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ORIGINAL ARTICLE

Shadowing the International Baccalaureate: private supplementary tutoring for the diploma programme in China

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Abstract This paper outlines the findings of a mixed-method study of private supplementary tutoring received by students at international schools offering the International Baccalaureate Diploma Programme (IBDP) in China. Phase One was an online survey of 151 IBDP graduates across 14 schools, while Phase Two included semi-structured interviews with school administrators, teachers, and students in five IBDP schools. Almost one quarter (23.8%) of surveyed graduates from the sample of IBDP schools reported having received private supplementary tutoring. A hierarchical regression analysis indicated that participation in private supplementary tutoring was negatively associated with final IBDP scores. Interview data illuminated that private supplementary tutoring was discouraged by most teachers and administrators due to a perception of tension with the IB's educational philosophy, a view that private supplementary tutoring is not conducive to IBDP assessments, and that providers lacked specialised knowledge of the IBDP curriculum. Nevertheless, interviewees noted that low performing IBDP students often utilised private supplementary tutoring for remedial purposes, especially for Mathematics and languages.

Keywords Private supplementary tutoring · Shadow education · International baccalaureate · International schools · China

Introduction

Around the world, a growing number of students are receiving extra help, beyond regular schooling, from a parallel system which the present paper refers to as private supplementary tutoring. Also called "shadow education", participation in private supplementary tutoring has long been recognised (Hussein 1987; Rohlen 1980; Whewell 1838). Since the beginning

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of the new millennium, such "shadowy" educational provisions have expanded to become a truly global phenomenon. Across cultures and societies, millions of students receive private supplementary tutoring to "catch up, keep up, or get ahead of their peers" (Bray et al. 2014, p. 25).

Private supplementary tutoring is typically defined as a parallel system, which mimics the curriculum of mainstream education (Bray 1999, p. 20; Marimuthu et al. 1991, p. vi). Using this definition, researchers have sought to identify various shapes and forms of the shadows. Several cross-country studies have recorded the expansion and provided comparative analyses of differences and common features of private supplementary tutoring across contexts (Aurini et al. 2013; Bray and Kwo 2014; Manzon and Areepattamannil 2014; Mori and Baker 2010; Stamatis et al. 2014). Moreover, single country studies have detailed the provision, demand, effectiveness, and other characteristics of private supplementary tutoring in Bangladesh (Hamid et al. 2009), Cambodia (Brehm and Silova 2014), Canada (Davies 2004), China (W Zhang 2014), Czech Republic (Šťastný 2016), Egypt (Hartmann 2013), Hong Kong SAR (Trent 2016), Ireland (Smyth 2009), South Korea (Choi and Cho 2016), and Turkey (Tansel 2013), as some examples. However, the vast majority of previous studies in this field have focused on educational provisions supplementary to the national curriculum of the country studied. In contrast, private supplementary tutoring received by students taking the International Baccalaureate Diploma Programme (IBDP) in the international schooling sector has yet to be fully explored.

This gap has become significant in the context of rapid growth of the IBDP, a 2-year pre-university programme recognised by higher education institutions in nearly 90 countries (IB 2016a). Globally, the number of schools offering the IBDP increased from 2049 in 2009 to 3072 in 2016. China has been among countries at the forefront of the expansion, with the number of IBDP schools increasing from 7 in 2000 to 83 in 2016 (IB 2016b). The majority are English-medium-of-instruction and operate in the international schooling sector.[1] These schools present some notable features. On the one hand, the IBDP school student body is a relatively discrete group in China defined by high socio-economic status, non-Chinese citizenship (although often with Asian heritage, see Lee et al. 2014, p. 43), and a track-record of attending universities abroad (Lee et al. 2014). On the other hand, the philosophy of the IB appears to be in tension with private supplementary tutoring, which is often associated with test-preparation (Choi and Cho 2016; Kwok 2010), due to an emphasis on "whole person" education and the development of students who are balanced, caring, open-minded, and risk takers (IB 2013).

Aiming to fill the gap, this paper outlines findings relevant to private supplementary tutoring from a larger mixed-method study of international schools offering the IBDP in China. Specifically, the study included quantitative data analysis of an online survey of 151 IBDP graduates followed by qualitative data analysis of 44 interviews with IBDP administrators, teachers, and students conducted as part of a multi-site case study of five IBDP schools in China. As part of the quantitative analysis, our research team sought to explore the following questions: (1) *To what extent do IBDP students in China participate in private supplementary tutoring?* (2) *Is private supplementary tutoring significantly associated with final IBDP scores?* Drawing on the follow-up qualitative study, we explored answers to the following questions: (3) *What are the views of IBDP administrators, students, and teachers about the linkage between private supplementary tutoring and the IBDP?* (4) *Why does private supplementary tutoring (not) work for the IBDP?*

[1] A small number of public schools in China offer IB programmes. However, this research focused on the IBDP at international schools.

Private supplementary tutoring

In the literature, private supplementary tutoring is widely referred to as shadow education. This metaphor is used because much of the educational provisions of private supplementary tutoring mimics that of mainstream education; and if the curriculum in mainstream education changes, the shadow will change accordingly (Bray 1999; Marimuthu et al. 1991). Private supplementary tutoring has become a global phenomenon, and different definitions of the term have been employed by researchers across cultures. For present purposes, the research focus is defined by three features developed from a common definition (e.g. Bray 1999, p. 20; Bray et al. 2014, p. 25; Lee et al. 2009, p. 901):

1. *"Supplementation"* This paper studies tutoring provided to supplement subjects taught in schools beyond the regular school curriculum. Specifically, it is concerned with private supplementary tutoring providing instructions for subjects included in the IBDP, with such tutoring taking place beyond regular school hours.
2. *"Privateness"* This paper only focuses on tutoring provided on a fee-paying basis. It is not concerned with unpaid tutoring provided by family members, friends, and non-governmental organisations; or with extra tutorials given by school teachers as part of their professional commitments.
3. *"Academic subjects"* This paper is focused on academic subjects included in the IBDP curriculum. The academic subjects are defined according to the six IBDP subject groups which include literature in a first language, a second language, mathematics, experimental sciences, social sciences, and arts (IB 2016c). In other studies, artistic subjects such as music or fine art have been excluded from definitions of private supplementary tutoring because they may be learned for pleasure or personal development (Bray et al. 2014, p. 25). Yet, the present study includes artistic subjects given their status as academic subjects in the IBDP.

Private supplementary tutoring has been used by students and parents for multiple purposes ranging from academic supplementation to child-minding (Zhan et al. 2013). It is often the case that students attend tutoring courses or individual instruction in the hope of improving their school grades or performance in academic examinations. However, previous studies on the effectiveness of tutoring programmes demonstrate mixed results. In Taiwan, Liu (2012) found significant positive effects from participation in private supplementary tutoring on mathematics performance in a survey of 13,978 Grade 7 students. In South Korea, Kang (2009) also identified a positive correlation between household investment in private supplementary tutoring and academic performance based on analysis of a sample of 1752 students. Y Zhang's (2013) study in China found that tutoring has mixed effects on the academic achievement of students; the findings suggested that low-achieving urban students are most likely to benefit from their participation in tutoring.

Other studies, however, have suggested that private supplementary tutoring has more varied effects on the academic performance of students. Employing data collected in Programme for International Student Assessment (PISA), Hof (2014) noted that private supplementary tutoring may have a heterogeneous and nonlinear effect and may be ineffective or even detrimental to the academic performance of students. Also reflecting on PISA data, Suter (2016) suggested that in most Western countries, time spent on private supplementary tutoring for scientific subjects was negatively correlated with PISA test scores in science.

In China, private supplementary tutoring is pervasive in urban areas with students and parents increasingly demanding "shadowy" educational provisions to mimic the national education system (Kwok 2010; W Zhang 2014). Booming economic development in recent

years has also created an increasing demand for international education such as the A Level, Advanced Placement, and IBDP[2] (Wang 2012; J Zhang 2014). The literature on private supplementary tutoring for international education programmes in China—and indeed in other contexts—remains very thin on the ground. As exceptions, J Zhang (2014, p. 29) noted that parents of international school students in China often demand "language training courses" because higher scores in language assessments are considered as a means to access higher education abroad, while Zhao (2014) reported that an extensive tutoring market for the Scholastic Assessment Test (SAT)[3] has developed in response to the expansion of international schools.

To build on this literature, it is important to explore private supplementary tutoring in new and unexplored contexts. In response, this paper focuses on private supplementary tutoring practices at international schools in China offering the IBDP.

IBDP schools in China

The International Baccalaureate has become an increasingly influential player in educational systems worldwide. The programme has experienced rapid growth at international schools in China, with almost half (48%) located in Beijing and Shanghai (IB 2016b). These schools in China have distinguishing characteristics that could potentially shape participation in private supplementary tutoring. First, IBDP students in China are concentrated in urban areas and high socio-economic groups in terms of family incomes. The average yearly tuition fee for IBDP schools in Beijing and Shanghai was US$30,000 in 2012/13, which is significantly higher than IBDP schools in other major cities in East Asia (e.g., Hong Kong, Seoul, Taipei, and Tokyo) and in other parts of the world such as the United States (Wright and Lee 2014a). Second, regulations do not permit Chinese citizens to enrol in international schools in China (KPMG 2010 p. 13), which are the focus of this research. Given that most IBDP programmes are offered by international schools, research has demonstrated that the great majority of IBDP students in China are foreign passport holders, with three-fifths (61%) holding passports from countries in North America or Western Europe (Lee et al. 2014). However, Wright and Lee (2014a) note that many students have culturally *hybrid* identities with non-Chinese passports and Asian or Chinese heritage. Third, IBDP graduates from international schools have a well-established trajectory of attending universities abroad. As an example, a survey of 1612 IBDP graduates in China between 2002 and 2012, found that three-quarters (73%) attended higher education institutions in Europe or North America, with many successful in terms of admission to the world's most prestigious universities (Lee and Wright 2016).

Based on prior research, one could assume that school location in urban areas, high socio-economic status, and association with admission to prestigious universities would make IBDP students in China inclined to participate in private supplementary tutoring (see Bray and Lykins 2012, p. 12; Tansel 2013; UNESCO 2014, p. 271). However, a counteracting factor could be the educational philosophy and assessment modes of the IBDP. Students are required to complete six subject courses alongside a Theory of Knowledge course, a 4000-word Extended Essay, and extra-curricular activities through a course called Creativity, Action, Service (IB 2016c). Through its Learner Profile, the IB sets out a commitment to the development of students who are inquirers, knowledgeable, thinkers, communica-

[2] The A Level and Advanced Placement are school leaving qualifications traditionally offered by educational bodies from the UK and US, respectively. Alongside the IBDP, the two programmes are the most commonly offered by international schools (Hayden et al. 2003).

[3] The Scholastic Assessment Test (SAT) is a standardised test used for admissions to higher education institutions in the US.

tors, principled, open-minded, caring, risk-takers, balanced, and reflective (IB 2013). To this end, assessments aim to prioritise "analysing and presenting information", "evaluating and constructing arguments", and "solving problems creatively" (IB 2016d), as opposed to memorisation. Given the breadth and forms of assessments, it could be assumed that private supplementary tutoring may be in less demand for the IBDP, as compared to the National College Entrance Examination ("*Gaokao*") which is completed by the great majority of students at domestic schools in China as a route to higher education and has been described as "a terrifying exercise in rote learning and regurgitation" (Postiglione 2014, p. 6).

Research has indicated that claims from the IB about a progressive approach are widely accepted by stakeholders ranging from parents (Doherty 2009) to IB practitioners, (Wright et al. 2016) to universities (Hill and Saxton 2014). Despite this, further studies have illuminated tensions in the implementation of the IB's educational ideals, especially in the context of international schools (Lee et al. 2012; Tarc 2009; Wright and Lee 2014b). More specifically, it has been claimed that the IBDP is viewed in narrow and instrumental terms by some parents, with the popularity of the programme relating less to the benefits of a "whole person" education than individual outcomes in terms of admission to the world's most prestigious universities (Lee and Wright 2016). In such a case, it might be expected that some IBDP students would engage in private supplementary tutoring to seek a competitive-edge in such processes.

Methods

The research presented in this paper is part of a wider study on the IBDP in China (Lee et al. 2014).[4] A mixed-method research design was employed. This was comprised of (1) quantitative analysis of an online survey of 151 IBDP graduates from 14 schools and (2) qualitative analysis of interview data from administrators, students, teachers (44 interviewees in total) from five IBDP schools. In this process, the qualitative phase sought to build on the findings of the quantitative phase (Creswell 2013). As part of the wider study, we explored the extent of private supplementary tutoring, the association between private supplementary tutoring and final IBDP scores, drivers of student participation in private supplementary tutoring, and views among stakeholders about private supplementary tutoring for the IBDP.

Part one: online survey

Data collection was achieved through gathering the names of graduates from 14 of the 52 IBDP schools in China as of 2012; including schools in Beijing (five schools), Shanghai (seven schools), Foshan (one school), and Xiamen (one school). This provided a population size of 862 students from their 2011 and 2012 cohorts with destinations for further studies. Due to privacy and confidentiality concerns, the remaining schools could not or were unwilling to participate. Given the nature of gathering alumni data (i.e., the schools provided the names of their IBDP graduates but not contact information), random sampling was not feasible. Therefore, our quantitative data were "constructed" rather than "sampled" (cf. Rothenberg 1995). Following this, our research team invited IBDP graduates to participate in our online survey based on information from university student directories, social networking websites, and the IB alumni network. In total, online survey data from 151 IBDP graduates

[4] The methodology section was reconstructed from prior publications (Wright and Lee 2014a, b), which explored different aspects from the same research project on IBDP schools China.

and their corresponding IBDP final scores, as provided by the IB regional office, were used in this analysis.

Measures for quantitative analysis included final IBDP scores,[5] private supplementary tutoring, father's highest level of education, mother's highest level of education, household income, nationality, and cohort. The variable of private supplementary tutoring was measured by asking whether graduates had sought private supplementary tutoring to help them with the IBDP.[6] The measure of education was a categorical variable (high school or lower, 2-year university, 4-year university, master's degree, or doctoral degree). The variable of household income ranged from USD 20,000 or lower to USD 180,000 or higher per year. The cohorts were coded into a binary variable according to year of graduation. The measure of nationality included Asian, Western European and North American, Others, and Combination (i.e., dual nationality).

In order to identify the association between participation in private supplementary tutoring and performance in the IBDP, we employed an ordinary least squares (OLS) model, which is a model commonly used in shadow education research for its average treatment effect (Y Zhang 2016). The following regression model was employed:

$$Y_i = \beta_0 + \beta_1 t_i + \beta_2 f_i + \beta_3 m_i + \beta_4 h_i + \beta_5 c_i + \beta_6 a_i + e_i,$$

where Y_i is the dependent variable of student i's IBDP final score at the time of graduation, t_i is student i's participation status in private supplementary tutoring (key independent variable of interest), f_i is student i's father's highest level of education (control variable), m_i is student i's mother's highest level of education (control variable), h_i is student i's household income (control variable), c_i is student i's cohort of graduation (control variable), a_i is student i's nationality status as an Asian national or not (control variable), and e_i is the error variable.

A 3-step hierarchical regression was employed to test relevant variables to final IBDP scores (as the dependent variable). A simple regression was used to comparatively evaluate the primary variable of private supplementary tutoring, and control variables of father's highest education, mother's highest education, and household income. Follow-up steps added the two control variables of student cohort classification and Asian country nationality to further reduce possible confounding effects.

Part two: multi-site case study

To build on the findings of our quantitative data analysis, a multi-site case study of five IBDP schools in China was conducted. The selection of the five schools was based on commonality with regards to (1) high academic results (higher than global and national average), (2) high tuition fees (an average of US$33,000 per year), (3) being DP-only schools (i.e., not offering other IB programmes), and (4) location in the metropolitan cities of Beijing and Shanghai. In total, interview data were collected from ten IBDP administrators, 17 IBDP teachers, and 17 IBDP students. Administrators, comprising of headteachers and IB coordinators, were interviewed on a one-to-one basis. Conversely, to facilitate discussion among participants, teacher interviews and separate student interviews were conducted as focus groups, with an

[5] The final IBDP score is ranked out 45, with a pass score of 24.

[6] The survey asked "Did you seek the following types of private supplementary tutoring to help you with the IBDP e.g., one-to-one, small group, internet tutoring, lecture-style (live), and lecture style (video recording)?" Drawing from this question, participating in private supplementary tutoring was coded as 1 = participation, 0 = non-participation. Regarding the other measures, both father's and mother's education was coded as 1 = high school or lower, 2 = two-year university, 3 = four-year university, 4 = master's degree, and 5 = doctoral degree (see Table 1 for details).

average size of four participants. The student participants were all volunteers and were in the final year of the IBDP. The interviews aimed to generate an in-depth understanding of the subjective perceptions of the administrators, teachers, and students. All interviews were audio recorded with participant consent (Table 2).

For our qualitative analysis, all of the interviews were transcribed verbatim and analysed using NVivo 10. After completing interviews at the first two schools, we began to identify emerging patterns from the data. Once all the interviews were completed, we coded the data into conceptually aligned categories or themes to identify the main findings (Miles and Huberman 1994). We also made efforts to attend to validity and reliability. Each of the interviewers coded the data independently and then compared the data coding with a partner. Finally, inter-rater reliability (79%) was checked with 15 randomly selected interview files (cf. Lincoln and Guba 1985). To ensure coverage of the most commonly mentioned and pertinent issues, our discussion focused on themes highlighted in three or more of the schools.[7]

Research findings

Online survey

The online survey revealed a range of characteristics of the IBDP graduates. As Table 1 shows, the participants had relatively high socio-economic status as measured by parental educational attainment and household income. For example, 71.5% of mothers of the IBDP students were educated to 4-year degree level or above. In addition, 59.6% reported that their family household income was in excess of US$ 80,000 per year.[8] Notably, almost one-quarter (23.8%) of the IBDP graduates indicated that they had participated in private supplementary tutoring. The average final IBDP score was 35.4 out of 45, which was higher than the average final score of IBDP graduates globally (i.e., around 30 points since 1990, see IB 2010, p. 2), and in China for 2011 and 2012 (Mean = 31.8, SD = 6.6, $N = 2680$, see Lee et al. 2014, p. 23).

Model 1 of the hierarchical regression analysis showed that three variables were significant predictors of final IBDP scores: participation in private supplementary tutoring (−.206*), and the control variables of mother's education (.255**) and household income (.177*). The following steps indicated that the control variables of cohort classification and Asian country nationality were not statistically significant to final IBDP scores.[9] Model 3 of the hierarchical regression analysis predicted estimated IBDP scores based on participation status in private supplementary tutoring and mother's level of education ($F(6, 122) = 3.646$, $p < .002$) with an R^2 of .152. Both private supplementary tutoring and mother's level of education were significant predictors of IBDP scores. Specifically, the estimated IBDP score would be 2.151 points lower if the student had received private supplementary tutoring and the estimated IBDP score increased 1.161 points for each higher level of mother's education. Most relevant to the purposes of our investigation, the analysis showed that private supplementary tutoring participation was negatively associated with final IBDP scores. This may appear as a puzzling finding, because one might assume that private supplementary tutoring is in general helpful

[7] An exception was discussion of the potential benefits of private supplementary tutoring that were only reported by participants in two of the five schools.

[8] In 2015, gross national income per capita in China was US$ 7930 per capita (World Bank 2017).

[9] The overall significance level of Model 3 decreased when the control variable of Asian country nationality was added.

Table 1 Descriptive statistics ($N = 151$)

	Frequency	Percentage
Private supplementary tutoring		
Yes	36	23. 8
No	110	72.8
Missing	5	3.3
IBDP score		
≤25	6	4.1
26–35	72	47.5
36–45	73	48.2
Missing	0	0
Cohort		
2011	66	43.7
2012	77	51.0
Missing	8	5.3
Nationality		
Asia	43	28.5
Western European and North American	87	57.6
Others (Africa, South America, East Europe)	15	9.9
Combination	6	4.0
Missing	0	0
Father's education		
High school or lower	11	7.3
2-Year University	9	6.0
4-Year University	41	27.2
Master's Degree	61	40.4
Doctoral Degree	26	17.2
Missing	3	2.0
Mother's education		
High school or lower	29	19.2
2-Year University	14	9.3
4-Year University	51	33.8
Master's Degree	43	28.5
Doctoral Degree	12	7.9
Missing	2	1.3
Household income[a]		
80,000 or lower	61	40.4
80,000 to 180,000	62	41.1
180,000 or higher	28	18.5
Missing	0	0

[a] USD

Table 2 Summary of hierarchical regression for variables correlating IB performance ($N = 151$)

	R^2	ΔF	B	SE B	β
Model 1	.153	6.220***			
Tutoring			−2.403	.945	−.206*
Father education			−.636	.417	−.138
Mother education			1.052	.376	.255**
Household income			.329	.151	.177*
Model 2	.156	4.765***			
Tutoring			−2.298	.982	−.197*
Father education			−.675	.429	−.146
Mother education			1.096	.385	.267**
Household income			.321	.158	.171*
Cohort			−.274	.827	−.027
Model 3	.152	3.646**			
Tutoring			−2.151	1.003	−.186*
Father education			−.732	.462	−.157
Mother education			1.161	.401	.283**
Household income			.298	.165	.158
Cohort			−.178	.859	−.017
Asian nationality			−.160	.985	−.014

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

for increasing academic performance. The following analysis of our qualitative data explores potential reasons for this finding.

Multi-site case study

Interview data from the multi-site case study of five IBDP schools in China expanded and deepened the findings of our online survey. This section of the paper outlines the core findings with a focus on the drivers of private supplementary tutoring followed by illustrating the views of administrators, students, and teachers about private supplementary tutoring.

Drivers of private supplementary tutoring The interviewees in all five IBDP schools recognised that some IBDP students did participate in private supplementary tutoring and shared their views about the motivations of students. Central in this regard was a perception of highly competitive academic environments in conjunction with the academic rigor of the IBDP. In other words, the IBDP schools were all relatively high-achieving academically, which was described as contributing to expectations among parents and students about high scores in assessments for admission to prestigious universities worldwide. As one teacher described, "The competition they experience and their parent perceive about getting them into the right universities drives them to go to tuition after school." (School 1, Teacher 3). A notable finding of the quantitative data analysis was a negative association between participation in private supplementary tutoring and final IBDP scores. As a potential reason, interviewees in all five schools noted that private supplementary tutoring was mainly used for remedial purposes. As one teacher described, "It's the poorer students getting the tutoring" (School 3, Teacher 2). Further, it was also noted that participation was often a means for low

achieving students to catch up with their peers. As a school coordinator and student noted, "So it's more remedial, to catch up" (School 3, Coordinator), and, "I had a tutor for a little while just to catch up, but after that I stopped" (School 2, Student 4).

Subjects of private supplementary tutoring The interviewees also illuminated a clear subject divide with regards to private supplementary tutoring. Interviewees in the five schools reported that tutoring was most relevant to mathematics and language (both English and Mandarin).[10] This was expressed by a teacher, "It seems to be more the base things like maths, English, and languages where most of the tutors are being used" (School 5). To illuminate potential reasons for this, it was perceived that mathematics and languages involved standardised content regardless of the particular programme. As was illustrated by an IBDP student, "The most popular would be maths and Chinese mainly because with those subjects the content would be the same for every curriculum." (School 1, Student 2).

Further, the demand for private supplementary tutoring in language subjects was believed to reflect the English-medium-of-instruction of the schools. International IBDP schools in China generally consist of a diverse student body with a wide range of linguistic backgrounds (Wright and Lee 2014a). As a coordinator expressed, for those who do not have English as a mother-tongue language, private supplementary tutoring is often viewed as beneficial:

> In terms of tutoring, yes, especially with languages, as we have a lot of students where English is their second language. And if you were taking a science, for example, there's a lot of new vocabulary, terminology, and concepts. (School 3, Coordinator)

Negative perceptions of private supplementary The majority of administrator and teacher interviewees across the five schools reported actively discouraging students from private supplementary tutoring. In particular, it was contended in four schools that the strategies offered by private supplementary tutoring practitioners were not appropriate for IBDP assessments. The interviewees frequently reinforced claims by the IB that the programme assesses analytical skills, evaluation, and creativity rather than a capacity to memorise content. Specifically, it was noted that most private supplementary tutoring provisions were aimed at rote learning for the mainstream education system in China. As two interviewees argued, "The different curriculums are assessed in a very different way" (School 4, Teacher 1), and, "The big difference is that the IB teaches kids to think, not to memorise facts" (School 1, Coordinator). Similarly, teachers and administrators in four schools were sceptical that private supplementary tutoring practitioners would have sufficient specialised knowledge of IBDP assessments and recommended struggling students to seek help from IB teachers and school counsellors. As was expressed by one teacher, participation was not deemed to be effective in terms of improving academic outcomes:

> At first I think private tutoring does not work for the IB program because the content and content-type is far beyond any tutor's knowledge. They can't do it. My students say when they have tutors they don't even know how to tutor the kids how to cope with the IB programme. (School 5, Teacher 3)

Moreover, it was reported in five schools that irrespective of potential benefits from private supplementary tutoring for results in assessments, such practices were "against" the educational philosophy of the IB. Instead, the interviewees argued that the purpose of the programme is about promoting "higher thinking skills" and "whole person education" which

[10] A requirement of the IBDP is that students learn an additional language by taking at least one modern or classical language course (IB 2016e).

were believed to stand students in good stead for success in higher education and their future careers. As a teacher stated:

> Actually tutoring is to improve examination skills but not thinking skills. So private tutoring, actually for me, just doesn't work. It is against the IB programme, because we are teaching kids higher thinking skills. (School 5, Teacher 4)

Potential benefits of private supplementary tutoring Despite negative views among most of the administrator and teacher interviewees, a minority of teachers at two schools reported positive perceptions of private supplementary tutoring. In the large part, this was due to the perceived benefits for students in remedial terms. Put another way, it was noted that participation could help students who were struggling with IBDP programme content. This view is outlined in the following quotation:

> I've recommended tutors for some of my kids because they just missed some skills earlier on and they can't process it. So it is usually just filling in the blanks for kids who need training for participating in the IB. It has been really successful actually. But I'm in touch with the tutor too, so we confer. (School 2, Teacher 2)

Furthermore, in contrast to the dominant view that private supplementary tutoring is not relevant to the IBDP, teachers at two schools noted that they are aware of specialised IBDP tutors who are familiar with the programme and assessments:

> There are a few tutors who have been teaching international students Higher Level Maths for a long time so they are familiar with the IBDP; they know the objectives, they have seen all the past questions, and they basically know how to teach it. (School 2, Teacher 1)

Discussion: the IBDP and private supplementary tutoring

To date, literature on private supplementary tutoring has not fully explored the context of international educational programmes such as the IBDP. Our research of IBDP international schools in China therefore represents a timely addition to this body of research, especially given the rapid growth of these schools in recent years. Based on our findings, below we discuss participation in private supplementary tutoring among IBDP students and the association of private supplementary tutoring with IBDP scores.

The students of IBDP schools in China are a relatively discrete group defined by high socio-economic status, concentration in urban areas, and competitive academic environments. Following the existing literature, it might be expected that many of the IBDP students would participate in private supplementary tutoring. For example, research has generally demonstrated that students from high socio-economic families in urban areas have a greater propensity to engage in private supplementary tutoring relative to their less well-off and rural counterparts (see Bray and Lykins 2012, p. 12; Tansel 2013; UNESCO 2014, p. 271).

Corresponding with these research findings, we identified that private supplementary tutoring was present at IBDP schools in China in both our online survey and multi-site case study. Specifically, survey findings showed that almost one-quarter (23.8%) of respondents had experience of private supplementary tutoring during their IBDP studies, while participation was recognised by IBDP administrator, teacher, and student interviewees across the five case study schools. Further illustrative of private supplementary tutoring for the IB are growing numbers of private supplementary tutoring centres which specifically target IBDP students

across major cities in China (see http://www.focusedu.cn/ib/). Nonetheless, our survey data implies that participation levels are lower than has been identified in research of private supplementary tutoring for China's national educational system; prior studies have demonstrated participation rates of above 50% among various groups of students (see Peking University 2006; Shen 2008; W Zhang 2014). It remains to be researched how participation rates of IBDP students in China compare with IBDP students in other contexts.

Interview data from our case study schools illuminated perceptions about potential reasons for relatively low participation rates among IBDP students. In particular, the majority of administrators and teachers had a strong perception that (1) the IBDP assesses higher-order thinking skills, which cannot be nurtured through the rote approaches of private supplementary tutoring and (2) private supplementary tutoring practitioners would not have the sufficient knowledge of IBDP subject content or assessments. As a result, it was frequently reported that private supplementary tutoring is not beneficial for the IBDP and that students should instead seek support from IBDP teachers and school counsellors. Given the ample education resources of the case study schools (i.e., annual average tuition fees of US$33,000), it seems unlikely that IBDP students would be driven to engage in private supplementary tutoring to compensate for a lack of school provisions. It is also noteworthy that private supplementary tutoring was deemed to be a "problem" by many of the administrator and teacher interviewees. Specifically, it was commonly noted that participation was in conflict with the "whole person" educational philosophy of the IB. Indeed, it is questionable whether IBDP students could fulfil objectives of becoming, for example, open-minded, caring, risk-takers, or balanced, through participation in private supplementary tutoring, especially types aimed at test preparation.

A theme emerging from the interviews was that IBDP students often engaged in private supplementary tutoring for mathematics courses and to improve language proficiency, which resonates with prior research (Berberoğlu and Tansel 2014; Bray and Lykins 2012, p. 13). The interviewees noted that, unlike some other aspects of the IBDP programme, mathematics and languages (English and Mandarin) have relatively standardised content and student learning could, therefore, be enhanced through non-IB specific approaches offered by private supplementary tutoring practitioners. In addition, the popularity of private supplementary tutoring for language proficiency was thought to stem from the diverse linguistic backgrounds of students and the English medium-of-instruction at IBDP schools in China.

The online survey identified factors associated with IBDP scores. Mother's educational attainment and household family income were positively associated with IBDP scores, which is in close alignment with extensive prior research on the role of family background characteristics on educational attainment more generally (e.g., see Shavit and Blossfeld 1993 for a review of 13 countries). The finding of a greater significance of mother's education, above father's education, for the educational attainment of students has also been established in the literature (Buis 2013; Harding et al. 2015; Korupp et al. 2002). This may stem from children spending more time with their mother, especially during early years of childhood, and subsequently the relatively greater role of mother's education in facilitating cognitive development and guiding educational choices (Erola et al. 2016, p. 35).

Most importantly for the focus of this paper, our survey found a negative association between participation in private supplementary tutoring and final IBDP scores. Interview data from our multi-site case study shed light on possible reasons. First, it was reported by IBDP administrators, teachers, and students that the majority of students who engage in private supplementary tutoring do so for *remedial* purposes, rather than being an activity for all students (cf. Hartmann 2013). In other words, a potential factor contributing to the negative association was that the IBDP students who participated in private supplementary tutoring

were more likely to be struggling with course content and, therefore, were more likely to obtain lower final IBDP scores. In particular, interviewees described that students sought private supplementary tutoring to "catch up" due to the academic rigor and the English-medium-of-instruction of IBDP schools. Such pressure for weaker students to participate in private supplementary tutoring is arguably intensified given interviewee descriptions of highly competitive academic environments at IBDP international schools in China.

Secondly, there was a strong belief among teachers and administrators that private supplementary tutoring was not conducive to the unique educational approach of the IBDP. Most administrators and teachers actively discouraged participation, which stands in contrast to research in non-IB contexts (Tansel 2013, p. 23). Above all, participants maintained that IBDP assessments focus on "higher thinking skills" which cannot be rote-learned via private supplementary tutoring and are beyond the knowledge-base of private supplementary tutoring practitioners. Following this, participation in private supplementary tutoring was viewed by participants as ineffective for the IBDP and, therefore, contributing to lower final IBDP scores. However, we note that this latter point is a "pro-IB" interpretation and further research is required on the effectiveness of private supplementary tutoring for IBDP assessments before a definitive conclusion can be made. Indeed, it is noteworthy that a minority of the teachers reported being aware of private supplementary tutors with a successful track-record of supporting IBDP students.

Concluding remarks: private supplementary tutoring at international schools

Before concluding the paper, we wish to note several limitations in our data. Due to voluntary participation and the sample size, our study is not representative of all IBDP schools and students across China. First, quantitative data analysis of the 151 participants from 14 IBDP schools in the online survey can only be indicative of private supplementary tutoring among IBDP students in China. We also note that our quantitative analysis did not control for the endogeneity of private supplementary tutoring, such as the impact of parental preferences and student motivation for high academic performance (see Dang and Rogers 2008). Second, the multi-site case study schools were all located in Beijing or Shanghai and were elite in terms of academic performance and tuition fees. Other IBDP schools and other IBDP students in China may yield alternative findings.

Nevertheless, as an exploratory study, our findings provide a first insight into private supplementary tutoring among IBDP students at international schools in China. The lack of prior research is perhaps unsurprising given that such resource rich schools are generally defined by favourable staff–student ratios, highly trained teachers, and first-rate facilities (Wright and Lee 2014a, b). In other words, students at such schools may see limited need for supplementary education given that once "you are on board, you have just about the best of everything" (McCarthy and Kenway 2014, p. 169). Despite this, in the context of a massification of higher education globally, there is intensified competition for admission to the world's most prestigious universities (Marginson 2016). It is arguable, therefore, that students at international schools may be motivated to participate in private supplementary tutoring to gain an edge in highly competitive university admission processes, which would align with findings of research in non-international schooling contexts (Smyth 2009; Tansel and Bircan 2005).

Moreover, in the context of China, the majority of students enrolled at international schools offering the IBDP are from high socio-economic groups. Three-fifths (59.6%) of respondents to our online survey indicated an annual family household income in excess of US$80,000 and the average yearly tuition fee across our five case-study schools was US$33,000, set against a gross national income per capita in China of US$7930 in 2015 (World Bank 2017). Findings from our quantitative and qualitative analysis demonstrate that these students *do* seek private supplementary tutoring to supplement their IBDP studies. Our multi-site case study illuminated a perception among administrators, teachers, and students that this was most commonly for remedial purposes for mathematics and languages. We note, therefore, that private supplementary tutoring could be understood as a means to which families can intervene to support students perceived as under-performing in the IBDP in the context of highly competitive academic environments.

Finally, to build on our research, we call for further investigations to explore participation in private supplementary tutoring among IBDP students in different contexts in China and other parts of the world. This could include contrasting participation at international schools with other contexts such as the United States where 90% of IB schools operate in the public schooling sector (IB 2016b). In addition, future research could investigate a sub-group of private supplementary tutoring practitioners specialising in the IBDP that a minority of our interviewees noted as having specialised knowledge of IBDP assessments to identify the participants, teaching methods, and effectiveness of their practices. Such further research will be important to build on our exploratory study and to provide a fuller picture of private supplementary tutoring for the IBDP.

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