Investigating Peer Effects on Student Choices to Continue Foreign Language Enrollment*

Hoyun Kim

Faculty Advisor: Christopher Walters
Undergraduate Department of Economics
University of California, Berkeley
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Abstract

In light of globalization, multilingualism has been touted as a valuable and desirable skill for the job market. This paper analyzes how peer effects influence college course outcomes, namely, the decision to continue taking foreign language classes after a student's first quarter in college. Using a reduced form regression model, I find that the proportion of ethnically native students and the proportion of female students in a student's introductory foreign language class have a significant impact on that student's tendency to take more foreign language classes than are required of them. Increases in proportion of enrolled females in a class appear to negatively impact any student's tendency to take extra Japanese classes, especially males, while ethnically native students negatively impact a Hispanic student's tendency to take extra Spanish classes.

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In a time when technological advancements have only made the world smaller through social media and cross-cultural exchange, fluency in multiple languages has become much more valued. Foreign language studies is compulsory as early as primary school in most European and Asian countries,[1] with many requiring even two or more foreign languages[2]. On the other hand, only a handful of states in the United States have initiated foreign language requirements for high school graduation[3] despite a slow increasing trend as depicted in figure 2. In contrast to the United States' meager promotion of foreign languages in secondary education, most undergraduate college programs in the United States have foreign language requirements for graduation. Even in the University of California system, two of the UCs require proof of foreign language proficiency outside of high school transcripts, five require foreign language proficiency which can be waived with high school transcripts, and two either require or strongly recommend foreign language proficiency depending on the different college within the university.[4] According to Altonji, Arcidiacono, and Maurel (2016), one's major choice does impact one's future outcomes such as wage. The classes students take inside and outside of that major will also end up impacting future outcomes, and modern education seems to promote multilingualism as one of those assets that are going to be profitable for the individual. Then the question remains: How can students be encouraged to continue pursuing study of foreign languages outside of being forced with requirements, especially since the climate of the US primary education system does not seem to be as supportive as its post-secondary counterpart?

As Sacerdote (2011) assesses in his paper, the existing literature on peer effects are relatively ambiguous accross all levels of education. Angrist (2014) posits that this is due to potential mechanical biases outside of selection bias and the fact that it is impossible to distinguish between the effect of peers on an individual and the effect of the individual on peers. Nonetheless, we know that one's peers do indeed impact the student, especially in their academic performance within the specific class and beyond. Carrell, Fullerton, and West (2009), for example, find that academic peer effects of students in the same US Airforce Academy cohort positively impact student academic

[1]Devlin, Kat. "Learning a Foreign Language a 'must' in Europe, Not so in America." Pew Research Center. July 13, 2015. Accessed October 10, 2018. http://www.pewresearch.org/fact-tank/2015/07/13/learning-a-foreign-language-a-must-in-europe-not-so-in-america/.

[2]See figure 1

[3]Dounay, Jennifer. "High School Graduation Requirements: Foreign Language." Education Commission of the States. March 23, 2007. Accessed October 10, 2018. http://ecs.force.com/mbdata/mbquest3NE?rep=HS11.

[4]http://admission.universityofcalifornia.edu/counselors/graduation-requirements/language/index.html

achievement. Lyle (2009) puts forward similar findings with student cohorts at West Point, finding that more heterogenous peer groups have positive effects on academic outcomes and high-achieving students positively impact the academic outcomes of the cohort as a whole. Feld and Zölitz (2017) find opposite results and concludes low-achieving students are actually academically hurt by their high-acheiving peers. Hoxby (2000) finds in her study of child classroom environments that although peer effects may be small, they tend to be stronger both positively and negatively intra-race.

Unlike the abundance of research on peer effects of academic achievement, we do not have as much information regarding the impact peers make on students' decisions for the future. One instance in which student choices are considered alongside student academic performance is in Sacerdote (2001)'s study on Dartmouth students and their interactions with roommates and floormates. Sacerdote concludes roommates influence GPA and membership of fraternities, but not what students choose to study. A criticism of this paper is that the roommates were not perfectly assigned randomly but only randomly within particular clusters of students. In consideration of this criticism, I measure the influence peers have on what students choose to study with an alternate source of randomness. Acknowledging international efforts to encourage foreign language acquisition, I study what motivates students who have had their first exposure to a foreign language in college to decide to continue their studies beyond what is required of them; in particular, I evaluate whether peers' characteristics impact these personal decisions to pursue further study of a foreign language. Instead of merely focusing on immediate results in a student's performance through GPA, I consider how peers affect student motivation and interest to the point that they would impact a student's decisions in coursework. Empirically, the approach I use is similar in using the cohort method in which students are divided into to observe peer effects. However, I also consider a wider variety of peer effects through randomization of both ethnicity and gender and take advantage of randomness of student sections and the strong level of interaction between students from the nature of foreign language classes.

This study uses a similar idea to that of Feld and Zölitz (2017) by taking advantage of small class environments within the University of California, Davis. I use course and student data of the years 1993 to 2016 from UC Davis to see whether the ethnicity of the students in one's class motivates or discourages a student from continuing their studies in a foreign language. I define ethnically native student as those whose ethnicity is the corresponding ethnicity of the foreign language they

register to take. For example, students who identify as Chinese are ethnically native to the Chinese language, regardless of their fluency in the language. My population consists of people who take their first semester of Chinese, Japanese, or Spanish during their first quarter of college, and the first course they take is the introductory level course of that language. (Chinese 001, Japanese 001, Spanish 001) By observing foreign language classes in particular, I take advantage of the particular nature of language classes; that they are small in size (an average of 25 people per section and the largest section being 39 people), are frequent (five days a week), and involve large amounts of speaking and collaboration on projects with classmates. The time you spend with your peers in your introductory foreign language class is effectively greater than any other social circle you will be a part of during the first quarter of college when you have yet to establish social connections outside of a classroom environment. Because of greater amount of time and interaction between classmates in foreign language classes compared to that of the average lecture at a large university, I can estimate peer effects comparable to those of larger classes where interaction among students is more varied and harder to precisely isolate.

The results prove to be significant: for every 10 percent increase in proportion of ethnically native students in a class, students in Chinese classes are estimated to be 5.3 percent more likely to take extra Chinese classes, and Hispanic students in Spanish classes are estimated to be roughly 15 percent less likely to take extra Spanish classes. The negative impact observed in Spanish classes may be the consequence of people refraining to take courses that appear to have native speakers or people with a cultural advantage. This would also be a story that goes against the observation of Hallinan and Smith (1989) that groups with more of a particular ethnicity will have cliques of that ethnicity that are stronger. For every 10 percent increase in proportion of females in a class, students in Japanese classes are 4.4 percent less likely to take extra Japanese classes. To provide coherent explanations for these coefficients, I also regress the outcome of whether or not a student decides to take the course with a Pass/No Pass grading option on the same specified variables, and regress the GPA received in the course on the same variables.

The remainder of this paper is as follows: Section 1 further illustrates the context from which the data of this study comes from, Section 2 discusses the characteristics of the data in this study, Section 3 covers the empirical specifications of the model used, such as the rationale behind my reduced-form regression model. Section 4 summarizes the empirical results, and Section 5 concludes with

final remarks.

1 Background

As aforementioned, the University of California has defined foreign language requirements for the receipt of a A.B or B.S. degree. Of the UCs, Davis is one of the most stringent because they do no accept high school transcript records as sufficient for entirely waiving out of the foreign language requirement. Instead, one must take a placement test to prove proficiency of or take classes totaling 15 quarter units of one foreign language. Two or three years of a foreign language in high school is only enough to receive credit for the first 5 units of the corresponding foreign language (Course Number 001).

According to the UC Davis Degree Requirement website, "Language learning enables students to communicate effectively in an increasingly internationalized world, enhances their ability to understand ways of thinking different from their own, gives them direct access to cultural production from another time and place, awakens in them an awareness of the conditioned nature of their assumptions about the world, and trains them to cope more effectively with intellectual and practical problems they may face in their future careers."[5] The campus' rationale for their policy regarding foreign language requirements therefore derives from the belief that learning a foreign language will be beneficial to people in the workforce.

As shown by Figure 3, UC Davis is experiencing increasing diversity of non-native speakers for each foreign language class they offer. We also observe in Figure 4 class size has a decreasing trend with the exception of Japanese, and all three language courses have been offering an increasing number of sections to enroll in. Figure 4 may ultimately be a reflection of the increasing student body of Davis over the years, but through Figure 3 we can see that as the student body grows, those taking the beginner level foreign language class are becoming more diverse.

[5] https://lettersandscience.ucdavis.edu/degree-requirements

2 Data

The data consist of student-class combinations (i.e. there are multiple observations for each student for each class they have taken in college) from the University of California, Davis from the year 1992 to 2018, available through the University of California Clio-Metric History Project under director Zachary Bleemer. Each of these observations have variables such as anonymized student ID, course department, course number, course name, grade received in course, year of class taken, term of class taken, student start year, major, gender, etc. Of these observations, I use the classes pertaining to the Chinese, Japanese, and Spanish department for this study. These three languages are the only languages that have a corresponding student ethnicity that is observable: Chinese, Japanese, Hispanic respectively. For those students whose ethnicity is unknown due to missing data, they are considered as having no ethnicity when calculating classroom ethnic makeup (neither native nor non-native) and are taken out of the total pool of observations when regressions are run. Out of 213670 total observations in the three language departments, however, only 10130 are marked as unknown, which is roughly 4.7 percent of observations.

I restrict my observations to only students who begin foreign language study from the introductory level (i.e. Chinese 001, Japanese 001, and Spanish 001). This filters out students who are already relatively familiar with the language from factors outside of the college environment that cannot be controlled for in this study (for example, through having spoken the language at home with parents) due to the required placement tests when enrolling in a foreign language class at UC Davis. Therefore all observed students, regardless of ethnicity, will be beginner-level learners of the language when they take their first foreign language class in college.

I also only look at students who are in their first year of enrollment when they begin taking the language classes to ensure there are no students I am observing who decide to take a language class in their final semester of college just for fun. Otherwise, these students would be counted as those who are discouraged from pursuing the foreign language further. By looking at students in their first year of enrollment, I also limit the effect of unobservable influences students receive to varying degrees over their time in college, such as the impacts from clubs or friend groups. Restricting my observations as described, I am left with 458 Chinese, 1244 Japanese, and 835 Spanish observations ranging from the years 1993 to 2016.

Utilizing the variables I have at hand, I also create my own variables such as proportion of

ethnically native students in your class section (EthNatPeerRatio), proportion of female students in your class section (PeerFem), the number of classes each student takes of the corresponding foreign language (EthNatCourseCount), and dummy variables for being ethnically native (EthNatYN) and being female (Fem).

3 Methodology

Unlike the peer-effects studies by Carrell, Fullerton, and West (2009), and Lyle (2009) which are both conducted on very small and particular colleges (United States Air Force Academy and United States Military Academy, respectively), my results are more generalizable because they concern a large public university. However, I still observe the small and intimate "cohort" effects the papers emphasize by using a similar environment - the section setting of language classes. Hoxby (2000) measures peer effects on academic performance while taking into consideration gender and ethnicity, which is what the study by Carrel, Fullerton, and West fail to do because the cohorts they observe are intentionally made as diverse as possible in terms of race and ethnicity. However, the population Hoxby uses runs into issues of randomness because they are high school students whose peers were partially controlled through parental choice to enroll their children in particular schools and particular classes to ensure high academic performance. In contrast, I use the proportion of ethnically native students in a class section as my source of random variation. The utilization of class section is an approach similar to that of Feld and Zölitz (2017) as they take advantage of the fact that the students they observe are randomly assigned to sections of 10 to 15 students for every class that they are enrolled, in which they spend most of their hours together in a classroom.

I run reduced-form regressions, regressing the indicator of whether or not a student takes more than 3 foreign language courses (denoted "Extra" in the regression tables) on proportion of ethnically native students in a student's introductory-level foreign language class (EthNatPeerRatio), whether the student is ethnically native (EthNatYN), proportion of females in the class (PeerFem), whether the student is female (Fem), and the interaction terms for the variables regarding ethnicity and gender. I also include year fixed effects and use clustered standard errors for the number of the section you are in (e.g. 001, 002, etc.) The clustered standard errors are incorporated using the $felm()$ fuction in the lfe package in R.

Proportion of ethnically native students and proportion of enrolled females in a class are viable instruments and will yield credible estimates for peer effects because when registering for classes, students do not have any information on how many people with each ethnic/gender trait will be present in their foreign language class. Thus, we eliminate selection bias; when students register for a section, they are relatively randomly being assigned to how many of each kind of peers they will have. This is especially the case for students who are just entering college and lack prior knowledge regarding what classes will be like and prior connections with friends to take classes with. The time at which the sections are held may be a topic of concern because this is not random and something students can intentionally choose but the variety in choices students have are very minimal considering the times students pick for classes are restricted by other courses they must take. Because course sections are numbered in order of start time (e.g. Section 001 is hosted at 9am, Section 002 is hosted at 10am, and so on) Section 001 will always be held before or at the same time as Section 002. Therefore, I am also able to control for time at which the course is administered by adding fixed effects for section number.

Through my argument that proportion of ethnically native students in a language class is randomly assigned, I infer causation from correlation. The equation is as follows:

$$Y_{itc} = \alpha + \delta_t + \beta_1 E_i + \beta_2 EP_{itc} + \beta_3 E_i * EP_{itc} + \beta_4 F_i + \beta_5 FP_{itc} + \beta_6 F_i * FP_{itc} + \epsilon_{itc} \quad (1)$$

Y_{itc} is an outcome for student i who takes their introductory foreign language class during their first quarter in UC Davis in year t and is enrolled in section c. The outcomes of interest are the main outcome of whether or not a student takes more than the required amount of foreign language classes (denoted "Extra" in the regression tables) and the outcomes of whether or not a student chooses not to receive a letter grade for the class (PNP) and the letter grade the student earns in the class (GPA). δ_t is fixed effects for the year the course was taken. E_i is an indicator for whether or not the student is ethnically native to the foreign language course they are enrolled in. EP_{itc} is a value between 0 and 1 for proportion of ethnically native peers in the class. This value when calculated does not include the student's ethnicity and only that of their peers. Therefore, the value differs across students in the same section during the same year depending on whether or not they themselves are ethnically native. F_i is an indicator for whether or not the student is female. FP_{itc} is a value between

0 and 1 for proportion of female peers in the class, calculated in the same "take one out" manner as the proportion of ethnically native peers is calculated. I include the interaction terms as variables because I anticipate different or even opposite effects of the proportion of ethnically native students and proportion of female students depending on the students' own characteristics. For example, an increase in ethnically native students may positively influence fellow ethnically native students to take extra foreign language classes while negatively influence students who are not ethnically native because there is a sense of community and encouragement formed among the students who possess similar traits.

4 Results

4.1 Main Results

The results of the primary regressions are shown in column (1) of Table 1, Table 2, and Table 3. I find that the coefficients pertaining to the proportion of peer characteristics in a language class are the most statistically significant. The proportion of Chinese peers is significant for Chinese classes, the proportion of enrolled females is significant for Japanese classes, and the proportion of Hispanic peers is significant for the Hispanic students in Spanish classes.

As mentioned prior, to provide explanations for these coefficients, I also regress the outcome of whether or not a student decides to take the course with a Pass/No Pass grading option on the same specified variables, and regress the GPA received in the course on the same variables, which correspond to column (2) and column (3), respectively.

For introductory Chinese classes, there is no clear correlation between whether or not a student takes the class as a letter grade and the specified variables used for this study, and the same applies to student GPA in the class. The coefficient for proportion of ethnically native peers in column (1) is also just barely at the 95 percent significance level. For every 10 percent increase in Chinese students in an introductory Chinese class, all students would on average be expected to be 5.3 percent more likely to take more than 3 Chinese language classes during their time in college. A potential explanation for the significance of this positive variable could have been the positive effect high-performing students bring to a class as a whole as described in Carrell, Fullerton, and West (2009) and Lyle (2009), but this would require a positive coefficient in column (3) for the indicator of

whether or not one is Chinese and the proportion of ethnically native (Chinese) students. In reality, we observe one which is almost 0 for the indicator and one that is negative for the proportion of Chinese students. Both coefficients are statistically insignificant, however, and strong conclusions are difficult to draw. Another consideration for the ambiguity of these results is the significantly small number of observations. 458 observations across 23 years is only roughly 20 observations of freshmen per year, and so there is want of more data for greater accuracy.

For introductory Japanese classes in Table 2, we see in column (3) that the coefficient for whether or not a student is female is significant at a 95 percent level with a value of 0.525. This means that females are on average expected to receive a 0.525 GPA higher than their male counterparts, which is roughly half a letter grade. This can explain the negative coefficient in column (1) that says for every 10 percent increase in percentage of females in an introductory Japanese class, males are 4.4 percent less likely to take extra Japanese classes while females will receive roughly no effect. Because there is a tendency for females to receive higher grades, when the proportion of females in a class increases, males will be discouraged from continuing studies in the foreign language.

For introductory Spanish classes in Table 3, we see in column (3) that the coefficient for the interaction term between the Hispanic indicator and proportion of Hispanic students is negative and significant at the 10 percent level. For every 10 percent increase in the percentage of Hispanic students in an introductory Spanish class, Hispanic students on average are expected to receive a 0.32 lower GPA, which roughly corresponds to half a letter grade. Similar to the phenomenon in Japanese classes with gender, it is possible the ethnicity interaction coefficient in column (1) is a consequence of what happens to student GPA. For some reason, when there are more Hispanic students in an introductory Spanish class, only Hispanic students are expected to get a lowered grade. On the other hand, the coefficient in column (3) for the proportion of Hispanic students is 0.589. This means that non-Hispanic students receive a positive influence in their grade when there is a higher percentage of Hispanic students in the class. Although statistically insignificant, the coefficient is still positive, and these numbers illustrate having different peers in a class appears to affect people differently depending on what characteristics the students possess themselves. A potential story could be that Hispanic students decrease each other's grades because they are a distraction to each other, which might explain why non-Hispanic students are not very influenced. An alternative story is that instructors are assessing Hispanic students on a different standard, so

when there are more Hispanic students that perform average or well, the Hispanic students who underperform appear particularly underperforming and so receive a negative influence to their grade. Also worth considering, however, is that in column (3), the coefficient for the Hispanic indicator is 0.324. Combined with the effect Hispanic students receive from having more Hispanic peers in their Spanish class, the effect is roughly zero.

4.2 Robustness

To check for robustness of the variables I use in my original model, I add specifications for other ethnicities, not just whether or not you are ethnically native. I also include number of freshmen in the class (FroshCount) because it could be that having people of the same age group influences a student's impression of foreign language classes.

In Table 4, column (1) includes extra specifications for testing robustness for the regression regarding what impacts students to take extra Chinese classes. The variable for proportion of Chinese students in a Chinese class is no longer significant, but the coefficient is still within the two standard error threshold of the original coefficient, so one cannot rule out that an increase in Chinese students in introductory Chinese classes has a positive effect at the 95 percent significance level. The additional specifications seem to be taking away significant variance that the original variables would otherwise pick up. In Table 4, column (2) includes the additional specifications for testing robustness for the regression regarding what impacts students to take extra Japanese classes. The variable for proportion of Female students remains significant and and relatively unchanged (-0.447). The same is also the case for the coefficient for the interaction term between whether or not a student is Hispanic and the proportion of Hispanic students in a Spanish class, as seen in column (3). In column (3) we also see that for every 10 percent increase in percentage of Hispanic students in an introductory Hispanic class, non-Hispanic students are 5.9 percent more likely to take extra Spanish classes. This finding is congruent to the previous story of how having more Hispanic students in a non-Hispanic student's first Spanish class encourages them to both perform better and find more interest in the material.

5 Conclusion

Overall, the results of my study show to be consistent with that of Hoxby (2000) in that the influence of peers' ethnicity makes real impacts on students and that besides one's own ethnicity or an individual peer's ethnicity, the makeup of the class as a whole also has influence over a student. I also build upon the relatively scarce literature there is regarding behavioral or sociological manifestations of peer effects, as the vast majority of studies regarding peer effects are focused on measuring influence on grades and other performance-based outcomes. Using proportion of ethnically native students and proportion of enrolled females in one's first foreign language class as variables of interest and controlling for other characteristics of individual students and the class they are enrolled in, I find that a higher percentage of Chinese students in an introductory Chinese class will likely encourage non-Chinese students to take extra Chinese classes and a relatively neutral effect for Chinese students. A higher proportion of females in Japanese classes has a significant impact in discouraging male students to take extra Japanese classes, but almost no effect on females. A higher proportion of Hispanic students in an introductory Spanish class will likely discourage fellow Hispanic students from taking extra Spanish classes and also negatively impact grades while have the exact opposite effect for non-Hispanic students. In sum, peer effects are significant and we can conclude that the way peers effect students are also dependent on the characteristics of the student, and so different groups of people are influenced in different ways.

By using larger pools of data from multiple numbers of colleges, future research could include establishing proportion of ethnically native students in one's language classes as an instrumental variable for the number of foreign language classes taken, and then regressing on future income to determine whether current societal attention on the ability to speak more than one language could be attributed a monetary value. Other course sections in college that have small size, high frequency or time duration and collaboration requirements akin to foreign language classes could be used as an instrument outside of the foreign-language class environment. For example, lab classes in the chemistry and biology courses. The characteristics of peers in these courses could then be used to study student major choices in college. One would be able to better understand the impact of a specific college degree on an individual's life and consider what policies could be implemented to prevent students from being discouraged from pursuing a field, or what measures could be taken to encourage students to personally choose pursuing a particular study.

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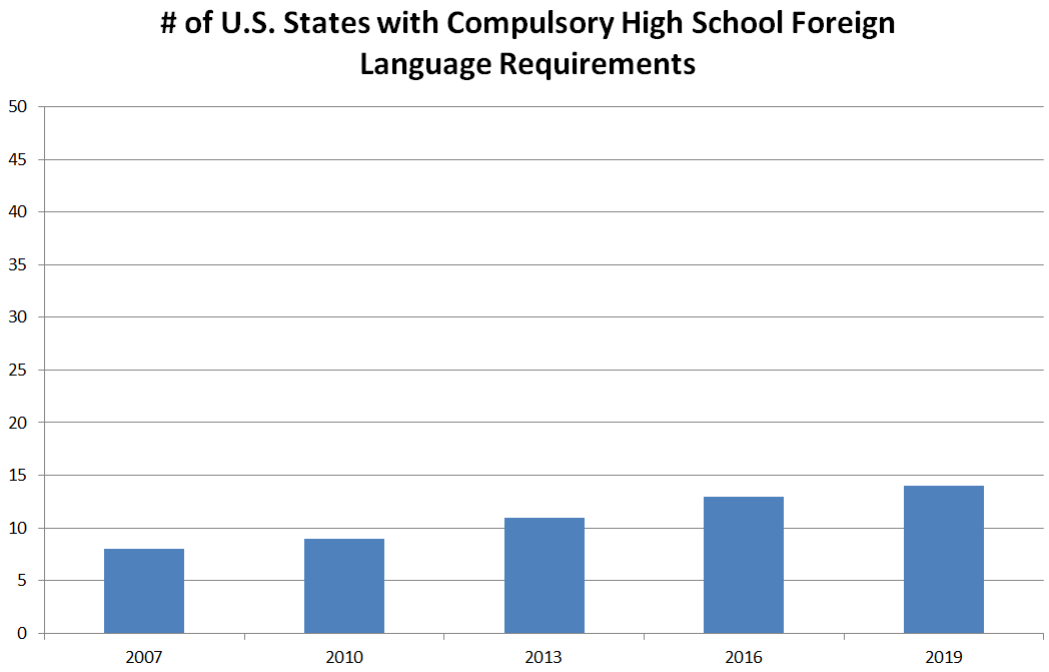
Figure 1

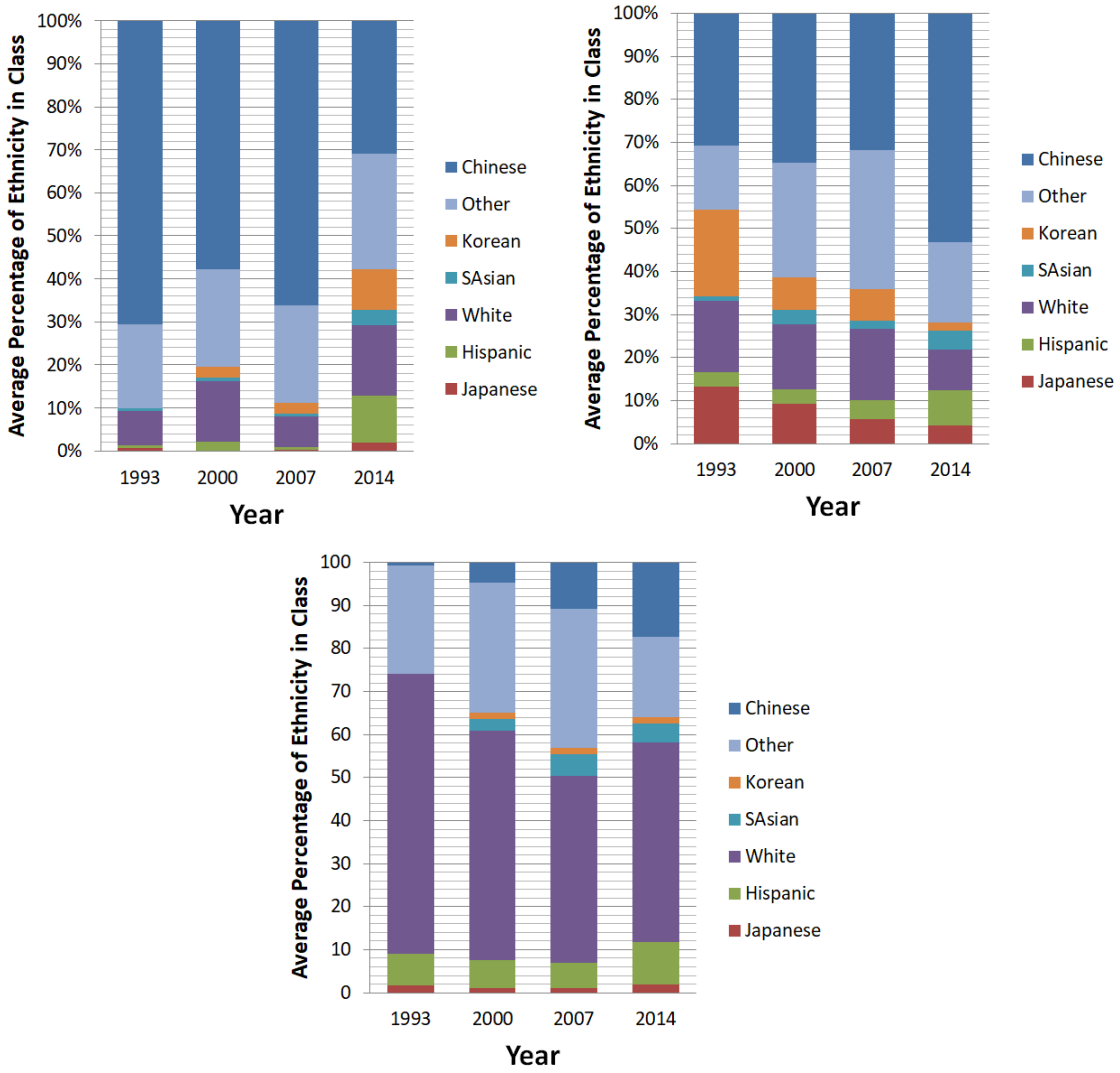
Note: Image from https://www.pewresearch.org/fact-tank/2015/07/13/learning-a-foreign-language-a-must-in-europe-not-so-in-america/

Figure 2



Note: Information compiled from http://ecs.force.com/mbdata/mbquest3NE?rep=HS11

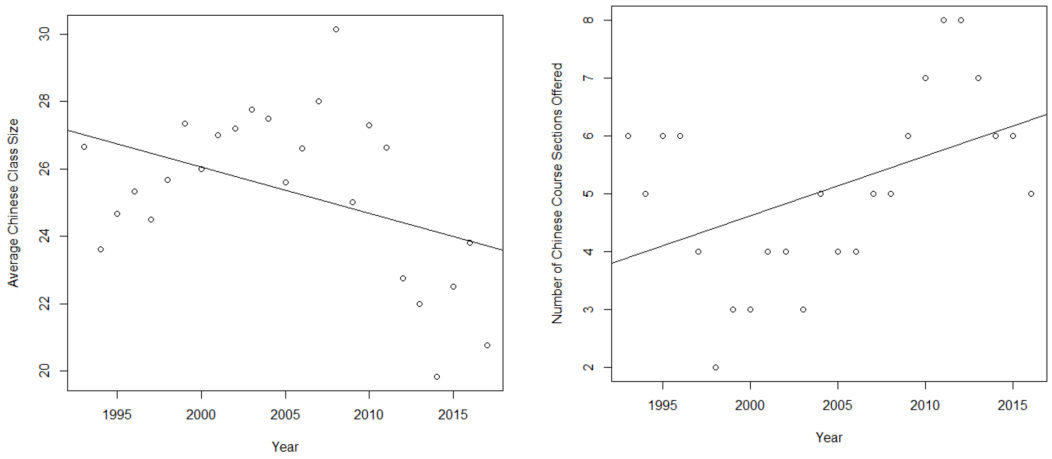
Figure 3: Ethnic Make-up of Classes



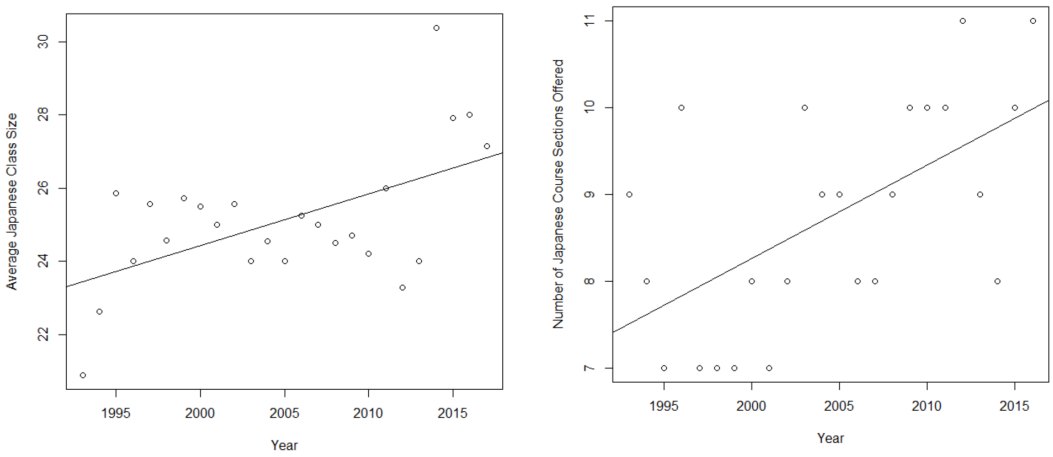
Note: Chinese (left), Japanese (right), Spanish (bottom). Proportion of Black peers is omitted due to lack of observations.

Figure 4: Time Trend of Average 001 Fall Term Class Size by Language Department (left) and Number of Class Sections (right)

(a) Chinese



(b) Japanese



(c) Spanish

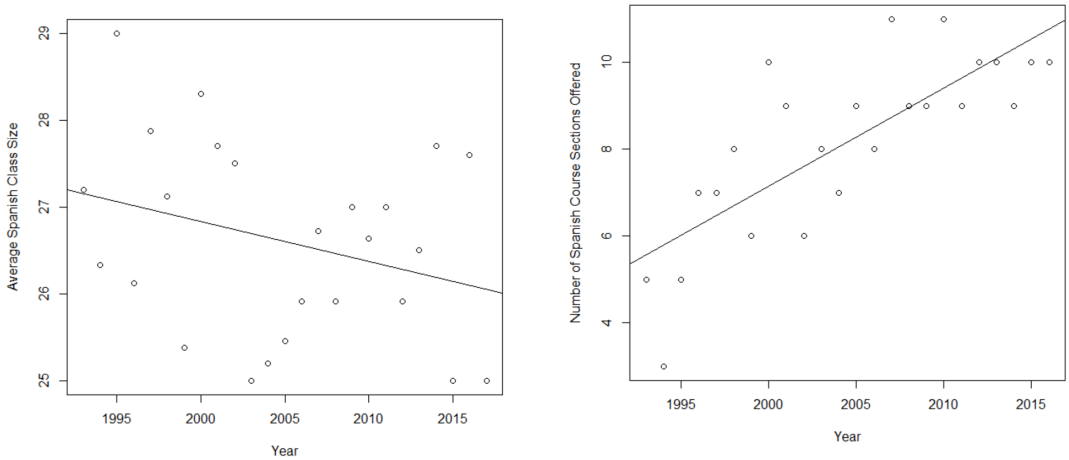


Table 1: Chinese

	Dependent variable:		
	ChinExtra (1)	PNP (2)	GPA (3)
ChinYN	0.220	0.079	0.034
	(0.188)	(0.124)	(0.257)
EthNatPeerRatio	0.532**	0.038	−0.171
	(0.264)	(0.173)	(0.456)
Fem	0.045	−0.009	0.272
	(0.261)	(0.187)	(0.364)
PeerFem	0.015	−0.235	0.120
	(0.371)	(0.233)	(0.503)
ChinYN:EthNatPeerRatio	−0.360	−0.244	0.477
	(0.308)	(0.201)	(0.449)
Fem:PeerFem	0.125	−0.071	−0.020
	(0.482)	(0.324)	(0.697)
Year Fixed Effects	Yes	Yes	Yes
Observations	458	458	400
R^2	0.103	0.090	0.163
Adjusted R^2	0.042	0.028	0.098
Residual Std. Error	0.480 (df = 428)	0.328 (df = 428)	0.703 (df = 370)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 2: Japanese

	Dependent variable:		
	JapnExtra (1)	PNP (2)	GPA (3)
JapnYN	0.110	−0.017	0.152
	(0.087)	(0.054)	(0.137)
EthNatPeerRatio	0.151	0.192	0.260
	(0.194)	(0.161)	(0.340)
Fem	−0.151	−0.024	0.525**
	(0.134)	(0.080)	(0.253)
PeerFem	−0.442**	−0.042	0.222
	(0.216)	(0.122)	(0.384)
JapnYN:EthNatPeerRatio	0.272	−0.235	−0.457
	(0.806)	(0.353)	(0.812)
Fem:PeerFem	0.389	−0.065	−0.606
	(0.250)	(0.142)	(0.474)
Year Fixed Effects	Yes	Yes	Yes
Observations	1,244	1,244	1,083
R^2	0.057	0.047	0.055
Adjusted R^2	0.035	0.024	0.029
Residual Std. Error	0.489 (df = 1214)	0.332 (df = 1214)	0.836 (df = 1053)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 3: Spanish

	Dependent variable:		
	SpanExtra (1)	PNP (2)	GPA (3)
SpanYN	0.238***	0.182**	0.324
	(0.092)	(0.084)	(0.325)
EthNatPeerRatio	0.408	0.375	0.589
	(0.249)	(0.282)	(0.920)
Fem	0.058	−0.340	0.221
	(0.192)	(0.225)	(0.722)
PeerFem	−0.075	−0.165	−1.672
	(0.232)	(0.291)	(1.025)
SpanYN:EthNatPeerRatio	−1.929***	−1.013	−3.222*
	(0.626)	(0.810)	(1.689)
Fem:PeerFem	−0.116	0.471	−0.167
	(0.312)	(0.366)	(1.153)
Year Fixed Effects	Yes	Yes	Yes
Observations	835	835	268
R^2	0.061	0.084	0.173
Adjusted R^2	0.027	0.051	0.073
Residual Std. Error	0.403 (df = 805)	0.455 (df = 805)	0.766 (df = 238)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: Robustness - Main Regression with Controls for Number of Freshmen and Proportion of Other Ethnicity Students

	Dependent variable:		
	ChinMinor (1)	JapnMinor (2)	SpanMinor (3)
ChinYN	0.212		
	(0.196)		
JapnYN		0.110	
		(0.087)	
SpanYN			0.238**
			(0.093)
EthNatPeerRatio	0.317	0.234	0.591*
	(0.342)	(0.219)	(0.324)
Fem	0.153	−0.141	0.043
	(0.273)	(0.132)	(0.192)
PeerFem	0.156	−0.447**	−0.090
	(0.381)	(0.222)	(0.234)
ChinYN*EthNatPeerRatio	−0.376		
	(0.308)		
JapnYN*EthNatPeerRatio		0.273	
		(0.790)	
SpanYN*EthNatPeerRatio			−1.933***
			(0.633)
Fem*PeerFem	−0.064	0.362	−0.094
	(0.515)	(0.246)	(0.312)
FroshCount	−0.001	0.004	0.001
	(0.008)	(0.003)	(0.003)
ChinesePeerRatio		0.088	0.263
		(0.142)	(0.330)
JapanesePeerRatio	0.372		−0.813
	(0.947)		(0.825)
SpanishPeerRatio	0.289	−0.232	
	(0.874)	(0.297)	
KoreanPeerRatio	1.461	0.504**	−0.110
	(0.752)	(0.235)	(0.418)
SAsianPeerRatio	−2.314	0.023	0.223
	(1.479)	(0.659)	(0.420)
WhitePeerRatio	−0.477	0.079	0.105
	(0.497)	(0.246)	(0.190)
Year Fixed Effects	Yes	Yes	Yes
Section Fixed Effects	Yes	Yes	Yes
Observations	458	1,244	835
R^2	0.126	0.062	0.064
Adjusted R^2	0.054	0.035	0.023
Residual Std. Error	0.477 (df = 422)	0.489 (df = 1208)	0.403 (df = 799)
Note:			*p<0.1; **p<0.05; ***p<0.01