Bilingual Instruction and Political Discrimination of Ethnic Outgroups: Evidence from a Natural Experiment in Malaysia*

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Abstract

Why do some individuals discriminate against ethnic outgroups more than others in the political space? This article argues that variation in political prejudice against ethnic outgroups may be explained by a person's language training in school. Specifically, individuals who received bilingual instruction should display less political discrimination against outgroup members than those who received monolingual instruction. By promoting the acquisition of a second language, bilingual education facilitates the cognitive development of perspective-taking ability, which in turn should foster more inclusive political attitudes. I find support for this argument through an investigation of an education reform in Malaysia, where affected Malay students experienced a mixture of English and mother tongue instruction while the rest were taught only in their native language. The evidence also points to the possibility of bilingual education as a compensatory avenue to narrow the perspective-taking ability gap between those who were raised in monolingual and bilingual families.

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Ethnic outgroup discrimination and ingroup favoritism are pervasive issues in many multi-ethnic societies. Citizens generally display a strong preference to vote for coethnic candidates as opposed to non-coethnic ones (e.g., Adida, 2015; Bratton et al., 1999; Chauchard, 2016; Ferree, 2006; McConnaughy et al., 2010; Posner, 2005). Similarly, political elites tend to implement policies that mainly benefit members of their own ethnic groups (e.g., Chandra, 2004; De Luca et al., 2018; Dickens, 2018; Ejdemyr et al., 2018; Kramon and Posner, 2016). In addition, this interplay between primordial identities and political behavior further exacerbates the under-representation and exclusion of ethnic minorities, which in turn raises the likelihood of ethnic civil wars (Buhaug et al., 2014; Cederman et al., 2010). Hence significant attention has been paid to the remedies and factors that might reduce an individual's tendency to discriminate against ethnic outgroups in the political space. Notable examples include institutional reforms such as the use of quotas to guarantee minority representation (Chauchard, 2017; Dunning and Nilekani, 2013; Parthasarathy, 2017), the impact of cross-cutting contact and networks in minimizing the salience of ethnic identities (Adida et al., 2016; Brown et al., 2021; Dunning and Harrison, 2010; Paler et al., 2020), and the role of information access in reducing voters' dependence on ethnic labels as a heuristic for evaluating political candidates (Adida et al., 2017; Carlson, 2015; Conroy-Krutz, 2013).

In this article, I consider the efficacy of bilingual instruction as another possible avenue to mitigate the political discrimination of ethnic outgroups. Drawing on insights from the bilingualism and perspective-taking research in psychology (see Galinsky et al., 2005), this article provides a cognitive account for why bilingual education promotes more inclusive political attitudes toward ethnic outgroup members. To be precise, bilingual instruction refers to the use of two languages to teach content subjects such as History or Mathematics.[1] This type of instructional method should facilitate second language acquisition (e.g., Reljić et al., 2015; Rolstad et al., 2005; Slavin and Cheung, 2005), thereby creating bilingual speakers who are better at understanding other individuals' motives and actions – i.e., perspective-

[1]Hence this concept does not encompass the teaching of a second language as a separate subject, such as Spanish or German classes in most American schools.

taking (e.g., Javor, 2017; Rubio-Fernández and Glucksberg, 2012; Schroeder, 2018). Part of the answer for why bilinguals are better perspective-takers than monoglots relates to the former's cognitive versatility to switch between two languages, allowing them to speak in a language that can be understood by the listener. This iterative process of changing and adapting to various listeners' linguistic demands promotes the cognitive development of perspective-taking ability among bilinguals, where they are subconsciously trained to curtail their own predispositions and biases while shifting their attention toward the mental state of the perspective-taking target (e.g., Bialystok and Viswanathan, 2009; Carlson and Meltzoff, 2008). This ability to take the positions of other individuals should in turn translate into lower levels of political discrimination against ethnic outgroups (e.g., Adida et al., 2018; Kalla and Broockman, 2020), the latter of which is defined as an individual's propensity to exclude members of ethnic outgroups from participating in a country's political process.

To test these claims, I analyze the impact of an education reform in Malaysia, where the ethnic majority language – i.e., *Bahasa Melayu* (BM) – was replaced by English as the language of instruction for Mathematics and Science across all public secondary schools in 2003.[2] Specifically, ethnic Malay citizens (i.e., the ethnic majority group in Malaysia) who were born between 1990 and 1995 would have been exposed to a mixture of English and BM instruction during their five-year secondary school education, whereas those who were born between 1985 and 1989 would have received monolingual instruction based solely on their mother tongue for all subjects including Mathematics and Science in their schools. An original survey comprising 2,000 ethnic Malay participants was administered in March 2022, and they were asked a series of questions that measure their political attitudes toward ethnic minorities in Malaysia. Leveraging the as-if random assignment of the type of language of instruction used in schools, I find that ethnic Malay participants who received bilingual instruction during their secondary school education display lower levels of political discrimination against ethnic outgroups than those who received monolingual in-

[2]For the rest of this article, the term "Malay" is used exclusively to refer to the ethnic group while the acronym "BM" refers to the language spoken by the Malay ethnic group in Malaysia.

struction. The results are also robust to a variety of sensitivity analyses and alternative explanations such as inter-ethnic contact. Finally, I also provide suggestive evidence that bilingual education may also compensate for inequalities in family socialization with regard to the cognitive development of perspective-taking ability. Indeed, the reform had the largest impact in improving perspective-taking ability among ethnic Malay participants who only speak their mother tongue at home – i.e., the group of individuals who would have remained as monolingual speakers if not for the language reform in 2003.

This article makes four contributions. First, it builds on the rich literature that the development of political norms and values can be traced to one's early upbringing in schools (e.g., Campbell and Niemi, 2016; Cavaille and Marshall, 2019; Galston, 2001; Neundorf et al., 2016). Specifically, it argues that the socializing impact of education extends beyond the acquisition of civic skills and political knowledge in schools (e.g., Campbell and Niemi, 2016; Finkel and Ernst, 2005; Niemi and Junn, 1998). Education also influences our cognitive ability to acknowledge and accept members of ethnic outgroups. Second, the findings from this research have practical implications for education policymakers working in ethnically divided societies. Third, this article also highlights the importance of studying variations in political attitudes and behaviors through a psycholinguistic angle. Previous works have shown that the language we speak can influence our outlook on a variety of issues, such as investment and health choices (Chen, 2013), climate change (Pérez and Tavits, 2017), protection of minority rights (Pérez and Tavits, 2019*a*) as well as gender equality (Liu et al., 2018; Pérez and Tavits, 2019*b*; Tavits and Pérez, 2019). This research underscores the cognitive influence of bilingual education in mitigating ethnic discrimination in the political realm by enhancing citizens' ability to put themselves in the shoes of disadvantaged groups. As such, the theoretical mechanisms outlined in this article may be generalizable to other ethnolinguistic settings and other ostracized outgroups such as immigrants and refugees. Lastly, this study complements a long line of research that are grounded in the psychological microfoundations of ethnic politics (e.g., Adida et al., 2017; Hale, 2008; Paler et al., 2020).

Bilingualism, Perspective-Taking & Outgroup Attitudes

One of the more immediate consequences of bilingual education is an increase in the number of hours that a student will have to read, write and speak in a second language in school. As mentioned in the introductory section, this article focuses on the political effects of language as a *medium of instruction* for content subjects such as Mathematics and Science[3], as opposed to language as a *subject* such as Spanish classes in American schools. A key difference between the two relates to the level of language immersion that students are exposed to. In particular, the former approach creates a more naturalistic language learning environment by providing a purpose for language use in the classroom as well as increasing the amount of exposure to the second language (Dalton-Puffer et al., 2010). This should therefore increase the likelihood that students will develop into bilingual speakers in the future (e.g., Reljić et al., 2015; Rolstad et al., 2005; Slavin and Cheung, 2005). In addition, bilingual education can be especially beneficial for students who only converse in their mother tongue at home, by offering a compensatory avenue to make up for the lack of second language exposure and training in monolingual contexts (e.g., Pérez Cañado, 2018; Rumlich, 2020).

By improving their proficiency in the second language in addition to their mother tongue, students develop into bilinguals whose perspective-taking ability is widely considered to be superior to monolinguals. Why are bilinguals better at contemplating and comprehending other individuals' intentions and actions than monolingual speakers? Schroeder (2018) summarizes three prevailing explanations. First, several cognitive scientists argue that bilingualism improves executive functioning such as attention control, working memory and inhibition abilities – i.e., cognitive functions that are crucial for perspective-taking (e.g., Bialystok and Viswanathan, 2009; Carlson and Meltzoff, 2008; Lehtonen et al., 2018). Due to the habitual process of frequently switching between two languages and the suppression of one medium in order to use the other, bilingual children and adults are subconsciously trained to control

[3]This is more commonly referred to as Content and Language Integrated Learning (CLIL) programs in the field of education research. See Dalton-Puffer et al. (2010) for a review of CLIL programs.

and down-weigh their prior beliefs and knowledge while "up-regulating" or shifting their attention toward understanding another person's mental state (Schroeder, 2018, 2).

A second set of explanations focuses on bilinguals' heightened sense of metalinguistic awareness, defined as the ability to dissect and reflect on the properties of a language (Bialystok and Barac, 2012; Diaz and Farrar, 2018). As an example, Estonian-Russian bilinguals' innate capacity to distinguish between a language that has gender markings (i.e., Russian) and a genderless tongue (i.e., Estonian) might be translated into a more general understanding that two people can interpret and react to the same event differently. Indeed, Pérez and Tavits (2019*b*) observe that Estonian-Russian bilinguals tend to display more gender unequal attitudes when interviewed in Russian than those who were assigned to interview in Estonian. This empirical finding therefore lends support to the view that bilinguals' cognitive flexibility to alter their predispositions and opinions under different linguistic contexts might explain why they perform significantly better than monolinguals in assuming the beliefs and motivations of a perspective-taking target while downplaying their own mental states. Lastly, the socio-pragmatic account postulates that the ability to switch between multiple languages allows bilinguals to operate more effectively in multi-cultural settings, thereby leading to a greater appreciation that different language speakers may subscribe to different systems of beliefs and values, as well as an improved ability to consider another person's mental state (e.g., Fan et al., 2015; Goetz, 2003).

Taken together, a common theme linking the three sets of explanations is that the ability to take the perspectives of others can be improved upon when individuals operate in environments where they are constantly forced to switch between two (or more) languages.[4] It is the repeated process of switching and adapting to the linguistic needs of different audiences that facilitates the cognitive development of perspective-taking ability among bilinguals. Moreover, the fact that perspective-taking effects are observed among Arabic-Hebrew speakers in Israel (Bekerman and Horenczyk, 2004), English-Tamil bilinguals in India (Bialystok

[4]Indeed, the above mechanisms may also be generalizable to multilingual contexts where individuals learn and speak three or more languages.

and Viswanathan, 2009), Hungarian-Serbian bilinguals in Serbia (Javor, 2017) etc., suggests that the relationship between bilingualism and perspective-taking ability may be applicable across a variety of linguistic and country contexts. Put simply, these explanations are agnostic about whether a specific type of second language should promote the development of perspective-taking ability: it does not matter whether the second language spoken by the bilingual is an ethnic minority language (e.g., Russian in Estonia) or a colonial tongue (e.g., English in India); simply being able to speak more than one language should facilitate the development of perspective-taking ability.

Another important implication from the research on bilingualism and perspective-taking is that individuals who were brought up in bilingual families should enjoy an *ex ante* perspective-taking advantage over those who were raised in monolingual homes, given that there is a higher rate of language switching among individuals from bilingual families relative to those from monolingual backgrounds. This perspective-taking gap between learners from monolingual and bilingual families however may be narrowed with the introduction of bilingual instruction in schools. Specifically, bilingual education compensates for the lack of second language training in monolingual homes by providing an opportunity for these students to immerse themselves in a bilingual setting while cultivating their perspective-taking capacity through the use of two languages. There is some evidence to suggest the plausibility of the perspective-taking compensation hypothesis: Kalashnikova and Mattock (2014) for instance report that English-speaking children who later acquired Welsh as a second language outperformed their monolingual English-speaking counterparts in terms of attention control – i.e., the ability to direct attention toward another subject or target.

This tendency to exhibit less egocentric bias (or higher perspective-taking) among bilingual speakers should in turn reduce their susceptibility to discriminate against ethnic outgroup members. By incorporating the other in the self, perspective-takers develop a sense of connectedness and affinity with the perspective-taking target (Galinsky et al., 2005), of which the latter is transformed from a member of an objective outgroup (e.g., ethnicity)

into a subjective ingroup (i.e., shared mental states between the perspective-taker and the target). Taking the perspective of an individual from an ethnic minority group who, for instance, has been denied entry into a university because of her ethnic membership, may also lead to a more general realization that this predicament extends to other members of the target's ethnic group as well (Todd et al., 2012). In addition, studies have shown that the propensity to attribute negative facts about an ethnic outgroup to dispositional (e.g., ethnic group A is poor because its members are lazy) as opposed to situational (e.g., ethnic group A is poor because of discriminatory hiring practices) explanations can be mitigated by perspective-taking (Todd et al., 2012; Vescio et al., 2003). Notwithstanding its salutary influence on ethnic attitudes, perspective-taking is also linked to more inclusive behavior toward a variety of ostracized social outgroups, such as refugees and immigrants (Adida et al., 2018; Alan et al., 2021; Kalla and Broockman, 2020, 2021; Williamson et al., 2021), the LGBT community (Broockman and Kalla, 2016), outgroup partisans (Tuller et al., 2015), and former perpetrators of political violence (Bilali and Vollhardt, 2013).

Broadly speaking, bilinguals' propensity to exhibit less ethnic outgroup discrimination may be explained by their perspective-taking ability, which is accumulated over time due to their bilingual training at home and/or at school. In other words, bilinguals do not need to rely on perspective-taking imagery or vignettes in order to feel compelled to put themselves in the shoes of others; they are *ex ante* more mindful of other individuals' beliefs and actions, and are more likely to practice perspective-taking as an everyday social function than monolinguals. Indeed, Singh et al. (2020) observe that bilingual English-Mandarin children in Singapore demonstrated less implicit bias against African race individuals than children who only spoke Mandarin. This finding is remarkable, considering the fact that people of African descent constitute less than one percent of the resident population in Singapore and that the participants did not receive any perspective-taking information about the African race individuals during the survey, thereby ruling out the possibility of cross-ethnic contact or other interventions as intermediary factors inducing perspective-taking among bilinguals.

Put simply, perspective-taking may be viewed as a cognitive ability that can be employed even in the absence of ingroup-outgroup contact or other perspective-taking stimuli.

To summarize the theoretical arguments, the primary expectation of this article is that individuals who received bilingual instruction in schools should display lower levels of political discrimination against members of ethnic outgroups than those who received monolingual instruction. For one, a prolonged exposure to bilingual education increases the likelihood that an individual will develop into a bilingual speaker who is more adept at putting herself in the shoes of other people. Moreover, schools may provide a compensatory pathway for students from monolingual backgrounds by bridging the perspective-taking disparity between those who were raised in monolingual and bilingual families. Taken together, the resulting improvement in perspective-taking ability should in turn reduce bilingual speakers' propensity to discriminate against ethnic outgroup members.

Case Selection: Bilingual Instruction in Malaysia

I test my claims by exploiting the exogenous introduction of an education reform in Malaysia. There are several reasons why Malaysia is an ideal case for analyzing the effect of bilingual education on ethnic outgroup political discrimination. First, Malaysia is a multi-ethnic country where ethnicity is a salient political issue. The country's population comprises three main ethnic groups: Malays and other indigenous peoples (67.4%), Chinese (24.6%), and Indians (7.3%). Since its independence in 1957, the Prime Minister of Malaysia has always come from the majority Malay ethnic group. Political parties are also organized primarily by ethnic heritage. In addition, the constitution contains provisions that grant a "special position" to ethnic Malays while the rights of other ethnic minorities are marginalized. The introduction of the New Economic Policy in 1971 further exacerbated the unequal treatment of ethnic minorities through the use of aggressive pro-Malay quotas for admission into public universities, civil service employment and business licenses. These policies continue to garner

widespread support within the majority Malay population. According to one survey, 59% of ethnic Malay respondents agree or strongly agree that Malays should continue to enjoy special rights and privileges because they are the original inhabitants of the country (Merdeka Center for Opinion Research, 2010). Hence Malaysia provides an interesting test case to examine whether the education reform had any impact in promoting more inclusive political attitudes among members of an ethnic majority group.

The second reason relates to the nature of the education reform in Malaysia. Given that the second language was only used to deliver STEM (i.e., Science, Technology, Engineering, and Math) content, it seems reasonable to expect that the amount of second language application and immersion should be considerably lower than, for instance, the use of the second language to teach humanities subjects such as History or Geography. This can have downstream implications on our ability to detect any discernible differences in the level of second language proficiency, perspective-taking ability as well as outgroup political prejudice between students who were affected by the reform and those who were not. However, if we can still observe significant effects in the Malaysia case, then it stands to reason that these effects should be substantially stronger in other contexts where bilingual education is practiced in disciplines that require a more intensive use of the second language. The Malaysia case therefore represents a hard empirical test of the theoretical expectations outlined above.

Third, while the preceding discussion suggests a causal relationship between bilingual instruction and political discrimination of ethnic outgroups, it is difficult to test this hypothesis empirically. For one, the type of language of instruction received may be confounded by other pretreatment factors such as parents' ethnic attitudes. For instance, individuals may self-select themselves into monolingual schools because their parents do not want them to learn a second language that is not native to their own ethnic group (see Huddy and Sears, 1995). As such, ethnic outgroup discrimination among individuals who received monolingual instruction may simply be a reflection of their parents' outgroup biases. Moreover, analyzing the political effects of bilingual education through an experimental framework may pose ethical

concerns for participants, as the type of language of instruction used in schools can have significant future repercussions on the development of human capital and labor outcomes (e.g., Eriksson, 2014; Laitin and Ramachandran, 2016). As such, the Malaysia case provides a unique natural experimental setting to test the paper's expectations.

Education Reform in Malaysia

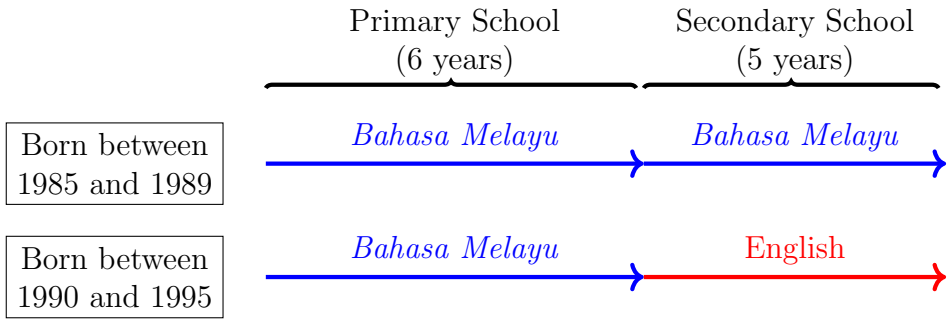
Concerned about the general lack of English proficiency among ethnic Malay students, then Prime Minister Mahathir Mohamad announced on May 6, 2002, that Mathematics and Science would be taught in English across all public primary and secondary schools starting from 2003.[5] As part of the nationwide reform, students who were beginning their form one education in 2003 (or the equivalent of grade seven in the US) and subsequent cohorts would receive English instruction for all STEM subjects during their five-year secondary education. This meant that ethnic Malay students who were affected by the reform would be exposed to bilingual instruction during their secondary school education – i.e., Mathematics and Science were taught in English and non-STEM classes were delivered in *Bahasa Melayu* (BM). Under the new reform, approximately 40% of the teaching time in school was dedicated to English instruction, with the remaining 60% being taught in BM (Gill, 2013). In contrast, the reform did not apply to those who had already advanced to form two or higher in 2003; hence they would continue to receive BM instruction for all subjects – i.e., monolingual instruction.

Given that children in Malaysia typically begin their primary education at the age of seven as well as the fact that the education system is structured on a $6 + 5 + 1.5$ model[6], we can identify how the introduction of the language reform in 2003 affected different birth year cohorts of ethnic Malay students. For instance, the pioneer cohort of form one students who received English instruction for STEM subjects during their secondary school education

[5]The rest of the article focuses on ethnic Malay secondary school students who were affected by the new policy. Detailed descriptions of the education system in Malaysia and the language reform can be found in Supplementary Information (SI) sections 1a and 1b respectively.

[6]Specifically, students in Malaysia experience six years of primary education, five years of secondary education, and one and a half years of pre-university training.

Figure 1: **Language of Instruction for STEM Subjects in Public Schools**



would be born in 1990 – i.e., they would have turned thirteen years old in 2003. On the other hand, ethnic Malays who were born in 1989 or earlier would have studied Mathematics and Science in BM – i.e., they would have advanced to form two or higher in 2003 thereby missing the cutoff to study STEM subjects in English during their five-year secondary school education. In light of the narrow timeline between the announcement date (i.e., May 6, 2002) and the implementation of the policy change (i.e., January 2003), it is also unlikely that students before the cutoff could manipulate the likelihood of receiving English or BM instruction. In addition, grade skipping and repetition are uncommon in Malaysian schools. Overall, this implies the arbitrariness of the cutoff as well as the quasi-randomized nature of the reform. Figure 1 illustrates the language of instruction for STEM subjects across different birth year cohorts of ethnic Malay students who were born between 1985 and 1995.

In addition, there are several reasons to suggest that the reform was successful in improving second language proficiency among affected secondary school students in Malaysia, which in turn should increase their perspective-taking ability as well as reducing their propensity to discriminate against ethnic outgroups. First, the policy change resulted in a substantial increase in the number of teaching hours dedicated to English instruction in schools. While their predecessors' exposure to English-medium classes was limited to just two hours per week, students who were affected by the reform spent more than 10 hours per week learning Mathematics and Science in English, on top of their usual English language classes (Gill, 2013). This also implies that affected students experienced a higher frequency of language

switching between their mother tongue (through non-STEM classes) and English (through STEM classes) in the classroom. Second, the education reform affected intermediate learners who would have acquired a basic level of English literacy during their early education years since English is a compulsory subject at the primary school level (i.e., from grades one to six), thereby making the transition from monolingual to bilingual instruction less onerous.[7] Third, the Malaysian government put in place additional measures to ensure that teachers were properly trained to deliver STEM classes in English. These include the development of a national re-training program for STEM teachers, a buddy support program that matched STEM teachers with their language counterparts, and the supply of self-teaching materials for instructors to facilitate their own learning (Gill, 2013).

Survey Design & Empirical Strategy

An IRB-approved, pre-registered survey comprising more than 2,000 participants was fielded in March 2022.[8] The survey was administered in BM to ensure consistency in the interpretation of the questions (Pérez, 2017) and to eliminate any unintended language effects that might contaminate the observed empirical findings (e.g., Pérez and Tavits, 2019*a*,*b*).

The sampling frame of the survey was limited to individuals who (1) were ethnic Malays, (2) had completed their secondary school exit examination (i.e., *Sijil Pelajaran Malaysia*, SPM), and (3) were born between the years of 1985 and 1995. On the first requirement, I exclude other ethnic minority groups given that individual opinions about outgroup political discrimination may vary significantly across members of different ethnic groups. For instance, ethnic Malays may display a preference for maintaining their privileged political position in Malaysian society while other minority groups may favor a more equitable relationship vis-à-vis the majority group. In addition, ethnic Malays tend to enroll into public secondary

[7]However, it must be emphasized that students did not spend a significant amount of time learning English in primary schools since a majority of the classes were still delivered in their native tongue i.e., BM.

[8]The survey design was pre-registered on February 28, 2022. A copy of the pre-analysis plan is available at https://osf.io/mr59g. SI section 2a provide details on the survey design and variable measurements.

schools that were not immune from the language reform in 2003.[9] The second prerequisite – i.e., secondary school graduation – ensures that participants who were born after the cutoff would have a higher chance of experiencing English-medium instruction for STEM subjects during their secondary school education. Lastly, I exclude ethnic Malays who were born after 1995 as they were affected by the reversal of the policy in 2012. Specifically, individuals who were born after 1995 did not receive the full five-year English instruction for STEM subjects at the secondary level, unlike their peers who were born between 1990 and 1995.[10]

Measuring Political Discrimination Against Ethnic Outgroups

I define ethnic outgroup political discrimination as an individual's propensity to deny members of ethnic outgroups to participate in a country's political process (see Sorens, 2010). Accordingly, individual displays of political discrimination on the basis of ethnic identity may be manifested through a person's (1) choice of local political representative, (2) choice of the country's chief executive, (3) view on the political rights of non-coethnic members in the country, and (4) opinion regarding the influence of ethnicity in shaping partisan politics in the country. Questions were adapted from existing attitudinal surveys in Malaysia (e.g., Al Ramiah et al., 2017; Merdeka Center for Opinion Research, 2010).

The first aspect relates to an individual's preference in relation to the ethnicity of her political representative. Each respondent was presented with a pair of hypothetical politicians who are competing to be the Member of Parliament (MP) of her district (Table 1).[11] To mitigate the likelihood of eliciting socially desirable responses, the "Ethnicity" attribute was randomized between "Chinese" (non-coethnic) and "Malay" (coethnic) while the other features were not varied (see Butler and Tavits, 2021).[12] Participants then rated the likeli-

[9] Only one percent of the survey respondents reported that they had attended private secondary schools. Responses from these participants were dropped from the empirical analysis.

[10] Beginning 2012, BM became the language of instruction for all subjects at all public secondary schools. See SI section 1b for a detailed description of the policy reversal in 2012.

[11] Malaysian MPs are elected in single-member districts using plurality rule.

[12] Table SI2d.4 shows that the impact of the reform, language of instruction used in schools, as well as various demographic variables such as gender and income are balanced across the two profiles.

Table 1: **Hypothetical Profiles of Political Candidates in Malaysia Survey**

	Hypothetical Candidate Profiles	
Attributes	A	B
Malaysian citizen	Yes	Yes
Age	53 years old	61 years old
Marital status	Married	Married
Number of children	3	1
Occupation	Civil servant	Business owner
Ethnicity	Chinese/Malay	Chinese/Malay
Gender	Female	Male
Highest education	Bachelor's Degree	Doctoral Degree

hood of voting for each candidate on a scale from 1 ("very unlikely") to 10 ("very likely"). The first outcome measure is *Coethnic MP*, which is the difference between a respondent's self-reported likelihood of voting for a Malay candidate and the likelihood of voting for a Chinese candidate. This variable ranges from -9 to 9, where a larger value indicates that the Chinese politician is discriminated at a greater degree relative to the Malay politician.

The second dimension of political discrimination measures an individual's preference with regard to the ethnicity of the country's chief executive. *Coethnic PM* is a 4-point ordinal variable measuring an ethnic Malay respondent's level of agreement toward the statement, "The Prime Minister of Malaysia should always be a Malay." In spite of the fact that the sentence was strongly worded, more than 85% of the participants either agree or strongly agree with the statement, which underscores the salience of ethnicity in Malaysian politics and that a majority of Malays have grown accustomed to the notion of having a member of their own ethnic group as the country's chief executive. Third, *Ethnic Rights* asked respondents whether they strongly disagreed, disagreed, agreed, or strongly agreed with the view that "People should be treated and given the same rights in Malaysia regardless of race or religion." The last dimension relates to participants' opinion about the ethnicized nature of party competition in Malaysia i.e., *Ethnic Parties*. Respondents read the following statement: "There should be no race-based parties in Malaysia." A higher level of disagreement

implies that the respondent supports the continued presence of ethnic parties to protect Malay interests. Responses for *Coethnic PM*, *Ethnic Rights*, and *Ethnic Parties* are recoded so that higher values reflect greater political discrimination against non-coethnic groups. Finally, I construct an overall index of ethnic outgroup political discrimination – i.e., *Ethnic Discrimination* – by normalizing and summing the responses for the four measures.[13]

Measuring Mechanisms: English Proficiency & Perspective-Taking

To measure second language proficiency, the survey asked participants the following question: "In your opinion, how well do you know English?" The variable *English Proficiency* is then coded on a 5-point Likert scale, ranging from "Do not know the language at all" to "Fluent". Although a more objective measure of English literacy would be to ask respondents to provide English test results from their secondary school exit examinations, it is possible that a large proportion of respondents might not remember their scores as they had left school for more than a decade, thereby leading to more incorrect or missing responses.[14]

Perspective-taking ability is measured using the perspective-taking sub-scale from the Interpersonal Reactivity Index (IRI, see Davis, 1983). Specifically, participants read a total of seven statements that measure their perspective-taking ability (e.g., "Before criticizing somebody, I try to imagine how I would feel if I were in their place") and answer on a 5-point Likert scale ranging from "Does not describe me well" to "Describes me very well". The responses are normalized and summed to create a composite index of *Perspective-Taking* ability (Cronbach's $\alpha = 0.67$). One benefit of the IRI is that the items can be easily administered in a survey setting, unlike other measures such as the Theory of Mind test (Baron-Cohen et al., 1985). The perspective-taking sub-scale from the IRI has also been shown to correlate strongly with other common measures of cognitive empathy such as Empathy Quotient (Melchers et al., 2015) and the Basic Empathy Scale (Jolliffe and Farrington, 2006).

[13]Descriptive statistics of the variables used in the empirical analyses are presented in Table SI2b.2

[14]In addition, there is the potential problem of nonrandom missingness, where participants who had received higher English test scores were more likely to provide non-missing responses than those who received lower scores, which in turn creates an upward biased estimate of English proficiency.

Pretreatment Covariates

The first pretreatment covariate is *Female*, which equals one if female and zero otherwise. Next, *Urban School* equals one if a respondent indicated that she had attended a secondary school in an urban area and zero otherwise. Finally, *Multilingual Home* provides a measure of a respondent's language exposure at home. This variable equals one if a respondent specified more than one language in response to the question, "What language(s) do you normally speak at home?", and zero otherwise. Other demographic variables such as highest education qualification, income, and employment were asked in the survey but are omitted from the baseline models because they are observed after the treatment and hence might induce posttreatment bias in the model estimates (Montgomery et al., 2018).

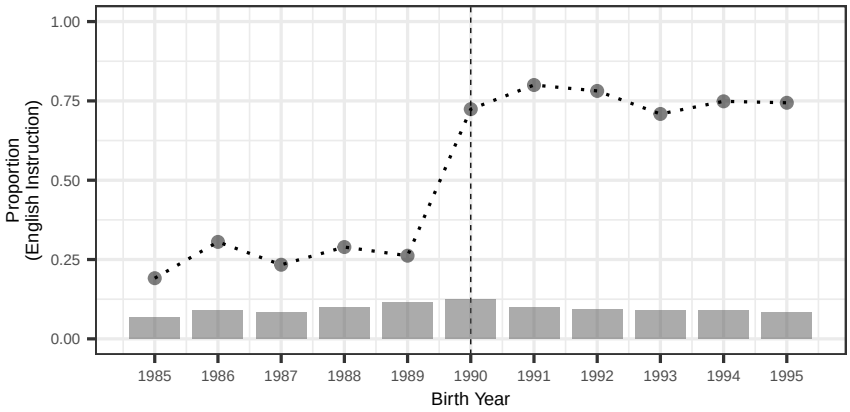
Estimating Two Types of Average Treatment Effects

Recall that the language of instruction for STEM subjects at the secondary level should be English among ethnic Malays who were born between 1990 and 1995, and BM for those who were born between 1985 and 1989. To verify if the education reform coincided with participants' birth years, respondents indicated whether English or BM was used to teach STEM subjects during their secondary school education. The findings from Figure 2 suggest that the reform should be regarded as an encouragement intervention, by increasing the probability that a respondent who was born between 1990 and 1995 received English instruction for STEM subjects at the secondary school level.[15]

In light of Figure 2, I use a fuzzy regression discontinuity (RD) approach to estimate the local average treatment effect (LATE) for a subset of compliers who were born just before or after the birth date cutoff at January 1, 1990. Specifically, *Reform* is an instrument that equals one if a respondent's birth date falls between 1990 and 1995, and zero otherwise. The main predictor is *Bilingual Instruction*, which equals one if a respondent reported that En-

[15] I provide additional evidence in Table SI2c.3 that an individual's birth year predicts the type of language of instruction used in schools through both linear and logit regression models.

Figure 2: **Respondents' Birth Year & Language of Instruction for STEM Subjects**



Notes: Each point in the plot corresponds to the proportion of respondents within a birth year cohort who reported that English was the language of instruction for STEM subjects at the secondary school level. The vertical dashed line refers to the cutoff year at 1990, while the vertical bars reflect the frequency distribution of the survey respondents by their birth years.

glish was the language used to teach STEM subjects during her secondary school education, and zero otherwise. Note that individuals who received English instruction for STEM subjects also received BM instruction for non-STEM subjects – hence bilingual instruction. In contrast, those who reported BM instruction for STEM classes received the same language of instruction for non-STEM subjects as well – i.e., monolingual instruction. Formally,

$$\text{Bilingual Instruction}_i = \alpha + \gamma \text{Reform}_i + f(x_i) + \psi Z_i + \epsilon_i$$

$$Y_i = \zeta + \tilde{\beta} \widehat{\text{Bilingual Instruction}}_i + f(x_i) + \delta Z_i + \mu_i$$

where Y_i is the outcome measure of ethnic outgroup political discrimination, Z_i is a vector of pretreatment covariates, and $\tilde{\beta}$ is the LATE at the cutoff. To increase the precision of the running variable and to approximate the continuity assumption underlying fuzzy RD designs, x_i is defined as the difference in the number of days between a respondent's birth date and January 1, 1990 ($x_i = \text{Birth Date}_i - \text{January } 1, 1990$). Next, $f(x_i)$ is a linear function of the running variable x_i. The LATE at the cutoff is then estimated by picking an optimal bandwidth within which the functional form between the running variable and the outcome

measure can be approximated using $f(x_i)$, with larger triangular kernel weights assigned to observations that are closer to the cutoff at January 1, 1990 (Calonico et al., 2014).

To increase external validity, I estimate another set of instrumental variables regression models by dropping the linear function $f(x_i)$ and replacing it with birth year fixed effects θ_i:

$$\text{Bilingual Instruction}_i = \alpha + \gamma \text{Reform}_i + \psi Z_i + \theta_i + \epsilon_i$$
$$Y_i = \zeta + \bar{\beta} \widehat{\text{Bilingual Instruction}}_i + \delta Z_i + \theta_i + \mu_i$$

Whereas the previous RD approach estimates the LATE at the birth date cutoff of January 1, 1990, the above specification estimates the average treatment effect among compliers from the full sample of respondents who were born between 1985 and 1995 (i.e., $\bar{\beta}$ = complier average causal effect, or CACE). This identification strategy is feasible, given the quasi-randomized nature of the reform in assigning the type of instructional language.

The two estimation strategies are valid insofar as three additional identifying assumptions are satisfied. First, Figure 2 and Table SI2c.3 from the Supplementary Information (SI) show that the reform increased the probability of English instruction among individuals who were born between 1990 and 1995 (relevance assumption). Second, the reform only affected ethnic discrimination through its effect on *Bilingual Instruction* (exclusion restriction). This is plausible as it is hard to imagine how a person's birth date can have downstream effects on ethnic attitudes without working through the language of instruction channel. Lastly, it is unlikely that individuals would make a conscious effort to do the exact opposite of what they were supposed to do before or after the reform ("no-defiers" assumption).

Results

Table 2 reports the effects of bilingual instruction on ethnic outgroup political discrimination for a subset of compliers who were born close to the cutoff date at January 1, 1990 (Panel A), and for the full sample of compliers in the survey (Panel B). Beginning with model (1)

in Panel A, the estimated LATE of bilingual instruction on the composite index of ethnic outgroup discrimination fails to achieve the conventional level of statistical significance. This result is mainly driven by the observation that the coefficient signs of the predictor variable vary from one component measure to another. For instance, exposure to bilingual instruction is associated with less ingroup favoritism with regard to the choice of the country's chief executive (*Coethnic PM*), but higher levels of outgroup discrimination in terms of the political rights of ethnic minority groups in Malaysia (*Ethnic Rights*). These findings could be indicative of a sense of frustration and resentment among the inaugural cohorts of students (and their parents) who had to suddenly adapt to the new curriculum requirements under the reform, which in turn might have induced some level of political prejudice against ethnic outgroups. Similar mixed findings are also observed when a quadratic function of the running variable was employed (Table SI3b.7).

Notwithstanding, the results from Panel B in Table 2 provide support for the paper's main prediction: bilingual education mitigates political discrimination against ethnic outgroups. Specifically, the point estimates for *Bilingual Instruction* are negative and statistically significant at the conventional level across all measures of ethnic outgroup political discrimination. For instance, model 1 in Panel B indicates that ethnic Malays who were exogenously assigned to receive bilingual instruction during their secondary school education on average displayed a 0.708 points reduction on the composite index of ethnic outgroup discrimination. This effect is also substantively meaningful as it represents a 1.1 standard deviation decline in *Ethnic Discrimination* (mean = 1.97, sd = 0.64). With regard to the four component measures, bilingual instruction is associated with less ingroup favoritism toward a coethnic political candidate (*Ethnic MP*), as well as lower levels of support for a Malay Prime Minister (*Ethnic PM*), unequal political rights between different ethnic groups in Malaysia (*Ethnic Rights*), and the presence of ethnic parties (*Ethnic Parties*).

Taken together, the results from Table 2 are illustrative of the growing pains of a policy reform that ultimately brought about more inclusive political attitudes among affected

Table 2: **Bilingual Instruction Reduces Ethnic Outgroup Political Discrimination**

Panel A: LATE at January 1, 1990 Cutoff

DV =	Ethnic Discrimination	Coethnic MP	Coethnic PM	Ethnic Rights	Ethnic Party
	(1)	(2)	(3)	(4)	(5)
Bilingual Instruction	−0.095	0.927*	−0.325**	0.279*	−0.490**
	(0.053)	(0.364)	(0.087)	(0.117)	(0.072)
Covariates	Yes	Yes	Yes	Yes	Yes
Cohort FE	No	No	No	No	No
Observations	644	766	586	703	578
Bandwidth	[−566, 566]	[−651, 651]	[−483, 483]	[−615, 615]	[−482, 482]

Panel B: CACE for Full Sample

DV =	Ethnic Discrimination	Coethnic MP	Coethnic PM	Ethnic Rights	Ethnic Party
	(1)	(2)	(3)	(4)	(5)
Bilingual Instruction	−0.708**	−1.445**	−0.651**	−0.789**	−0.450**
	(0.018)	(0.056)	(0.015)	(0.025)	(0.027)
Covariates	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes
Observations	2050	2056	2053	2052	2053

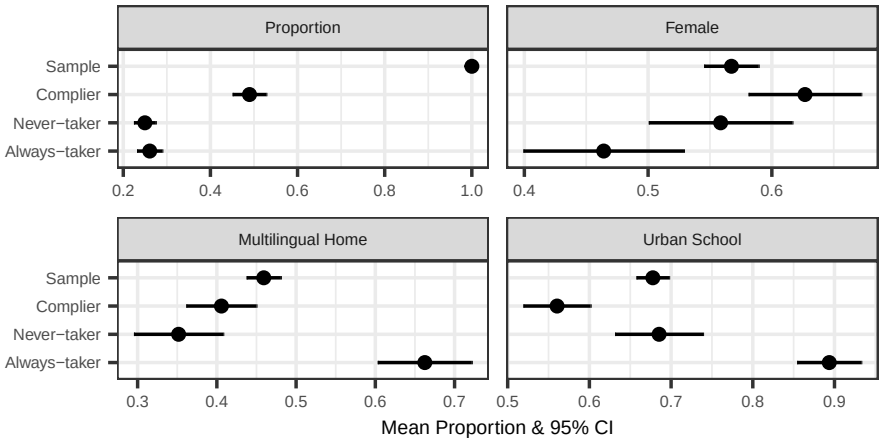
Notes: Table entries are unstandardized coefficient estimates. Robust standard errors clustered by birth year are displayed in parentheses. The values for *Ethnic Discrimination* and *Coethnic MP* range between 0 and 4, and between −9 and 9 respectively. Each of the remaining outcome measure is measured on a 4-point Likert scale. The pretreatment covariates are *Female*, *Multilingual Home*, and *Urban School*. The bandwidth refers to the number of days before and after the cutoff at January 1, 1990, the latter of which is set at zero. Full regression results for Panels A and B are reported in Tables SI3a.5 and SI3a.6 respectively. $^{**}p < .01$; $^{*}p < .05$.

ethnic Malay students. Although the immediate impact of the reform at the cutoff appears mixed (Panel A), the inclusionary effects of bilingual instruction become more apparent as subsequent cohorts of students (as well as parents and teachers) adjust to and acclimate themselves with the new language requirements (Panel B). As such, the rest of the empirical section presents results from the CACE models, given our interest in the overall – and not the immediate – effect of bilingual instruction on ethnic outgroup political discrimination.

Profiling Compliers & Noncompliers in Malaysia Case

How far can we generalize the results from Table 2 to the general population of ethnic Malay individuals who were born between 1985 and 1995? Following Marbach and Hangartner (2020), Figure 3 visualizes the profiles of compliers and noncompliers in the Malaysia survey based on three pretreatment covariates – i.e., *Female*, *Multilingual Home*, and *Urban School*. According to the top left panel in Figure 3, about 50% of the respondents are identified as compliers, 25% are never-takers, and 26.1% are always-takers. With regard to the pretreatment covariates, compliers tend to be females, are less likely to come from families that speak more than one language, and were more likely to attend rural secondary schools. While the main results in Table 2 may not be generalizable to the entire population, the findings from Figure 3 suggest that the reform mainly targeted the subpopulation of ethnic Malay compliers who were *ex ante* least likely to receive proper second language training at home (lower left panel) or at school (lower right panel). This also speaks to the importance of the main results in Table 2, as the findings reflect changes in political attitudes among ethnic Malay participants who would have stayed as monolinguals – and hence might display higher levels of ethnic outgroup political discrimination – if not for the reform in 2003.

Figure 3: **Complier and Noncomplier Profiles Based on Pretreatment Covariates**



Notes: Each point in the plot corresponds to the mean proportion of respondents who are compliers, never-takers, or always-takers in the survey. The horizontal lines are the 95% bootstrapped confidence intervals for each subpopulation.

Robustness Checks

I perform a number of robustness tests to verify the main findings from Panel B in Table 2. A description of the analyses and findings are detailed in Section 4 of the SI. First, to check whether the results are robust to alternative operationalizations of the composite index for ethnic outgroup political discrimination, I implement a "leave-one-out" approach by dropping one component measure from the variable *Ethnic Discrimination* at a time, and regressing the new variable on the same set of instrument, predictor variable, pretreatment covariates and cohort fixed effects. The statistical significance and coefficient signs remain unchanged (Figure SI4a.2). Next, to improve the "representativeness" of the findings, sampling weights are computed based on the 2010 Malaysian census data. I observe similar results even after including the sampling weights into the estimation models (Table SI4b.8).

I also examine the possibility that the reform influenced ethnic outgroup discrimination through alternative channels other than the language of instruction used in schools (i.e., exclusion restriction). One possible violation is that the reform might have induced policy resentment among ethnic Malays who were forced to undergo bilingual instruction in schools. Put differently, it is not the experience of bilingual instruction that motivates discontent toward the second language; rather, resentment may stem from a sense of injustice that previous cohorts of students, as well as ethnic Chinese students from private secondary schools, were exempted from the reform in 2003. This sense of dissatisfaction toward learning and speaking English might in turn influence an individual's inclination to discriminate against ethnic outgroups. I assess the viability of this alternative channel by examining whether the instrument *Reform* has a direct effect on respondents' opinions regarding the use of English in their daily lives (e.g., "Malaysians place too much emphasis on learning and speaking English"). The results show that this alternative channel is not predicted by the reform, thus mitigating the plausibility of this alternative mechanism (Table SI4c.9).

I also analyze the sensitivity of the CACE estimate for *Ethnic Discrimination* by varying

the severity in which the exclusion restriction assumption is violated. Accordingly, the effect of bilingual instruction on the composite index of ethnic outgroup political discrimination would still be statistically significant even if up to 25% of the reduced form effect of the reform had occurred through other unobserved pathways (Table SI4c.10). Given that it is already unlikely that a person's birth date can predict ethnic discrimination without working through the language of instruction path, it is even more improbable that there exists an alternative channel that can exert such a substantial impact that would wipe out the effect of bilingual instruction on ethnic outgroup discrimination.

Bilingual Education Improves English Literacy & Perspective-Taking Ability

This section provides suggestive evidence that the patterns observed above likely stem from improvements in second language proficiency and perspective-taking ability among individuals who received bilingual education in school. Accordingly, one testable implication from the theory is that individuals who received bilingual instruction should report higher levels of second language proficiency than those who received monolingual instruction. A second expectation is that bilingual instruction should promote the development of perspective-taking ability among affected students.

I test the two implications by replacing the outcome variable with *English Proficiency* and *Perspective-Taking* in the instrumental variables regression (or CACE) models.[16] In line with the paper's expectations, the findings from Table 3 suggest that ethnic Malay respondents who were exogenously assigned to bilingual instruction report higher levels of English literacy and display a greater capacity for perspective-taking. In addition, the provision of bilingual instruction had sizeable effects on self-reported English proficiency (mean = 3.87, sd = 0.91) and perspective-taking ability (mean = 4.74, sd = 1.15), amounting to 0.72 and 0.27

[16]Note that the identifying assumptions should still hold even when the outcome variables are changed to *English Proficiency* and *Perspective-Taking*. For instance, it is unlikely that the reform – or birth date – predicts both outcome measures through other alternative channels other than the language of instruction used in schools (exclusion restriction), or that respondents who were supposed to receive English or Malay instruction for STEM subjects chose to do the opposite ("no-defiers" assumption).

of a standard deviation change respectively. As such, the results are consistent with the argument that bilingual instruction mitigates ethnic outgroup discrimination by improving second language proficiency and perspective-taking ability, though they do not represent direct evidence that this relationship is primarily mediated by the two mechanisms.

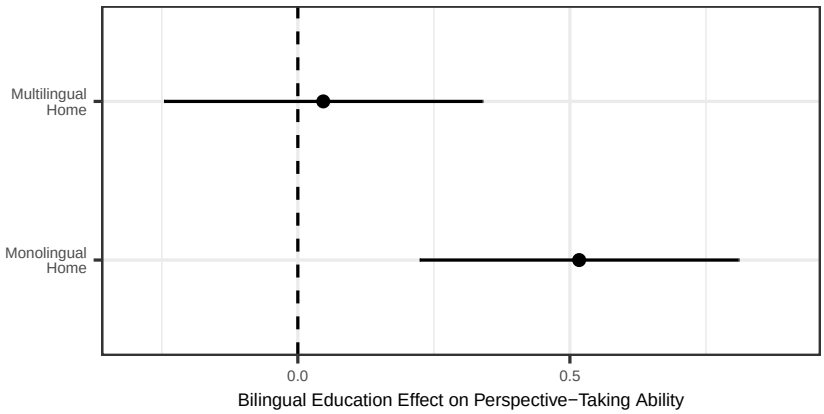
Table 3: **Bilingual Instruction Improves English Literacy & Perspective-Taking**

DV =	English Proficiency	Perspective-Taking
Bilingual Instruction	0.649**	0.310**
	(0.020)	(0.025)
Covariates	Yes	Yes
Cohort FE	Yes	Yes
Observations	2063	2038

Notes: Table entries are unstandardized coefficient estimates. Robust standard errors clustered by birth year are displayed in parentheses. *English Proficiency* is measured on a 5-point Likert scale, where larger values reflect higher levels of self-reported English fluency. The values for *Perspective-Taking* range between 0 and 7, and it is computed by taking the sum of normalized responses to the perspective-taking sub-scale items from the IRI (Davis, 1983). Larger values reflect higher perspective-taking ability. The pretreatment covariates are *Female*, *Multilingual Home*, and *Urban School*. Full regression results are reported in Table SI5a.11. $^{**}p < 0.01$; $^{*}p < 0.05$.

Next, I consider the plausibility of the compensation hypothesis. If bilingual education is responsible for the development of perspective-taking ability, then there should not be any discernible change in perspective-taking capacity for those who come from multilingual families. For these individuals, linguistic diversity at home implies a higher rate of language switching, thereby facilitating the cognitive development of perspective-taking. Consequently, the effect of bilingual instruction should be smaller for them. On the other hand, while individuals from monolingual backgrounds might not receive sufficient second language training at home, bilingual instruction may offer a compensatory avenue for this group of students by exposing them to two different languages in their classrooms while cultivating their perspective-taking ability. Hence the impact of bilingual instruction should be substantively larger for affected individuals who were raised in monolingual homes.

Figure 4: **Marginal Effects of Bilingual Education on Perspective-Taking Ability, Conditional on Linguistic Context at Home**



Notes: Each point represents the marginal effect of *Bilingual Instruction* on perspective-taking ability, conditional on whether respondents speak more than one language at home. Each horizontal line is the 95% confidence interval of the point estimate (i.e., cluster-robust standard errors by birth year). The pretreatment covariates are *Female*, *Multilingual Home*, *Urban School*, and cohort fixed effects. Full regression results are reported in Table SI5a.11.

To test this conjecture, I interact the predictor variable with *Multilingual Home*. Figure 4 presents the marginal effects of bilingual instruction on perspective-taking ability, conditional on respondents' linguistic diversity at home. Consistent with the compensation hypothesis, there is a significant and positive association between bilingual instruction and perspective-taking ability among individuals who only speak one language at home. In contrast, this effect is statistically indistinguishable from zero for respondents who come from multilingual families. The results from Figure 4 however should be interpreted as suggestive, since an ideal test of the compensation hypothesis should take the form of a longitudinal study that tracks changes in perspective-taking ability before and after exposure to bilingual instruction and whether the intervention has helped to narrow the perspective-taking gap between students who come from monolingual and multilingual families (see Neundorf et al., 2016).

Alternative Explanations

I consider three potential alternative explanations for the main findings. Unless specified otherwise, detailed descriptions and results of these additional tests are presented in SI

section 6. The first set of alternative explanations relate to the bundle of posttreatment covariates that were omitted from the baseline CACE specifications such as highest education qualification and employment status. For instance, exposure to English instruction in schools may expand the range of higher education avenues (e.g., local and foreign universities) or employment opportunities (e.g., jobs that require English fluency) among affected ethnic Malay individuals. It is therefore possible that these socioeconomic mechanisms may mediate the extent in which bilingual instruction affects ethnic outgroup political discrimination. I account for this concern by including a broader set of social and economic controls in the CACE models. The same key findings are obtained after accounting for respondents' highest education qualification, marital status, income, and employment situation (Table SI6a.12).

Another alternative explanation to the main findings is that bilingual instruction may facilitate inter-ethnic contact by providing a common linguistic medium for members of different ethnic groups to communicate with each other, thereby resulting in more positive evaluations of outgroup members (Wright and Bougie, 2007; Wright and Tropp, 2005). It is also possible that these interactions may induce greater perspective-taking among individuals who were affected by the education reform. To assuage these concerns, the survey also asked participants to indicate the frequency in which they engage in informal conversations with members of a different ethnicity (*Contact Quantity*) as well as the quality of their interactions (*Contact Quality*). I then regress both outcome measures on the predictor, with *Reform* as the instrumental variable. I find that bilingual instruction fails to predict both measures of inter-ethnic contact (Table SI6b.13), thereby suggesting that the relationship between bilingual education and ethnic outgroup political discrimination should not be mediated by the frequency or quality of intergroup contact between ethnic Malays and other minority groups in Malaysia.

Lastly, another interpretation of the findings is that the observed patterns may be a consequence of using English as a language of instruction in schools, as opposed to the more general expectation that bilingual instruction promotes politically inclusive ethnic attitudes.

Are the results driven by the effects of bilingual instruction or English instruction? For instance, the main findings may be a reflection of the suggestion that learning and speaking English is perhaps associated with more cosmopolitan attitudes given its status as a lingua franca in many inter-cultural and global settings, hence upward biasing the model estimates. Unfortunately, it is empirically difficult to identify and isolate the impact of English instruction from the observed effects of bilingual instruction in the Malaysia case, given the absence of a counterfactual condition where students were randomly assigned to a second non-English language of instruction in school thereby allowing us to test the robustness of the results by comparing across different language of instruction regimes.

I consider two additional – albeit imperfect – tests to placate this concern. If the results were primarily influenced by the effects of English instruction as opposed to bilingual instruction, then we could make the parallel argument that English-speaking bilinguals should exhibit lower levels of political discrimination against ethnic outgroups than non-English-speaking bilinguals. Table SI6c.14 reports the results from a series of models where the outcome measures of ethnic discrimination are regressed on a binary indicator of whether a respondent speaks English among a subset of bilingual speakers.[17] Accordingly, variations in ethnic discrimination cannot be explained by whether the second language spoken by a bilingual respondent is English or not. This observation is also consistent with the theoretical claim that there should not be any meaningful difference in ethnic attitudes between bilinguals who, for instance, speak an ethnic minority tongue and those who are fluent in a colonial language. Next, I compare between bilinguals and monolinguals within a subset of non-English-speaking respondents to ascertain whether the effects of bilingualism hold even if the second language spoken by a bilingual respondent is not English. Most of the coefficient estimates are negatively signed and are statistically significant at $p < 0.1$, thereby suggesting that bilingualism – regardless of whether the second language is English or not – is related to less ethnic outgroup discrimination (Table SI6c.15). Admittedly, the tests are

[17]The survey also asked participants to list all the languages that they speak outside their homes. As such, I measure bilingualism based on whether a respondent speaks more than one language at home or outside.

not ideal, especially in light of the fact that the proportion of non-English-speaking ethnic Malay bilinguals in the survey sample is relatively small. As such, the results may be an artefact of the under-powered nature of the two tests.

Conclusion

In this article, I show that individual variations in ethnic outgroup attitudes can be traced back to an individual's language training in school. Specifically, I demonstrate the effects of bilingual education on ethnic outgroup political discrimination by leveraging the as-if random assignment of the type of language of instruction used in Malaysian secondary schools due to the sudden implementation of an education reform in 2003. The main analysis demonstrates that ethnic Malay individuals who received bilingual instruction on average displayed less ethnic outgroup political discrimination. These effects are also robust across different operationalizations of the outcome variable, different tests of the exclusion restriction assumption, and the inclusion of sampling weights. In addition, while the evidence suggests that the immediate impact of the language reform appears mixed among the cohorts of students who were born just before or after the cutoff date, the inclusionary effects of bilingual education become more conspicuous as affected students adapt to the new curriculum requirements. When examining the profile of compliers, I also find that the reform mainly targeted the subpopulation of ethnic Malay individuals who were *ex ante* least likely to receive adequate second language training at home or at school, and hence would benefit immensely from the education reform both in terms of their second language proficiency and perspective-taking ability. Indeed, I provide suggestive evidence that the relationship between bilingual instruction and ethnic discrimination might be mediated by these two mechanisms. In particular, the findings allude to the possibility of bilingual education as a compensatory avenue through which the *ex ante* perspective-taking disparity between individuals who come from monolingual and bilingual families may be mitigated. Finally, I rule out alternative explanations

such as cross-ethnic contact, posttreatment covariates, and whether the observed findings stemmed from the effect of English instruction as opposed to bilingual education.

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