costs. Higher stream schools, with greater financial resources and reputation, are better equipped to attract such teachers and to provide ongoing in-service training. In contrast, lower stream schools, particularly those at the bottom, are unable to offer such resources. Additionally, the time cost for teachers themselves, who must carefully plan activities for weak framing interactions in advance, is a crucial factor.

As expected, the time allocated to whole-class communication constitutes the largest proportion of classroom time. For teachers, communication with whole class enhances teaching efficiency and ensures fluent pedagogic practices (Chiang et al., 2021). Additionally, this duration does not exhibit significant stratified differences across school streams. This could be attributed to the persistent teacher-centered teaching model in Chinese education, deeply rooted in Confucian traditions. Another possible reason might be the intense competition within the Chinese education system and labour market, exacerbated by the large population, which creates immense pressure on both students and teachers. The teacher-led instructional model, with its visibility and easily quantifiable outcomes, facilitates the clear allocation of responsibility (Bernstein, 2000). For teachers, this approach, which emphasizes short-term student performance, allows them to reflect on and adjust their teaching practices based on students' mastery of the content.

Contrary to expectations, the duration of teacher-whole class communication does not show a significant correlation with classroom management, which was anticipated to exhibit a strong relationship. Bernstein's insights provide a possible explanation: classroom management, particularly in terms of student behaviour, often operates implicitly and may not be observable. This is because students have already mastered and adapted the syntax governing classroom processes within the given societal context. However, this does not mean that teacher control has disappeared. Once disruptions occur, teachers are likely to reassert apparent control for keeping order (Bernstein, 2003a).

6.2. Quality of interaction and instruction

The quality of interaction and instruction within classrooms reveals significant hierarchical disparities. These findings challenge the conclusions of O'Brien and Pianta (2010), who also utilized the CLASS instrument to compare the quality of classroom interactions and teachers' instruction in public and private schools. Their study suggested that classroom processes do not significantly differ between the two types of schools, despite the common perception of private schools as superior. In contrast, the current study demonstrates that higher-stream schools offer substantially better interactional and instructional quality, which are direct predictors of student school success (Goble & Pianta, 2017; Howes et al., 2008; Pianta et al., 2016). The discrepancies between these studies may stem from variations in cultural contexts and educational systems across different societies. Nonetheless, the findings align with the proposition of the new sociology of education that schools function as filters, whereby students from different social classes access

varying qualities of education and teaching resources, ultimately reinforcing their entrenchment in hierarchical social divisions as they progress within educational institutions.

6.3. Mediating effect of peer interaction

The mediating effect of peer interaction on the relationship between school stream and the quality of classroom interaction and teacher instruction offers empirical evidence for the recontextualization of social inequality. Class distinctions are transformed and legitimated into differential time allocations for peer interaction, a form of pedagogic communication characterized by a weak framing. This form of communication, which embodies the syntax and norms of the middle class while cultivates abilities valued by that class, appropriates students from different social classes and are allocated varying durations based on their respective school streams. As a result, students internalize these variations in durations of this weak framing of communication form as differences in their own abilities, thus socializing them into their respective social positions. This dynamic indicates why students from lower strata tend to accept rather than challenge their subordinate positions within social relations.

6.4. Implication for the future secondary classrooms

The finding of the mediating effect of peer interaction duration suggests a potential approach for improving the quality of classroom interaction. One potential avenue is the deliberate incorporation of increased peer interaction, across all school streams. For empowering students with greater control over the pacing of their learning, educators can foster a more decentralized learning environment that promotes engagement and critical thinking.

Professional development programs for teachers should focus on strategies that promote student-centered learning, irrespective of the school's socioeconomic context. This training should cover the selection and design of pedagogic tasks that encourage student involvement and collaboration without diluting the esoteric degree of the mathematics content being taught. Additionally, it should emphasize providing directive feedback that supports student autonomy and self-reflection, rather than merely corrective feedback that focuses on assessing mistakes. Equipping teachers with these skills may help narrow the achievement gap between students from different school streams.

Policymakers can enhance these initiatives by reforming the teacher evaluation system to prioritize students' long-term competencies, such as problem-solving skills, over short-term exam performance. Such changes would grant teachers greater autonomy and flexibility to facilitate extended peer interactions, transitioning from a monologic teaching model to one that fosters student-driven understanding.

6.5. Limitation and the future study

Despite these insights, several limitations merit consideration. Firstly, the sample size is limited. Although Xi'an shares some commonalities in population structure and economic development with other cities, the vast geographical range and diverse cultures in China mean that this conclusion cannot be generalized to all classroom practices nationwide. Future research should collect larger datasets to expand the analysis to broader geographical and cultural contexts.

Additionally, the use of statistical methods restricts findings to surface-level data, portraying teachers merely as transmitters of class relations while neglecting their autonomy and agency. Future studies could employ qualitative methods, such as in-depth interviews, and collect data on teachers' demographic information to investigate how these factors influence their differentiated arrangements of pedagogic communication.

7. Conclusion

This study provides valuable evidence for the applicability of Bernstein's theoretical concepts within Chinese cultural contexts. The empirical findings support Bernstein's theory of pedagogic discourse, demonstrating that forms of pedagogic communication characterized by weak framing are regulated by underlying social class principles. Furthermore, the study reveals that the duration of peer interaction functions as a recontextualized pathway for implicitly transmitting social relations, thereby laying the groundwork for reproducing social stratification. Notably, the time allocated to peer interaction presents a potential avenue for narrowing achievement gaps and addressing educational inequities at the micro classroom level.

CRediT authorship contribution statement

Dan Li: Writing – review & editing, Writing – original draft, Validation, Supervision, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Xin Jin:** Writing – review & editing, Methodology, Data curation, Validation.

Declaration of Interest Statement

The authors confirm that there are no conflicts of interest or significant financial support that could influence the outcome of the submitted work.

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