



Measuring the multilingual reality: lessons from classrooms in Delhi and Hyderabad

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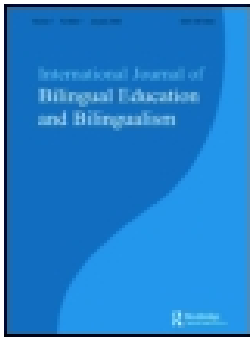
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Measuring the multilingual reality: lessons from classrooms in Delhi and Hyderabad

Amy Lightfoot^a, Anusha Balasubramanian^b, Ianthi Tsimpli^b, Lina Mukhopadhyay^c and Jeanine Treffers-Daller^d

^aBritish Council, Colombo, Sri Lanka; ^bUniversity of Cambridge, Cambridge, UK; ^cEnglish and Foreign Languages University Hyderabad, Hyderabad, India; ^dUniversity of Reading, Reading, UK

ABSTRACT

India's linguistic diversity is reflected in classrooms across the country, where multiple languages are used by teachers and learners to negotiate meaning and instruction – a multilingual, multicultural student body is the norm, whether in urban or rural contexts. This study documents teaching practices in English language and maths lessons in Delhi and Hyderabad, with a specific focus on language use. The findings from 104 classroom observations allow us to profile multilingual practices used in schools with different official mediums of instruction. Results reveal a predominant use of 'language mixing' in the classroom, in both English- and regional language-medium of instruction contexts – especially in English subject lessons. Maths lessons in regional-medium schools did not involve as much language mixing by the teachers but this was still a strong feature for learners. The data also shows differences between language use particularly when comparing English-medium schools in each city. Specifically, lessons in Delhi were characterised by absolutely no occurrences of English used on its own by the teachers (as recorded during five-minute intervals), compared to significantly greater use of English alone in Hyderabad English-medium and Telugu-medium schools. Delhi teachers appear to use a greater amount of language mixing during each lesson.

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Multilingual education; classroom; teachers; India; translanguaging; code-switching

1. Introduction

India is among the most linguistically diverse countries in the world according to the Linguistic Diversity Index reported by UNESCO (2009). There are 22 languages recognised by the constitution and 121 languages spoken by more than 10,000 people, according to the 2001 census data (Government of India 2001). This multilingual diversity presents an extraordinary cultural resource with both opportunities and challenges resulting for the already highly complex education system, given the huge population and often scarce resources. Choices about language of instruction are at the forefront of current discussions about education, complicated by perceptions of the increasing importance of English to link people within India and internationally. The new National Education Policy (Ministry of Education 2020) includes much greater emphasis on languages in education than ever before.

Legally, the medium of instruction to be offered by state government education should be the child's mother tongue, particularly at primary school (Ministry of Law and Justice 2009).

CONTACT Amy Lightfoot  amy.lightfoot@britishcouncil.org

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Equally, the new National Education Policy explicitly states the advantages of children learning in their mother tongue until Grade 5 (age 10) (p.13). However, there is a tacit recognition of the lack of resources available to realise such ambitions, with only the 22 languages recognised by the constitution receiving official financial support from the central government. Those seeking to establish a school that offers education in a minority language therefore often rely on funding from trusts, foundations or individuals (including fees raised from the students themselves). One study from 2011 calculated that there are just 31 mediums of instruction in use across the country, reduced from over 67 in the 1970s (Meganathan 2011) – a small proportion of the total number of languages in active use in cities, towns, villages and homes.

Nevertheless, despite the low number of languages offered as official medium of instruction, there is no doubt that the majority of classrooms across the country involve a multilingual student body. As a result, multilingual practices are adopted almost without exception – ‘knowingly or unknowingly’ (Meganathan 2018, 6). Language diversity within schools has increased particularly within urban contexts in recent decades, due to internal migration. In some cities, including Delhi, schools have been established to cater to the influx of children from other parts of India – there are Kannada medium schools for those from Karnataka, Gujarati for those from Gujarat, Telugu for migrant families from Andhra Pradesh or Telangana, and many more. However, linguistic groups are not at all neatly demarcated within or across schools – a multilingual, multicultural student body is very much the norm, whether in urban, semi-urban or rural contexts.

Despite recognition of the fact that multilingual student populations predominate (Mohanty 2010), there has been relatively little peer-reviewed research conducted into the use of different languages in classrooms in India, the interplay that this might have with different types of teaching practices or the effect that patterns of language usage may have on student learning. The current paper fills an important gap in the available knowledge on the use of different languages in a variety of school types in India, taking a macrolinguistic perspective on language use in the classroom. Most studies on translanguaging (Li Wei 2017) and code-switching provide detailed analyses of small data sets in one specific context. Our study is novel in that it provides a comparative analysis of 104 classroom observations in 27 schools in two different locations in India, and thus contributes to a much-needed overview of the variability in teaching practices with regard to the choice of languages in classrooms.

1.1. Policies around languages in education

Perhaps the most frequently cited attempt to manage language in education in India is the three-language formula. This was originally proposed in 1956 and stipulated that secondary-level pupils should be taught in the official state language or – if available – their mother tongue, followed by English and Hindi or another regional language. However, there is broad recognition that the implementation has been inconsistent at best (NCERT 2006) and non-existent at worst (Petrovic and Majumdar 2010; Chand 2011).

The new National Education Policy (NEP) released in July 2020, clearly acknowledges the benefit of mother-tongue based instruction. It states that

wherever possible, the medium of instruction until at least Grade 5, but preferably till Grade 8 and beyond, will be the home language/mother tongue/local language/regional language. Thereafter, the home/local language shall continue to be taught as a language wherever possible.

The policy goes further than other previous documentation in stating that this approach ‘will be followed by both public and private schools’ (MoE 2020, 13). The policy also promotes the use of multiple languages in the classroom, highlighting multilingualism as an objective of school curriculum and pedagogy. This is in line with what some researchers have termed ‘the multilingual turn,’

referring to a growing awareness of the value of and need for a multilingual focus in education (Sembiante 2016).

However, while the policy recognises the opportunity that multilingualism provides and its value, it does not explicitly address the challenge that many teachers face – particularly in urban contexts – where there are multiple home languages represented in the classroom coupled with a lack of training on how best to leverage these ‘funds of knowledge’ (Moll et al. 1992) or scaffold learning of new language skills. In addition, while the policy highlights the intention to recruit teachers from across the country to meet the language needs of students in different locations, it does not explain how this will be managed given the existing shortfall in teachers in most states. The policy also does not highlight the importance of developing higher order literacy skills, including reading comprehension, in the child’s strongest language(s).

The penultimate draft of the policy questioned the increasing focus on English by many state education systems, but highlighted that ‘English must be available and taught in a high-quality manner at all government and non-government schools’ in order to eliminate the divide between the higher and lower socioeconomic groups (MHRD 2019, 82). In the final draft (MoE 2020), references to the importance of English have been downplayed although it is listed as an additional subject to be taught alongside state languages. There thus appears to be a reluctant acceptance at the national level of the need for English but a strong desire for a resurrection of (other) Indian languages in education and wider society. This is perhaps at odds with current practices at the state level, where decision-making around education is largely made. Andhra Pradesh, Telangana, Karnataka, Punjab and West Bengal have all recently committed to increasing English-medium instruction in their government schools (Rao 2019; The Telegraph 2019; D’Souza 2019; Aman 2018; Hindustan Times 2018). The new National Education Policy appears to be advocating a move to the teaching of English as a subject (instead of schooling where English is the medium of instruction across the curriculum). It states, ‘all languages will be taught with high quality to all students; a language does not need to be the medium of instruction for it to be taught and learned well’ (13). This more closely aligns with the recommendations made in the literature, based on research findings (Simpson 2017).

These developments in national policy are very promising, but because education remains a concurrent subject in India (some oversight from the national government but largely devolved to the state level) (Anderson and Lightfoot 2018), changes in practice may be slow to happen. Soon after the release of the final National Education Policy, there has been considerable reluctance reported in the media of private schools and states where English medium has been implemented from Class I adhering to the mother tongue until Grade 5 recommendations (e.g. IANS 2020).

1.2. Evidence relating to language in education

A strong and growing evidence base outlines three areas of considerable benefit for children being educated in their mother tongue, particularly at the primary level. *The first area is comprehension.* Children learn best in the language they know best. So, if a child starts school and is taught in the language that he or she uses at home, they are more likely to learn and develop skills and knowledge in each subject. There is a significant amount of research evidence from sub-Saharan Africa to show that children who study at primary level in their home language for at least six to eight years have better learning outcomes than those who do not (Ouane and Glanz 2010; Romaine 2010).

The second area of value relates to identity. Attending a school where your own language is not used or does not appear to be valued can have a negative effect on a child’s identity and sense of place in the world. Parents can also begin to question the value of their own language and insist that children learn in a different one (for example, English). This can result in children not having a strong connection to their culture and background. It can also result in children feeling that their parents (speakers of their home language) have a lower standing in the community because they do not use the dominant method of communication (Spolsky 2009; Sah 2020).

Closely related to the above is *the need for recognition of diversity and cultural preservation*. Reducing the number of languages used as mediums of instruction can eventually result in language death and the disappearance of their corresponding cultures (Skutnabb-Kangas 2000). As Durairajan writes, ‘when the first/home/ more enabled language is not just not used, but discouraged and prohibited in the English classroom, the message that goes out is that this capability in this language is not valued’ (2018, 281).

Children who are forced to learn in a language that is not their own are disadvantaged compared to those who learn in their mother tongue. It is often minority groups who cannot access mother-tongue based education, compounding existing disadvantages due to social or geographical reasons. An inaccessible language of instruction can make this worse. Mohanty (2010) refers to this as the ‘double divide.’ Bhattacharya (2013) reports from her ethnographic study of schools on the outskirts of Delhi that children studying in a low-cost school claiming to teach through the medium of English have clearly been disadvantaged in their learning. This is both in terms of their ability to use language and their understanding of subject content.

It is important to note at this point that this evidence does not preclude the introduction of a second or even third language *as a subject*, but suggests the emphasis should be on the mother tongue for delivery of content in other aspects of the curriculum for any benefits of this approach to hold.

1.3. The multilingual medium of instruction reality

Despite the evidence highlighting its importance and their constitutional rights, only a small proportion of children in India currently receive education in their mother tongue (Jhingran 2019) due to a variety of reasons including the scarcity of resources, a lack of trained teachers, and perceptions among parents and some educators of the need for children to be schooled entirely in a socially high-value language to increase their proficiency in that language and therefore their life chances (i.e. buying into the fallacy that a more and earlier approach’ is better) (Sayer 2015; cited in Sah 2020). In most schools that purport to offer education in a particular language medium that is not the home language of the majority of the students or the teachers, the reality is that the level of exposure to this target language may be very minimal (Dearden 2014; Erling et al. 2016, Treffers-Daller et al. (submitted)).

Unfortunately, this reality is coupled with multiple reports of teachers feeling considerable guilt at not being able to sustain a lesson using only the official medium of instruction (Coleman 2017) – despite the growing body of evidence that shows that learning in a language that is not one’s own is less than ideal, as discussed above. Chimirala (2017) laments the ‘monolingual mindset’ that continues to permeate the educational contexts in India where she has undertaken research involving a survey of over 270 teachers and 40 interviews. She reports that while teachers recognise the need to scaffold learning by using more familiar languages, they suffer from ‘conflicting discourses’ which can lead to at best feelings of guilt and at worst a total ban on learners’ using their home languages in the classroom.

Anderson and Lightfoot’s (2018) survey of 168 English subject teachers revealed similar attitudes, including some ongoing disdain for the use of translanguaging practices in the classroom by either the teachers themselves or their learners. More than a third of the respondents (36%) indicated that languages other than the official medium of instruction are discouraged at their school, with nearly a fifth (18%) reporting that they had specifically been told to only use English in their English language classrooms. Meanwhile, Durairajan (2009; cited in Durairajan 2018) reports the use of physical punishment for the use of a language in the classroom that was not the formal language of instruction (meaning English).

Nag (2017) and Panda and Mohanty (2009) strongly advocate for a social justice approach to multilingualism and multilingual education. They have sought to broaden the definition of multilingual education away from the surface-level characterisation of the use of two or more

languages in education, to the development of multilingualism being an integral part of the end goal of schooling. This therefore stretches the implementation of mother tongue-based multilingual education away from a focus on facilitating the transition between home and more dominant languages, and towards a more inclusive model which has an additional aim of strengthening the learners' mother tongues which in turn enriches and supports their learning across the curriculum (Nag 2017).

Nevertheless, effective implementation of mother-tongue based and/or multilingual education is clearly not straightforward and requires attitudes, beliefs, knowledge and skills to be aligned. This is true for all actors participating within the education system including policy makers, administrators, teachers, head teachers, parents and the students themselves. While the focus of this research paper is predominantly on teacher practices, it is acknowledged that these operate within a much broader and interconnected system.

2. The context of the current study

While there have been a number of studies which have sought to tease out the attitudes, beliefs and practices of teachers in India with regard to language use in the classroom, including those described above, the evidence base is still relatively small. In particular, there are few studies which have sought to systematically record this language use – the area that the current study aims to explore.

The Multilingualism and Multiliteracy (MultiLila) project¹ (Tsimpli et al. 2019, 2020) aims to increase awareness and knowledge about both languages of instruction, learning levels and cognitive abilities of the multilingual children in India. The project is a four-year longitudinal study, beginning in 2016, and operates across three research sites: Delhi, Hyderabad (in Telangana state) and Patna (in Bihar). In addition to administering a series of language, numeracy and cognitive tasks to the children, the project also involves observations of lessons in the schools these children attend. Broadly, these observations seek to explore what languages are being used by the teacher and the learners, at what stages during the lesson and accompanying what types of activities.

This paper aims to identify patterns in the frequency of language use in the different contexts observed. Specifically, we aimed to look at whether or not teachers and learners use more or less language mixing according to (a) the subject being taught and (b) the official medium of instruction of the school.

We choose to use the term 'language mixing' to describe the act of multiple language use within the intervals that we observed within the lesson. Because of the macro perspective adopted in the present study it is difficult to decide whether the use of different languages is an instance of translanguaging or code-switching and, in any case, the distinction is beyond the scope of this paper. While it is possible that in some of the lessons teachers and learners practice translanguaging, for the purposes of the current paper we do not analyse 'the creative and critical dimensions of [...] expressions' nor adopt an approach to translanguaging according to which 'a fuller description and interpretation must involve an understanding of the sociopolitical context in which these expressions occur' (Wei 2017, 13). However, what is of interest here is to initially try to simply quantify the different input that the learners experience in terms of languages used by the teacher, and their own output, to be better able to describe the multilingual reality of these classrooms in Delhi and Hyderabad.

Using the term 'language mixing' here includes both what have been termed as 'code-switching' (that is switching between utterances or at major clause boundaries within a sentence) and 'code-mixing' (insertion of elements of one language into another within one sentence) – see Muysken (2000) for further details. A detailed analysis of where exactly the switch takes place (e.g. within or between utterances) and/or discussion on the features of each individual's idiolect which

informs this language use are beyond the scope of the current investigation, as this paper takes a macro-linguistic perspective on the frequency of usage of different languages for pedagogical purposes.

The research questions we seek to address in the study are:

- (1) What do classroom observations from Delhi and Hyderabad reveal about languages of instruction and communication of teachers and learners in English and maths classrooms?
- (2) Are there differences in classroom language use between Delhi and Hyderabad?
- (3) Is there a link between languages used per preferred activity in the classrooms observed?

2.1. Methods

2.1.1. Materials

A classroom observation tool was designed as a part of the MultiLila project to observe the classroom environment during lessons, using scales with indicators. These scales document a wide array of practices and multilingual approaches used in the classroom at the time of the observation. The tool consists of five sections: (1) Teaching environment; (2) Observation of teacher activity and child response; (3) Teaching content and strategies; (4) Teaching practice and (5) Record of good practices.

The results presented in this paper focus on Section 2 of the observation tool which documents what languages the teacher and students are using along with the activities undertaken. Both were recorded at five-minute intervals during each 30-minute observation.

2.1.2. Sample

The data was collected from a total of 27 government schools across two sites – New Delhi, India's capital, and in Hyderabad – the capital of the state of Telangana in southern India. The children were from underprivileged backgrounds and from low-SES families residing in urban slum and non-slum areas and were attending government schools with relatively low funding and resources (Tsimpli et al. 2019, 2020).² Hindi is the majority language in Delhi and Telugu in Hyderabad. A random selection of government schools in the slum and non-slum areas was carried out and only schools willing to participate were included.

This paper explores data collected from both the locations at two different time points, from 2017 to 2018. The Delhi sample includes both Hindi and English-medium schools, while the Hyderabad data involves classes taking place in Telugu and English-medium schools. Collecting data at these two linguistically and geographically distinct sites allows us to compare classroom practices where learners have different language profiles, with distinct regional languages used in the school, community and at home.

A total of 66 teachers completed a questionnaire – We collected information on teachers' language history – specifically on language/s used by teachers at home (home languages), other languages teachers knew (from school or the community) and the medium of instruction of the school/s the teachers attended as students. All the teachers in both cities mentioned English as one of the languages they know, but in some cases teachers reported other languages in addition to their home language and English (in Hyderabad). It is important to note that we did not ask them to indicate their level of proficiency in each language, including English, but only whether they were 'able to speak' and/or 'able to write' in these languages.

In Delhi, 75% of the teachers reported Hindi as their main home language, 12.5% indicated Haryanvi and the remaining 12.5% stated Punjabi as their home language. In Hyderabad, 90% of the teachers reported Telugu as their home language, with 6% and 4% stating Urdu Kannada respectively. The teachers were also asked to indicate the medium of instruction they experienced as

students themselves. Only 19% of teachers in Delhi attended school where English was the medium of instruction, compared to a much higher 58% of teachers in Hyderabad ($p < 0.001$, Fisher's exact test).

We also collected information on children's language usage at home using the child questionnaire (developed as part of the MultiLiLa project), which was adapted and enriched to suit the Indian context from Kaltsa, Prentza, and Tsimpli (2019) and Rothou and Tsimpli (2017). Children were specifically asked which languages their parents, siblings, relatives and best friends use while interacting with the child and in which language/s the child responds. Out of the total sample ($n = 832$ of participating children from both cities – this is a subset of the total number of children in the 104 lessons that were observed), 295 children (80%) had Hindi as their home language in Delhi and the remaining 76 children (20%) had other languages at home such as Bhojpuri, Bihari, Rajasthani, Haryanvi, Pahari and Punjabi. In Hyderabad, 322 children (70%) had Telugu as their home language and 139 children (30%) had home languages such as Hindi (10%), Lambadi (8%), Marathi (4%), Urdu (3%), Kannada (3%) and others (2%). None of the children reported speaking English at home.

Our sample of 104 classroom observations was conducted in language and mathematics classes in Grades 4 and 5 in a total of 27 government schools distributed across the two cities. We chose to observe English and maths subject classes for a number of reasons. First, because these are both core subjects within the curriculum. Second, because measuring language use in the English language class would be particularly informative as this is the lesson in which we would expect the highest use of English even among lessons in an English-medium school. In contrast, a Maths class would shift the focus away from language and onto content, in which case we would hope to be able to observe a more natural use of language(s) in both English-medium and regional language schools. Third, we expected that the comparison between the two subjects in the two mediums of instruction would show differences towards the official medium of instruction in each case.

The sample included two (7.5%) Hindi medium and five (18.5%) English medium schools in Delhi, and thirteen (48%) Telugu medium and seven (26%) English medium schools in Hyderabad. The distribution of the classroom observations from these schools is presented in Table 1. While the data was collected at two different time points in each city, it is combined for each location for the purposes of the present analysis.

The discrepancy in the number of observations in the two sites stems from the size of the schools. We aimed at 400 child participants from each site for the learner assessments undertaken as part of the wider study – this is a subset of the total number of children in the lessons we observed. In Delhi, schools were considerably larger in size, hence a smaller number of schools were involved compared to Hyderabad. Average class sizes were 32 students.

2.1.3. Procedure

Data was collected during classroom observations of language and mathematics classes by trained research assistants (RA). In both Hyderabad and Delhi, the language classes observed were targeting learning of English as a subject – this was true for all schools, regardless of their official medium of instruction. The RA was seated at the back of the classroom or at a point where he/she could have a good view of the entire class without disturbing the students.

Table 1. Distribution of classroom observations across the two cities and types of schools.

Subject	Delhi		Hyderabad		Total
	Hindi medium schools ($n = 2$)	English medium schools ($n = 5$)	Telugu medium schools ($n = 13$)	English medium schools ($n = 7$)	
English	4	8	26	14	52
Mathematics	4	8	26	14	52
Total	8	16	52	28	104

The teachers ($n = 64$) were aware of the purpose of these observations. The RA was directed to identify the various teaching resources made available for the lesson, the teaching environment and also complete the sections of the tool where they documented the instances of each language used by the teacher as well as the students during a 30-minute period of a 45-60-minute lesson, along with the types of activity undertaken.

2.1.4. Analyses

The RAs were asked to indicate on the observation tool any language used within each five-minute period – whether the language was used for a single word, a complete turn, alone or in combination with others. This meant that in some five minute intervals, only one language would be recorded – if the teacher used that language alone with no words spoken or written on the board in any other language – while in others two or more would be recorded as s/he mixed languages while instructing the students or modelling the target language. The occurrence of these languages was coded according to whether they were using only English, only the regional language, or language mixing. In Delhi, language mixing involved the use of English and Hindi or Hindi and Urdu while language mixing in Hyderabad schools involved the concurrent use of English and Telugu, Hindi, Telugu and English, and Hindi and Telugu.

The occurrence of each language use or language mixing was added for all time intervals which gives us the total duration of occurrence of a particular language over a 30-minute lesson. We also computed the percentage of such occurrences in the 30-minute lessons according to the total number of language use recordings across the lessons.

This procedure was followed to analyse both English and maths classes across the two sites. Thereafter, the findings from the two sites were analysed for the following comparisons: (a) teacher vs. learner language use in language and maths classes, (b) teacher vs. learner language use in regional language vs. English as medium of instruction (Mol).

3. Results

3.1. Language practices in Hindi- vs. English-medium of instruction schools in Delhi

A key result is that in Delhi, there were no five-minute periods during either the English subject classes or math classes where English was used on its own by the teachers. Instead, teachers preferred language mixing (62.5% and 77.08% of total language use in Hindi-medium and English-medium schools respectively) or the use of Hindi alone (37.5% and 22.91%). In contrast, the learners in Hindi-medium schools, used a larger proportion of Hindi on its own (77.08% and 50% of the language use in Hindi and English-medium schools respectively) followed by 12.5% and 36.45% involving language mixing in Hindi and English-medium schools and a very minimal occurrence of English being used alone (2.08% and 7.29% in Hindi and English-medium schools respectively).

The percentage of Hindi used alone by teachers in English and Hindi-medium schools in Delhi was not statistically different [$\chi^2(1) = 3.26, p = 0.07, n.s.$]. There was however a statistically significant difference between learners' use of Hindi on its own, with higher use in the Hindi-medium schools vs English-medium [$\chi^2(1) = 5.7, p = 0.01^{**}, V = 0.21$]. There was also no significant difference in the teachers' use of language mixing between English- and Hindi-medium schools [$\chi^2(1) = 1.4, p = 0.23$], indicating that it is their preferred and natural way of teaching whatever the stated medium of instruction, reflecting reality outside of the classroom. In contrast, learners used significantly more language mixing in English vs. in Hindi-medium schools [$\chi^2(1) = 11.52, p < 0.01^{**}, V = 0.48$].

Table 2 presents the use of different languages by teachers and learners in maths and English language classrooms across regional medium and English-medium schools in Delhi.

For the mathematics classes in English-medium schools in Delhi, teachers rendered the lessons by mainly using language mixing (88% of the language use), with the remaining 12% involving Hindi

Table 2. Delhi schools – % (rounded) of language use in relation to total recorded during the 30-min observations.

Subject	Hindi-medium school observations (n = 8)						English-medium school observations (n = 16)									
	Teacher			Learners			Teacher			Learners						
	English only	Hindi only	Language mixing	English only	Hindi only	Language mixing	English only	Hindi only	Language mixing	English only	Hindi only	Language mixing	No language used			
Maths (n = 12)	0	50	50	0	0	25	75	0	0	12	88	0	0	48	44	8
English (n = 12)	0	25	75	0	4	79	0	17	0	33	67	0	15	52	29	4

used alone. The learners on the other hand used similar proportions of Hindi (48%) and language mixing (44%) followed by 8% of no language usage.

Conversely, for mathematics classes in Hindi-medium schools, teachers used language mixing and Hindi alone in equal measure (50%). The learners preferred to use Hindi alone (75% of the language use), with the remaining 25% involving language mixing.

For the English language classes in English-medium schools in Delhi, the teachers mostly used language mixing (67%) and Hindi alone (33%). The learners spent just over half of the time analysed using Hindi alone (52%), followed by 29% of the language use involving language mixing, 15% where English was used alone and 4% where no language was used.

In Delhi, there was no significant difference between teachers' use of Hindi between maths and language classes, [$\chi^2(1) = 0.64, p = 0.42, ns$]. Learners used more Hindi in language classes compared to in their math classes, [$\chi^2(1) = 5.7, p = 0.01^*, V = 0.21$]. There was no significant difference between teachers' use of language mixing between maths and language classes, [$\chi^2(1) = 0.25, p = 0.61, n.s.$] However, learners used more language mixing in maths classes compared to language classes, [$\chi^2(1) = 6.33, p = 0.01^*, V = 0.5$].

3.2. Language practices in Telugu- vs. English-medium of instruction schools in Hyderabad

In English-medium schools in Hyderabad, the teachers rendered their lessons (maths and English language classes combined) with equal proportions of language mixing (41.66%) and English used alone (42.26%), followed by 14.28% of Telugu used alone and a small proportion featuring only Hindi (0.5%). On the other hand, the analysis of learners' language usage showed 36.30% of the total language use involved language mixing; roughly equal proportions of English used alone (25%) and Telugu used alone (22.61%); 15.47% involving no language usage and 0.59% of Hindi used alone.

In Telugu-medium schools, 41.34% of the total language use across both subjects involved the teachers using a mixture of languages, 38.14% featured the use of Telugu alone and 20.19% involved the use of only English. Similar proportions of language use were evident among the learners: 39.10% Telugu only, 34.61% language mixing, 19.87% English only and 6.41% where no language was spoken.

Thus, teachers used significantly more English alone in English-medium schools compared to Telugu-medium schools, [$\chi^2(1) = 7.8, p = 0.005^{**}, V = 0.35$]. However, there was no significant difference in the learners' use of English between English and Telugu-medium schools, [$\chi^2(1) = 0.55, p = 0.45, ns$]. There was a statistically significant difference in teachers' use of Telugu across medium of instruction, [$\chi^2(1) = 11.07, p < 0.01^{**}, V = 0.46$]. The learners also showed a significant difference in the use of Telugu on its own between English and Telugu-medium schools, [$\chi^2(1) = 4.12, p = 0.04^*, V = 0.25$] (Table 3).

With respect to the maths classes in English-medium schools in Hyderabad, 48% of the total language use involved teachers using language mixing, 33% featured only English and 19% involved only Telugu. The learners also used a similar proportion of language mixing in the classroom (42% of the total language use), 30% of Telugu alone, followed by 15% where English was used on its own and 13% where no language was spoken by the learners in the classroom.

Contrary to this, in Telugu-medium schools the maths teachers used a significant proportion of Telugu on its own (60% of the total language use), language mixing for about a third (33%) and English alone for just 7%. The learners used 64% of Telugu, a mixture of languages for 22%, 8% of English on its own and 6% of recording where no language was produced.

In the English language classes in English-medium schools, the teachers used a considerable proportion of English on its own (51% of the total language usage) followed by 36% of language mixing, 10% involving Telugu on its own, and a negligible proportion of either no language spoken (2%) or Hindi alone (1%). However, the learners used less English on its own than the teachers (35% of the

total language use), 31% involved language mixing, 18% featured no language spoken, 15% involved Telugu used alone and a small proportion where Hindi was used on its own (1%).

In the English language classes in Telugu-medium schools, 49% of language mixing was observed while 33% involved use of English alone and 17% use of Telugu alone. A similar pattern of language usage was observed in the learners, with 48% of the language use involving language mixing followed by 31% of English only, 15% of Telugu only and 6% where no language was spoken.

In Hyderabad, teachers used significantly more English in language classes compared to in maths classes, [$\chi^2(1) = 10.28, p = 0.001^{**}, V = 0.42$]. Learners also used significantly more English in language compared to math classes, [$\chi^2(1) = 10.25, p = 0.001^{**}, V = 0.48$]. There was a significant difference with respect to teachers' use of Telugu between maths and language classes, [$\chi^2(1) = 16.28, p < 0.001^{**}, V = 0.52$]. The same was true for the learners as well, [$\chi^2(1) = 20.43, p < 0.001^{**}, V = 0.55$]. There was no significant difference between teacher's use of language mixing between math and language classes, [$\chi^2(1) = 0.59, p = 0.44$]. There was no significant difference with respect to the learners' use of language mixing between maths and language classes, [$\chi^2(1) = 2.8, p = 0.12$].

3.3. Delhi vs. Hyderabad

A comparison of the language use by teachers from Delhi and Hyderabad (all different mediums of instruction and subject areas combined) revealed that teachers in Delhi use a higher proportion of language mixing (72.22%) than teachers in Hyderabad (41.45%) ([$\chi^2(1) = 8.29, p = 0.003^{**}, V = 0.20$]). English was not used on its own in Delhi classes, but 27.91% of the class time was recorded as English only in Hyderabad ([$\chi^2(1) = 27.92, p = 0.001^{**}, V = 0.37$]). Hindi or Telugu alone was used in similar proportions in both sites: 27.78% of Hindi used alone in Delhi and 29.79% of Telugu alone in Hyderabad.

A comparison of language use by learners between Delhi and Hyderabad (all different mediums of instruction and subject areas combined) reveals learners in Delhi used a higher proportion of Hindi alone (59.03% of the total language use) compared to the proportion of regional language (Telugu) use on its own (33.33%) in Hyderabad ([$\chi^2(1) = 7.33, p = 0.006^{**}, V = 0.19$]). English was used alone by the learners in Delhi for just 5.55% of the total language usage. Contrary to this, a noticeably higher proportion of English was used without the involvement of other languages by learners in Hyderabad (21.66%). This difference in the usage of English on its own between learners in Delhi and

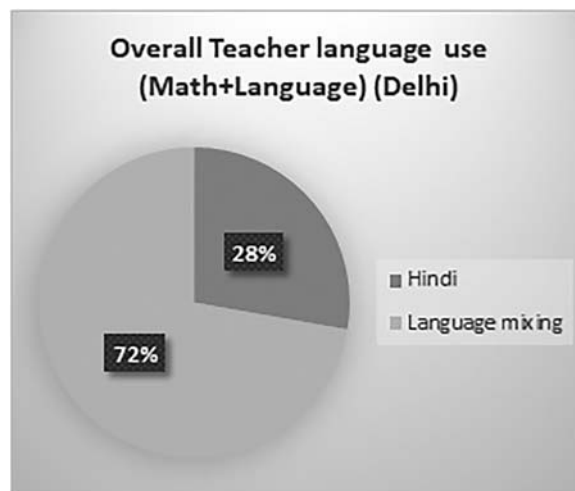


Figure 1. Overall teacher language use (Maths and language) (Delhi).

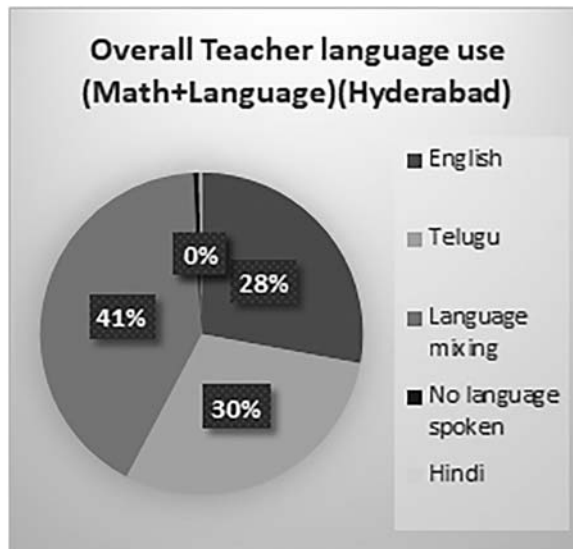


Figure 2. Overall teacher language use (Maths and language) (Hyderabad).

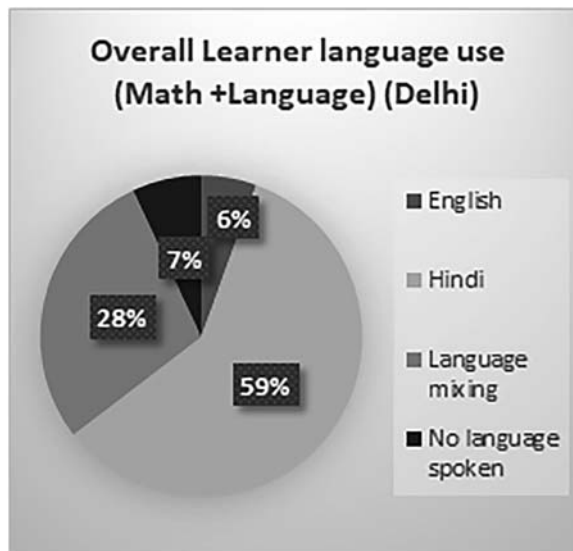


Figure 3. Overall learner language use (Maths and language) (Delhi).

Hyderabad was significant ($[\chi^2(1) = 9.48, p = 0.002^{**}, V = 0.21]$). Learners in Delhi demonstrated a similar proportion of language mixing (28.47%) as compared to learners in Hyderabad (35.20%). Figures 1–4 illustrate this data.

Our comparison of the use of English across English medium schools between Delhi and Hyderabad schools showed that teachers in English-medium schools in Delhi did not use English alone during any of the five-minute time periods, whereas in Hyderabad, data from teachers showed 42% of English only usage of the total language usage in a 30-minute period. This difference in the usage of English by teachers in English-medium schools between the two sites is statistically significant ($p < 0.001$, Fisher's exact test).

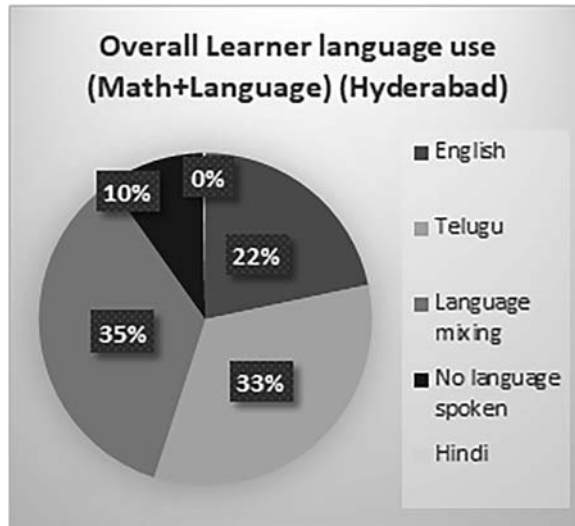


Figure 4. Overall learner language use (Maths and language) (Hyderabad).

Learners from English-medium schools in Delhi also used significantly less English only (7%) than learners from English medium schools in Hyderabad (25%) ($\chi^2(1) = 9.70, p = 0.001^{**}, V = 0.22$).

A comparison of the use of English in regional medium schools in Delhi and Hyderabad shows that there was no occurrence of English only usage during the five-minute intervals by teachers in Hindi-medium schools in Delhi – including in the English language lesson observations – while in Hyderabad, 20% of English only was observed in teacher language in Telugu-medium schools. The percentage of usage of English only by teachers in regional medium schools was significantly different between the two cities ($p = 0.0004$, Fisher’s exact test). Learners from Hindi-medium schools used English on its own for a very small proportion of the total language usage (2%) while learners from Telugu-medium schools used a higher proportion of English on its own (20%). Learners from regional medium schools showed a significant difference in the usage of English on its own between Delhi and Hyderabad ($p = 0.006$, Fisher’s exact test).

3.4. Classroom observations: activity types and choice of language

In addition to documenting the patterns of language usage during each lesson, the observers also recorded the activities undertaken by the teachers during five-minute intervals of each 30-minute period, in both the maths and English language classes. A full list of the activities that could be recorded is shown in [Table 4](#).

Observers could record more than one activity type for each five-minute period if more than one took place and they noted if the activity was carried out in English, the regional language (Hindi or Telugu) or a mix of languages. The percentage contribution of each activity was averaged across the

Table 4. Activity types recorded during the lessons.

Reading aloud	Giving oral feedback
Verbal instruction	Experimentation
Telling a story	Marking papers / work completed
Writing on the board	Taking dictation
Demonstrating	Off-task
Asking questions	Classroom management / discipline
Showing / talking about audio/video	Reviewing or summarising previous lesson
Maths exercises	Other
Problem solving exercises	

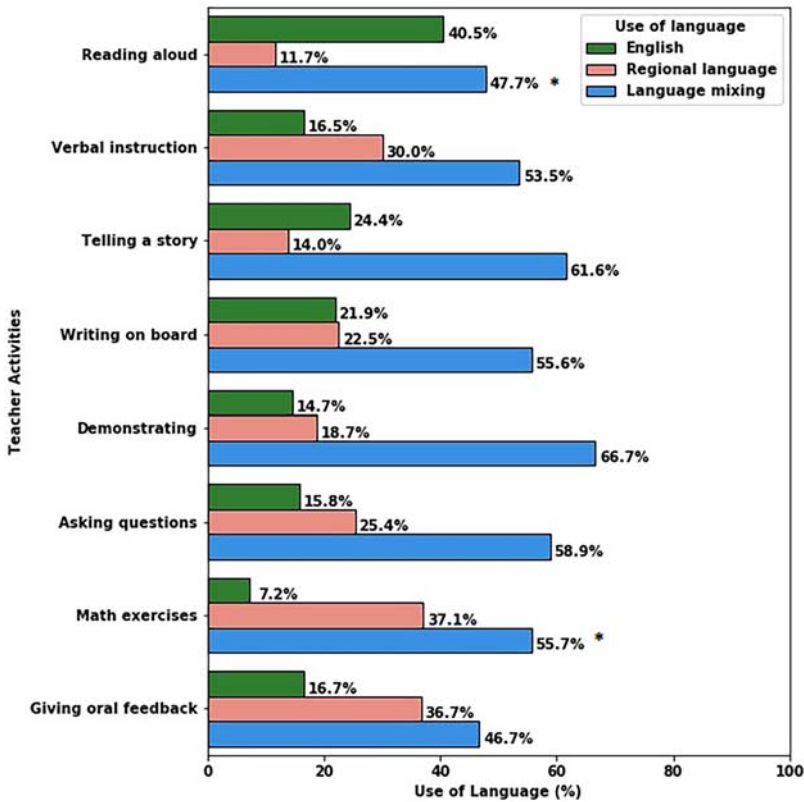


Figure 5. Teacher activities in the classroom in different languages (percentages rounded).

subject classes, medium of instruction and the two cities. In Delhi, none of the teacher activities were carried out in English alone. Therefore the activities shown in Figure 5 under use of English are from Hyderabad.

To explore our question about whether or not there is any link between the languages used and the activity undertaken, it is useful to examine the eight most frequent activities for each type of language. These are shown in Table 5 sorted in descending order of percentage of occurrence in each language.

The majority of the activities in the classroom were carried out using a mix of languages with the percentage of use of language mixing being consistently higher for almost all teacher activities (See Figure 5). The second most used language for the teacher activities was regional language except for reading aloud and telling a story. Among the activities carried out in the classroom with English only,

Table 5. Teacher activities and the preferred use of language/ languages in the classroom.

Use of English only (Hyderabad)	Use of regional language (Hindi in Delhi or Telugu in Hyderabad)	Language mixing (Hyderabad and Delhi)
1 Reading aloud	Maths exercises	Demonstrating
2 Telling a story	Giving oral feedback	Telling a story
3 Writing on board	Giving verbal instructions	Asking questions
4 Giving oral feedback	Asking questions	Math exercises
5 Verbal instructions	Writing on board	Writing on board
6 Asking questions	Demonstrating	Verbal instructions
7 Demonstrating	Telling a story	Reading aloud
8 Math exercises	Reading aloud	Giving oral feedback

reading aloud (40%) was the most frequent, followed by telling a story (24%) and writing on the board (22%). Pearson's Chi square analyses was run to examine if there was an association between teacher activity and languages used. There was a significant relationship [$\chi^2(14) = 66.99$, $p < 0.001^{**}$, $V = 0.20$]. Post-hoc comparisons with Bonferroni correction indicated that the use of English was significantly higher for reading aloud ($p < 0.001$) and use of regional language ($p < 0.002$) for math exercises by comparison with the other activities distinguished here.

It is not surprising that 'Reading aloud' features as the most frequent activity for English only use in Hyderabad given that in English medium schools all textbooks (including maths) are presented in English, and textbooks for English language lessons in either medium are completely in English. In addition, it requires the least load for teachers in terms of English input – they use the content directly from the book. However, returning to the fact that there were no instances of English only usage during a five minute interval in Delhi schools – regardless of medium – it is interesting to note that particularly in Delhi, teachers seem to be supporting the students with greater use of language mixing even when reading aloud from an English only textbook. This was the second most frequent activity observed in Delhi schools, occurring 20% of the time, with no instances of English used alone.

4. Discussion

This study aimed to document teaching practices in English language and maths lessons in two urban sites of India, with a specific focus on language use. The findings from 104 observations allow us to profile multilingual practices used in schools with three different official mediums of instruction.

Although in the Indian primary education system there is officially only one language as the medium of instruction, we notice the overwhelming presence of language mixing across both the cities, truly reflecting the multilingual and multicultural student groups and their language needs in the pedagogical context. This is the case in both English- and regional language-medium of instruction contexts – especially in English subject lessons. Maths lessons in regional-medium schools did not involve as much language mixing by the teachers but this was very common among learners. This could perhaps be explained by the fact that in both Delhi and Hyderabad, numbers are often expressed using English, both in and out of the school environment.

The data also shows differences between Delhi and Hyderabad language use particularly when comparing English-medium schools in each city. Specifically, lessons in Delhi were characterised by the absence of English used on its own by the teachers (as recorded during five-minute intervals), compared to significantly greater use of English alone in Hyderabad English-medium and Telugu-medium schools. Delhi teachers appeared to use a greater amount of language mixing during each lesson. It was interesting to note the continued use of language mixing even when reading aloud from an English-only textbook, perhaps to translate what was being read out to support learner understanding.

Possible reasons why Delhi teachers show a much higher use of language mixing include the fact that government schools in Delhi have been converted to English-medium fairly recently (2013–2014) and without a transition stage or additional training for teachers to deliver education in English. Conversely, Hyderabad EMI schools have had English as the official medium of instruction for a longer period, which could explain why the use of English only is higher in Hyderabad compared to Delhi. Furthermore, as discussed in the data on teachers' own language backgrounds, it is worth noting that a significantly greater proportion of the teachers in Hyderabad reported attending an English medium school themselves, compared to in Delhi (58% vs. 19% respectively ($p < 0.001$, Fisher's exact test)). In addition, despite many teachers stating some ability in additional languages in both cities, language mixing was found to involve the official medium of instruction used together with the regional languages, while no other home languages of the learners have been attested.³

As for language use among the learners, language mixing does not seem to be the most preferred practice in Delhi children. Instead, learners use more Hindi-only in both English and Hindi-medium schools suggesting that language mixing – the most favoured option for the teachers – is a language skill that may develop later as multilingualism skills mature. This asymmetry between teacher and learner language practices in Delhi is not found in Hyderabad where language mixing is the preferred choice among both teachers and learners, regardless of medium of instruction. There is also a greater use of English alone by both teachers and learners in Hyderabad. Potentially, both the increased language mixing and use of English alone by these learners could be related to increased exposure to English alone in their teachers' speech. It is worth noting here also that in English-medium school contexts, learners are likely to also have greater exposure to English through print (textbooks etc.) across the curriculum, which could influence language use along with spoken input provided by the teacher.

The evidence that language mixing is a key feature of the observed classes is an important reflection of the reality outside of school. This finding conforms with Wang (2019), who challenges the concept of medium of instruction, asserting that like the idea of a 'native speaker,' describing the medium of instruction to be employed reflects a monolingual mindset that does not allow for the multilingual reality to be mirrored in the classroom.

Contrary to the notion of translanguaging, medium of instruction operates as a gatekeeper for everyone in the classroom to follow their fixed roles and responsibilities as teachers seek to maximise exposure and students seek to immerse themselves in that exposure. (101)

Our findings contribute to recent theoretical proposals advocating the naturalness and inevitability of language mixing among multilingual speakers in multilingual societies and question the imposition of a monolingual medium of instruction in schools in societies where multilingualism is the norm (Hornberger and Link 2012; García, Skutnabb-Kangas, and Torres-Guzmán 2006).

The relationship between language use and the different types of activities observed shows that if only English is used then the range of activities predominantly involves reading aloud, telling a story, writing on board, giving oral feedback, asking questions and giving verbal instructions; but when other languages are used, the range of activities gets broader (see Table 5) and more frequent (see Figure 5). It appears that teachers in Delhi and Hyderabad are able to extend their range of activity when carrying out the instructional activities using language mixing and/or the regional language alone, contrary to popular expectations that teaching has to strictly be in the official medium of instruction (especially when it is English). This has important implications in considering the relationship between language usage and the teaching practices adopted that may be more or less effective (e.g. teacher-centred vs. learner-centred). Although the number of classes observed in Delhi was relatively small by comparison with Hyderabad, it is worth noting that teacher-centred approaches predominate in all contexts. This is well-documented elsewhere (Bhattacharya 2013; Banks and Dheram 2013; Brinkmann 2015; Sriprakash 2010) and remains an area for further research and development in terms of how more confident use of supportive languages may enable the teachers to experiment further with other practices, away from the relative safety of teacher-fronted, textbook-led teaching and learning.

In addition, classroom interaction based qualitative data would be needed to provide further evidence for the link between languages used per preferred activity in the classrooms observed. It is clear there is a need for a more detailed tool and shorter units of time measured in order to more accurately assess when teachers and learners use which languages, in what combination and for what purposes. This can be achieved by documenting actual classroom exchanges and examining which activities trigger language mixing and what observable potential benefits of such instances of mixing could be. This evidence could potentially enable greater support to teachers for more effectively exploiting their own and their learners' linguistic repertoires in more systematic ways to promote learning whatever the subject.

Across the two sites, Hindi and Telugu are both used on their own in classrooms (without mixing from other languages), in schools where the regional language is the official medium of instruction as well as in schools where it is officially English. This is the case even though these are often not the home languages of the children in class. A reason for this could be that Hindi and Telugu do not pose as much of a linguistic barrier as English (Mohanty 2010). Regional languages are widely used beyond the classroom, in the children's neighbourhoods – if not at home – on the TV and radio, and in society at large. Teachers who have a strong academic base in Hindi or Telugu might also help learners comprehend lessons in English and maths by using a higher proportion of input in a monolingual Hindi or Telugu mode, but at times this may be at the cost of providing adequate English input in the target language class. This remains a matter of further careful exploration in future.

Finally, it is important to note that the use of language and classroom teaching practices are likely to be inextricably linked in terms of their impact on learning, particularly when it comes to developing linguistic resources in English or any other language (Treffers-Daller et al, submitted). While this study gives a useful overview of the multilingual reality of these classrooms – and how teaching practices and language use might interact – there is clearly further research that needs to be undertaken in order to unpack the findings reported. In particular, there is a need for greater exploration of the specific translanguaging practices that are employed by the teacher and learners and how these impact on the development of relevant knowledge and language skills for a range of purposes as per the social, economic and political contexts. Qualitative evidence – such as transcriptions of classroom interaction – could provide more evidence here.

Notes

1. ESRC-DfID project ES/N010345/1.
2. We define a 'slum' as an informal settlement with 'inadequate access to safe water, sanitation and infrastructure, poor structural quality of housing, overcrowding, and insecure residential status' (Preedy and Watson 2010).
3. In Delhi, 17 languages other than Hindi and English are reported by the learners to be their home languages. Of those, three are the most frequent in the learners' linguistic profile, namely Bhojpuri, Rajasthani, Haryavni. In Hyderabad, 11 languages other than Telugu and English are reported; of those, the following five are the most frequent: Hindi, Lambadi, Urdu, Kannada and Marathi.

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Notes on contributors

Amy Lightfoot is currently the interim Director English for Education Systems for South Asia and leads on strategy development and quality assurance of the British Council's English language projects and related research activities across the region. Her areas of interest and expertise include English in multilingual contexts, teacher professional

development and the use of technology by teachers. She holds an MA in Education and International Development from University College London and an MA in English Language Teaching from the University of Bath.

Anusha Balasubramanian is a qualified speech and language pathologist. She has completed her doctorate from the School of Psychology and Clinical Language Sciences at the University of Reading. She is currently working as a Post-doctoral Research Associate at the University of Cambridge. Her research interests are understanding the cognitive-linguistic abilities in bi-literate bilingual children, adults and neurologically impaired population.

Ianthi Tsimpli is Professor of English and Applied Linguistics and Fellow of Fitzwilliam College at the University of Cambridge. She works on multilingualism, first and second language acquisition in children and adults, language impairment, attrition, bilingualism, language processing and the interaction between language, cognition and print exposure. She holds a BA in Modern Greek Studies from the University of Athens and a PhD in Linguistics from University College London (1992). She is Associate Editor of *Glossa* and member of several Editorial Boards of journals on bilingualism and language acquisition.

Lina Mukhopadhyay is a Professor at the Department of Training and Development, School of English Language Education, the English and Foreign Languages University (EFLU), Hyderabad, India. She has a PhD in second language acquisition from EFLU (formerly CIEFL). Her research interests are second language acquisition, reading development, language assessment and testing, and bi/multilingual education and she has published in each of these areas.

Jeanine Treffers-Daller is Professor Emerita at the University of Reading. She has published extensively on multilingualism and language contact in different contexts, as well as on language dominance, listening comprehension and motion event construal in bilinguals and L2 learners. She is a member of the Editorial Board of *Bilingualism, Language and Cognition* and of the *International Journal of Bilingualism*.

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