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Eric S. Lin
Yu-Lung Lu

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Eric S. Lin
National Tsing Hua University
and IZA

Yu-Lung Lu
National Tsing Hua University

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

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ABSTRACT

The Educational Achievement of Pupils with Immigrant and Native Mothers: Evidence from Taiwan*

This paper takes advantage of the Taiwan Assessment of Student Achievement data set to empirically evaluate whether the test score differentials between pupils with immigrant and native mothers are substantial across subjects, grades and years. Our results show that there exist test score differentials between the two groups after controlling for the students' individual characteristics and family background. The Chinese, Math and English subjects exhibit larger test score gaps relative to Science and Society. We also find that the academic gaps between native students and pupils with mothers from Southeast Asian countries tend to widen, while the students' performance is about the same as that for native students if their mothers are from mainland China, confirming that the language proficiency of immigrant mothers significantly affects pupils' learning. Our empirical results may suggest that remedial teaching (or an equivalent preferential policy) for the lower-grade pupils with immigrant mothers might be required to create a fair environment for learning, and such a policy should take the nationality of those foreign mothers into account.

JEL Classification: A2, I2

Keywords: academic performance, immigrants, foreign spouse

Corresponding author:

Eric S. Lin
Department of Economics
National Tsing Hua University
Hsin-Chu 30013
Taiwan
E-mail: slin@mx.nthu.edu.tw

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1 Introduction

Since the late 1990s, the number of immigrant brides has been increasing rapidly in Taiwan. The prevalence of an increasing trend in international marriages has led to a growing number of children with immigrant mothers (the so-called "New-Taiwanese Offspring").[1] This phenomenon brings with it a new impact on education, culture, and lifestyle in Taiwanese society. According to "The Study on the Learning Performance of Immigrant Children in Taiwan",[2] it is reported that the academic performance of native and immigrant pupils over the various school subjects (e.g., mathematics, Chinese literature, science, society, etc.) does not clearly differ based on the subjective judgements of homeroom teachers.[3] Several news media, however, report that the pupils with immigrant mothers tend to be inferior to natives in terms of learning performance.[4] They argue that it is because the immigrant mothers may have difficulty following the curriculum, supervising the homework assignment, and communicating with school teachers. In sum, with an increasing number of immigrant spouses and their children, whether or not there exists a significant gap in terms of academic achievement between native and immigrant children has not been extensively explored. A systematic study which directly quantifies the test score differentials between the two groups of students is clearly needed.

There are three reasons to be concerned about the academic performance of immigrant children relative to the native ones. First of all, what role does the mother's nationality play in terms of the academic performance of pupils? This concerns the equity issue. If significant test score differentials exist – the only difference between the two groups of students is the country origin of their mothers (holding other factors constant), it is justifiable for school authorities to allocate more resources to improve the disadvantaged minority. Secondly, the students with immigrant mothers have not yet received much attention from the Taiwanese government even though the aboriginal students are recognized as being relatively vulnerable in regard to school learning (Tsai and Chiu, 1993). Hence, the existing preferential policy aims to help the aboriginal students such as by offering different types of scholarships, financial aid, free meals and tutoring services.[5] However, there is only a very limited number of preferential

[1] Due to the trend towards globalization, Taiwanese women marry men from other countries, and Taiwanese men marry women from other countries. However, this article focuses on the latter case, where foreign wives account for the majority of transnational marriages.

[2] This study conducted by the Ministry of Education of Taiwan aims to investigate the learning performance of elementary school and high school students with immigrant mothers. For more details, please refer to the following link: http://open.nat.gov.tw/OpenFront/index.jspx.

[3] It is worth noting that this study did not directly collect students' test scores (over various subjects). Instead, the learning performance of the children is examined by means of sending out questionnaires to homeroom teachers and asking them their opinions on the academic performance of students, e.g., do you think the two groups of students perform differently?

[4] The materials can be found through a subscribed search at the following websites: http://udn.com/NEWS/main.html, http://news.chinatimes.com/ and http://www.cna.com.tw/. They are available upon request from the authors.

[5] The Taiwanese government even provides the aboriginal students (aboriginal people accounted for about 2.1% of the total population in 2009) with extra points in the school entrance examinations. For instance,

policies that focus on the group of "New-Taiwanese Offspring" except for one just recently issued.[6] If the "New-Taiwanese Offspring" were found to be less advantaged compared to the local students in terms of learning performance, this study may provide a sound basis for future policy design in regard to re-allocating resources to pupils with immigrant mothers. Finally, previous studies have shown that students who do not succeed in learning may have a tendency to cause social problems such as fighting or taking drugs (Jensen, 1997; Sutherland and Shepherd, 2001; Diego et al., 2003). If we can identify a group of students who do not perform as well as others systematically, some adequate remedies or aid will be required to put a stop to the students' negative behavior. All in all, a good understanding of the academic achievement of the children with immigrant mothers is both important and urgent.

To the best of our knowledge, there are very few studies that quantitatively examine the academic achievements of "New-Taiwanese Offspring" and compare them to the native students directly through test scores. This paper contributes to the literature by comparing the academic achievements of pupils with immigrant mothers with those of native mothers in Taiwan, after considering different subjects, grades and time trends. The Taiwan Assessment of Student Achievement database provides an excellent opportunity to study the performance of these two groups. This data set consists of a rich variety of variables on student characteristics, their family background, and test scores for various subjects in their different grades over the period from 2005 to 2007. It allows us to analyze the test score gaps across different subjects and grades as well as the time trend. Specifically, we investigate the following questions in this article: Is there a gap in terms of academic performance between these two groups of children? Does the gap in academic performance between these two groups of children matter across various subjects (e.g., Mathematics, English, Chinese Literature, Science and Society) if at all? How would the gap change as the children grow up? Will the two broad classes of foreign spouses (i.e., Southeast Asian and those from mainland China) have similar or different impacts on children's academic performance since the nationality of immigrant mothers may matter? That is, we extensively evaluate the learning gaps between pupils with immigrant and native mothers, including the gaps across different grades, subjects and time spans.

It is worth noting that our work differs from previous studies which concentrate on comparing the learning of immigrant (either first or second generation) and native children in several respects. First, unlike the literature on the first-generation children vs. their native counterparts (e.g., Kao and Tienda, 1995; Schenpf, 2004; Schwartz and Stiefel, 2006), the "New-Taiwanese Offspring" did not move to Taiwan from foreign countries. Instead, the pupils in our analysis were all born in the same country (i.e., in Taiwan). The key feature is that the mothers of the "New-Taiwanese Offspring" are immigrants from overseas countries (mainly Southeast Asian countries and mainland China) other than Taiwan. Second, the

if the aboriginal students pass the Aboriginal Language Ability Certification (ALAC), they will enjoy more preferential policy advantages in schooling. The extra points earned could be up to 35%.

[6]The Taipei City Government has launched a policy whereby a child whose father or mother is a foreign national has the priority to enter a public kindergarten. For more details, please refer to the following websites: http://english.doe.taipei.gov.tw/ct.asp?xitem=144897&CtNode=15791&mp=104002.

"New-Taiwanese Offspring" can be regarded as second-generation children since their mothers moved to Taiwan from other countries (e.g., Portes and Rumbaut, 2001; Cohen and Haberfeld, 2003). However, they are distinct from typical second-generation kids in that their fathers are native Taiwanese. In fact, it is usually the case that only the mothers of the "New-Taiwanese Offspring" are immigrants in their family.[7] In sum, the particular feature of our study stems from marriage-based immigration rather than other types of immigration such as that of an economic (e.g., investment) or political nature.[8]

The remainder of this paper is organized as follows. The next section provides a background introduction to the foreign spouses in Taiwan. Section 3 outlines the theoretical justification of the academic performance differentials between immigrant and native-born students. Section 4 describes the data and econometric methodology utilized in the empirical evaluation. Section 5 presents and discusses our empirical results. The final section concludes.

2 Background Information on the Foreign Spouses in Taiwan

Taiwan, also known as Formosa (meaning "Beautiful" in Portuguese), is an island situated in East Asia in the Western Pacific Ocean and located off the south-eastern coast of mainland China. The population in Taiwan was estimated in 2010 to be 23 million, where 86% are descendants of early Han Chinese immigrants known as "benshengren" in Chinese or "native Taiwanese" in English, 12% of the population are known as "waishengren" in Chinese who (or whose ancestors) immigrated from mainland China after the Chinese Civil War with the Kuomintang (KMT) government, and the other 2% of Taiwan's population, numbering about 458,000, are listed as Taiwanese aborigines. Standard Mandarin is officially recognized by the government of the Republic of China (ROC) as the national language and is spoken by the vast majority of residents.[9] According to the statistical information provided by the Department of Statistics, Ministry of Interior in Taiwan, immigrant brides accounted for about 1.30% of Taiwan's population in 2009, which was slightly less than the proportion of Taiwanese aborigines.

In 1949, the ROC government lost mainland China in the Chinese Civil War to the Communist Party of China and resettled its government on Taiwan. During 1949 to 1987, contacts between mainland China and Taiwan were very restricted and thus limited due to there being no official channel for the two sides to gain access to each other. In 1987, the Taiwanese government allowed trips to the mainland for visiting relatives, but social problems arose such as

[7] In the literature, the related concept is referred to as the "1.5 generation", which usually define the family members of the "1.5 generation" as children with at least one immigrant parent who were born in their home countries and immigrated to the U.S. at age 12 or earlier. Please refer to Oh and Min (2011) for more details.

[8] For example, Tsay (2006) investigates the educational attainment of second-generation Mainland Chinese *political* immigrants, where their parents (known as the first-generation political immigrants) moved to Taiwan when Chiang Kai-Shek's forces were defeated by the People's Liberation Army on mainland China. Tsay finds that the father's immigration status helps his children achieve a higher educational qualification than native counterparts after controlling other factors of educational attainment.

[9] Standard Mandarin is also the national language in mainland China.

those related to bigamy and inheritance issues. Therefore, in 1992, the Taiwanese government enacted a law referred to as the "Act Governing Relations between the People of the Taiwan Area and the Mainland Area" so that a spouse of mainland Chinese nationality could have the right to reside or settle in Taiwan. Hence, since the late 1990s, the number of immigrant brides has been increasing rapidly in Taiwan. The proportion of immigrant brides accounted for 14.1% of married couples overall in 1998 and this ratio rose even higher to 28.4% in 2003.[10] When we examine this phenomenon of immigrant brides by looking at those coming from mainland China alone, we observe a similar trend to that for the foreign brides as a whole. The ratio of "China brides" to total brides peaked at 18.5% in 2003 (see Figure 1). Since the increasing numbers of foreign spouses (mostly foreign wives) gave rise to social problems such as fake marriages, in 2004 the Taiwanese government enacted a law to interview the future brides before granting them approval to get married. It is apparent that there has since been a sharp decline in China brides, with the ratio having fallen to 8% in 2004. However, in 2004 the number of foreign female spouses from other countries (mainly countries in Southeast Asia) did not decrease significantly. After 2003, the ratio of immigrant brides was slightly above 12% although it did fluctuate slightly. In 2009, it can be observed that the foreign brides accounted for 16% of all brides, which was nevertheless a sizable proportion among the newly-married couples. One of the reasons for the prevalence of marrying foreign brides may be due to the traditional concept of passing on family names. Since some Taiwanese males have not been able to find appropriate females to continue the next generation, they have turned to marrying females from foreign countries, especially from Southeast Asia or mainland China (Su, 2006). In addition, the transnational marriages happen frequently when some Taiwanese men consider themselves to be at a disadvantage in finding Taiwanese wives.

The prevalence of an increasing trend in international marriages has led to a growing number of children with immigrant mothers. A report compiled by the Department of Household Registration, Ministry of Interior in Taiwan reveals that "New-Taiwanese Offspring" accounted for around 5.12% of total newborns in 1998, and the ratio increased to 13.37% in 2003, while the ratio declined to 8.86% in 2009 (see Figure 2). We note that the trend is consistent with the rising ratio of immigrant brides as shown in Figure 1. It is also interesting to observe that the ratio of immigrant brides coming from mainland China is higher than that for other countries, but the children with mothers from mainland China are fewer than those with mothers from other countries (Chuang et al., 2010).

Based on the Compulsory School Attendance Regulation in Taiwan, it is mandatory for children to receive primary education at the age of 6 or 7. Only 1.39% of the children in elementary schools during the school year in 2003 had immigrant mothers, but the proportion increased dramatically to 5.19% during the 2007 academic year (see Figure 3).[11] Figure 3 also exhibits the trend for pupils in junior high schools, indicating that the ratio was 0.36% during

[10] Data source: Department of Household Registration, Ministry of Interior. http://www.ris.gov.tw/web_eng/eng_sta.html.

[11] Data source: Department of Statistics, Ministry of Education.

the 2003 school year, and increased to 1.33% during the 2007 school year. With increases in both foreign spouses and their children, there will definitely be an impact on many dimensions in Taiwanese society and the government is facing a critical challenge to set up related policies in regard to education, fertility, insurance, the labor force, and so on.

3 Theoretical Arguments

Prior studies on immigrant education have offered a variety of explanations for differences in performance between immigrant and native-born students. The classic view argues that there should not be any differences in academic performance between the two groups. It is likely that there exists an academic gap between the children from immigrant and native-born families, and the children from immigrant families may start out behind their peers with native-born parents. However, these children of immigrants catch up through the process of socialization and adaptation. The academic performance of immigrant students may be even better than that of native-born students (Schwartz and Stiefel, 2006; Glick, 2010).[12] By contrast, an alternative view indicates that the progress through formal institutions may be hindered by existing disadvantages associated with positions, such as racial/ethnic hierarchy. According to this view, the children from immigrant families with historically disadvantaged positions may hardly catch up with their native-born peers. This is known as the "segmented" or "divergent" assimilation perspective, suggesting that children of immigrants are deeply affected by their immigrant parents' socio-backgrounds (Fernandez-Kelly and Schauffler, 1994; Jain and Belsky, 1997; Leidy et al., 2009; Portes and Zhou, 1993; Rumbaut, 1997).

Regarding the first point of view, there are some reasons that explain why these children of immigrants could catch up with the native ones. The first reason is in regard to the parents' attitude. Some researchers have found that immigrant parents' positive attitudes toward education as well as the support and encouragement provided for their children can explain the immigrant children's success in academic performance, particularly in the United States (Waters, 1999). The second reason is that the immigrant parents often possess a strong work ethic and value system, which can translate into academic successes among their children despite their, on average, relatively disadvantaged socio-economic backgrounds (e.g., Gibson, 1988; Caplan et al., 1989; Kao and Tienda, 1995; Portes and Rumbaut, 2001). For example, immigrant children's relative successes may be even greater in schools with largely poor and nonwhite native-born students, such as those in New York City (Conger et al., 2007).

As for the argument that the children from immigrant families may perform worse than the native-born ones, the limited language proficiency may be the primary reason why the children from immigrant families, including first and second generation children, perform worse than native-born students (Rosenthal et al., 1983; Cosden et al., 1995). The differentials in academic performance will arise not only in literacy and language arts, but also in other school

[12] Schwartz and Stiefel (2006) show that immigrant students largely perform better than native-born students in reading and math, while the nativity gap is reduced if the family and school factors are controlled.

subjects such as math (Bleakley and Chin, 2004). Meanwhile, the lack of language proficiency in immigrant parents may also cause them to be less involved in their children's schooling (Kao and Tienda, 1995). The support of family resources is also a crucial factor that influences academic performance between immigrant families and native-born ones. Most immigrants have disadvantaged socio-economic positions, and even worse, this position will generally hold for at least two generations (Van Amersfoort, 1974). Furthermore, in comparison with parents whose backgrounds more closely resemble the teachers', parents with less-advantaged backgrounds are not perceived as having the common interest or mutual understanding by the teachers (Lareau, 1989), which may hamper the communication and interaction between immigrant parents and teachers of their children. Lastly, the legal status of immigrants and their parents serves as an alternative explanation in the literature. For instance, the foreign-born students may stay in the U.S. as green card holders, temporary residents, or they may maintain an uncertain legal status. Therefore, different types of legal status may induce different direct as well as indirect impacts on performance through mobility, earnings, accessibility to complementary services, or other channels (Schwartz and Stiefel, 2006).

Some factors contribute to the academic performance of immigrant children compared to that of their native-born counterparts while the effect may be indeterminate. In particular, the native-born may differ from the foreign-born in terms of the health or disability characteristics that affect the pupils' academic performance. Several studies show that the immigrants are healthier than the native-born, while others suggest the opposite (Hernandez and Charney, 1998; Kao, 1999; Harker, 2001; Capps et al., 2004). The prior academic experiences of immigrant children in their home country may also affect their academic performance. Taking the U.S. immigrants as an example, those from countries with highly developed comprehensive educational systems such as Russia and other Eastern European countries may perform better than the native-born pupils. By contrary, immigrants from countries with less rigorous and comprehensive educational systems such as Mexico or the Dominican Republic may perform worse than the U.S. native-born pupils.

In this study, we concentrate on a comparison between second-generation and native pupils in Taiwan, where all pupils are born in Taiwan but the mothers of second-generation children move to Taiwan on a basis of intermarriage. As pointed out in Section 1, the so-called "New-Taiwanese Offspring" can be dubbed second-generation students, for their mothers are immigrants. Given the fact that the children from immigrant families in Taiwan are generally less advantaged in terms of family background and social status (which will be shown in Section 4), we expect that the native-born students will tend to perform better than second-generation students in terms of academic achievement. This can be justified by previous studies that found that the disadvantageous language proficiency of the foreign spouses (mainly the pupils' mothers) contributes to the inferior performance of the second-generation students (Rosenthal et al., 1983; Rong and Grant, 1992; Cosden et al., 1995; Kao and Tienda, 1995), that the parents' disadvantaged socio-economic positions may carry over to the next generations (Van Amersfoort, 1974), and that the lack of common interest or mutual understanding between school

teachers and parents may hamper the learning of the "New-Taiwanese Offspring" (Lareau, 1989). In addition, the foreign brides in Taiwan can be roughly grouped into mainland China and Southeast Asian brides based on their country of origin, where Mandarin is the common language shared by both sides of the Taiwan Strait. Therefore, the pupils with mothers from mainland China may be at an advantage in terms of academic achievement compared with those with mothers from Southeast Asian countries. In what follows, we perform an empirical analysis to assess and verify the validity of these arguments in several respects (i.e., by subjects, grades and time trends) using a large systematic data set rather than conducting a small-scale qualitative study.

4 Data and Estimation Strategy

4.1 Data description

The data utilized in this paper are taken from the Taiwan Assessment of Student Achievement (TASA) – compiled by the National Academy for Educational Research Preparatory Office which was commissioned to investigate the elementary school and high school students' achievement by the Ministry of Education in Taiwan.[13] The TASA data set is designed to provide a qualifications assessment service by collecting the source data in each county in Taiwan (i.e., there are 23 counties in total). The information that evaluates the learning situation of students can be used by the county municipal government to formulate a remedial teaching policy. In addition, there are several existing international data sets on students' achievement,[14] while such types of data focusing on elementary and high school students in Taiwan are relatively scarce. Therefore, TASA is devoted to building upon an internationally comparable data base to make it easy to compare the students' academic achievements in other countries, and to understand the special features of the Taiwanese education system. In particular, TASA includes three waves (i.e., 2005, 2006 and 2007 survey years) and students' test scores for five school subjects (Chinese Literature, Mathematics, English, Science and Society). Furthermore, there are five grades in our data set, including the 4th, 6th, 8th and 11th grades.[15] A multistage stratified sampling method is adopted for TASA to survey implementation. The first stage is to determine the schools by a proportionate stratification on the basis of the country and city level, villages and towns population density, and the school scales (i.e., three strata). In the second stage, a simple random sampling is then adopted to choose students among the schools determined in the first stage. The students are asked to take the exam on *only* two school subjects (e.g., Math and Society or Math and Chinese, and so on), so the sample size is different for each subject. TASA interviewers not only test the academic performance in the classroom under a standardized condition, but also collect students' background information

[13] Please refer to http://tasa.naer.edu.tw/.

[14] For example, The Trends in International Mathematics and Science Study (TIMSS), Program for International Student Assessment (PISA) and Progress of International Reading Literacy Study (PIRLS).

[15] In addition to those grades, our data also cover the 2nd grade (equivalent to the 11th grade of "regular" high schools) of vocational high schools.

(including personal and family background). Because the share of the children with immigrant mothers is very limited in high school, we therefore use the data from the two grades (4th and 6th) in elementary school for our study purposes.[16] The data, unfortunately, do not allow us to use the panel data structure to control for individual heterogeneity by following the same children from the 4th to the 6th grade. Thereby, we shall observe that the sample sizes are different across year, grade and subject.

The descriptions of the variables are listed in Table 1. The test score (dependent variable) is constructed by computing the number of questions answered correctly in each exam and transforming it into a 1–100 scale for interpretation purposes, e.g., a score of 80 corresponds to answering 40 questions correctly out of a total of 50 questions. The mother's nationality is a dummy variable, where 0 is coded to indicate a student's mother being Taiwanese and 1 represents an immigrant mother. For marital status, 1 indicates the parents are married and living together while for others the variable is 0. The sibling variable refers to the number of a pupil's brothers and sisters. Gender is controlled as well since males and females inherit different personality traits and may act very differently under social norms. The gender differential in terms of academic achievement has been found in previous studies, e.g., Stumpf and Stanley (1996), Nowell and Hedges (1998) and Penner and Paret (2008). We also classify the parents' education level into eight categories (e.g., high school, college, masters, and so on) and the parents' occupation into nine types (e.g., technical staff, office worker, agroforestry, and so on).[17]

4.2 Data summary

Table 2 lists the proportion of pupils with immigrant and native mothers as well as the corresponding test scores across grade, subject and year. The ratios for the students with immigrant mothers ranges from 2.45% (6th grade Science in 2007) to 10.52% (4th grade English in 2006) in our sample. As expected, we find that the ratio of immigrant mothers tends to decrease with the grade when fixing the year, say 2006 or 2007, indicating that the number of new Taiwanese offspring keeps increasing as shown in Figure 2.[18] In regard to the test scores, Table 2 shows that the mother's nationality does matter. Pupils with native mothers seem to outperform those with immigrant mothers in all cases, while the difference may be mild in Science and Society.

The parents' educational level and the marital status between the two groups of pupils are shown in Table 3. We observe that parents' (both mothers' and fathers') years of schooling for native students are apparently higher than those of the new Taiwanese offspring. Fathers'

[16] We note that the number of migrant brides has been increasing in the 1990s, so their children are still very young – the majority of their children are at the stage of being in elementary schools instead of studying in high schools.

[17] For more detailed information, please refer to Table 1.

[18] Note that when we observe students in the 4th grade in 2006, their mothers are likely to have given birth as early as in 1996. Similarly, an immigrant mother may have given birth up to 1994 for a 6th grade student in 2006.

years of schooling exceeds the mothers' counterpart, there being no exception for native pupils. However, immigrant mothers have more years of schooling than their spouses in several cases. The ratio of parents that are married and living together is also reported in Table 3, showing that the parents of native students exhibit a tendency to live together. The phenomenon that immigrant mothers reveal a higher divorce rate than native mothers is in accordance with a report by the Ministry of Interior in 2007.[19]

Due to the fact that we have three years, two grades and five school subjects, it is hard to show the details of the summary statistics one by one. We take the data from the 4th grade Chinese in 2007 as an example, where the ratio of immigrant mothers is about 5%. Table 4 indicates that the proportions of fathers with an education level including a college and master's degree (22.87% and 9.79%) for native pupils are clearly higher than those for the new Taiwanese offspring (16.56% and 6.62%). In addition, the data exhibit the fathers' occupational differences between the two groups of pupils. The ratios for being "team leader or government officer" or "professionals or CEOs" among the native students' fathers (18.45% and 20.13%) is higher than that for the new Taiwanese offspring (13.25% and 15.23%). As for the education level, the ratio of having either a college or master's degree among native mothers (24.51% and 5.33%) is higher than that among the immigrant ones (18.54% and 3.31%). In sum, the students with immigrant mothers generally have a relatively disadvantaged socioeconomic background in terms of the parents' occupation and education level. We further classify the immigrant mothers' nationality into either mainland China or Southeast Asian countries in the last four columns. It is observed that, compared to native parents, the parents of new Taiwanese offspring tend to have a lower proportion of higher education and to hold a position that is non-technical or in agroforestry, which is particularly remarkable for families with Southeast Asian mothers. It is also noted that the couples with wives from Southeast Asia are more likely to work in agroforestry compared to other families.

4.3 Model specification

We estimate two sets of regression models. The first set of regression models evaluates the academic performance between the students with immigrant and native mothers. We distinguish the native mothers from the foreign brides (including immigrants from Southeast Asia and mainland China) by including a dummy variable in the following linear regression:

$$\text{Testscore}_i = \gamma_o + I_i\gamma_1 + D_i'\gamma_2 + S_i'\gamma_3 + \varepsilon_i, \tag{1}$$

where the dependent variable Testscore_i denotes the test score in each subject. Recall that the test score has been transformed to a 1–100 scale for interpretation purposes. I_i is the dummy

[19] According to the Department of Statistics, Ministry of Interior in Taiwan, the divorce rate of married population for people who married foreign brides was 27.19% in 2007. Meanwhile, the divorce rate of married population for people who married local women was 10.02%. The statistics show that native people who married native brides have a lower divorce rate, and the result is consistent with our data. Please refer to http://www.moi.gov.tw/stat/index.aspx/.

variable for the mothers' nationality with Taiwanese mothers being the reference group. D_i is a vector of variables capturing the student's individual characteristics and family status such as gender, number of siblings, the parents' status (married and living together or not). S_i is a vector of variables capturing the student's socioeconomic background such as the parents' education level and occupation. The γ's are parameters to be estimated, where γ_1 captures the test score gap between the native pupils and new Taiwanese offspring. ε_i is the random error term.

Due to the fact that the culture of mainland China and Taiwan is closely related and people use almost the same language in these two places, Chuang et al. (2010) study the employment status and choice of employment sector of female foreign spouses from Southeast Asia and mainland China in Taiwan. They find that the two groups of foreign spouses behave differently in terms of their labor market activity. This motivates us to further separate the foreign dummy variables I_i into mainland China (I_{1i}) and Southeast Asian countries (I_{2i}) with Taiwanese mothers being the reference group.

$$\text{Testscore}_i = \alpha_o + I_{1i}\alpha_1 + I_{2i}\alpha_2 + D_i'\alpha_3 + S_i'\alpha_4 + \nu_i, \tag{2}$$

where the α's are parameters and ν_i denotes the error term.

5 Empirical Results

Since many regressions are performed across different grades, subjects and years, once again we take the estimation results based on the 4th grade Chinese in 2007 as an example to illustrate the preliminary findings.[20] Table 5 indicates that, relative to native mothers, the pupils with immigrant mothers receive significantly lower 4th grade Chinese test scores in 2007 under different model specifications (Models 1–6). In addition, parents that live together, female pupils and fewer siblings are positively associated with students' Chinese test scores. Parents with higher education levels tend to result in higher test scores of pupils. Parents' jobs including being a manager, the leader of a government office and an office worker are also highly correlated with the children's test performance.

When more control variables are included in the regressions (Models 1–3 and Models 4–6 in Table 5), it can clearly be seen that the test score differentials due to the mothers' nationality start to shrink, e.g., they fall from -6.6340 to -4.0549 in the columns of native vs. immigrant mothers and from -2.3096 to -1.2096 for mainland China mothers, and from -11.2547 to -7.2670 for Southeast Asian mothers. This finding is consistent with previous studies (Hedges and Nowell, 1998, 1999; Cook and Evans, 2000; Fryer and Levitt, 2004, 2006), which claim that the gaps between the two groups are reduced when we take the family socioeconomic status into consideration.

[20] We have implemented 21 sets of regressions in this study and have made the entire estimation results available upon request from the authors.

Table 6 reports the marginal effect of the mothers' nationality (i.e., the coefficient of the mother nationality dummies) on the pupils' test scores based on Equations (1) and (2).[21] It is observed that there do exist score differentials between pupils with immigrant (in terms of mainland China and Southeast Asia origins as a whole) and native mothers after controlling students' individual characteristics and family background (see Model A in Table 6). The negative and significant coefficients suggest that the native students perform better than the new Taiwanese offspring in terms of test scores. We further split the immigrant mothers' nationality into mainland China and Southeast Asian countries. Model C in Table 6 reveals that academic gaps between native students and pupils with mothers moving from Southeast Asian countries tend to become larger. However, with mothers coming from mainland China, the students' performance is at about the same level as that of the native students (see Model B). This finding shows that for new Taiwanese offspring whose mothers immigrated from China, the potential disadvantage in terms of learning can be drastically alleviated because mothers from mainland China speak a similar language to native Taiwanese mothers and take advantage of interacting with teachers to help the children to study in school.[22]

The main finding in this paper is thus along the lines of previous studies in that pupils of immigrants are influenced deeply by their disadvantaged parents (e.g., Fernandez-Kelly and Schauffler, 1994; Jain and Belsky, 1997; Leidy et al., 2009). When classifying immigrant mothers into mainland China and Southeast Asian countries based on their mother tongue, children with Southeast Asian mothers reveal a significant learning gap, while this is not the case for foreign spouses from mainland China. This emphasizes how important a role the language factor plays in the academic performance of the "New-Taiwanese Offspring". Our results are associated with the arguments in the literature that the disadvantageous language proficiency of the foreign spouses is likely to affect the performance of the second-generation students (Van Amersfoort, 1974; Rosenthal et al., 1983; Lareau, 1989; Rong and Grant, 1992; Cosden et al., 1995; Kao and Tienda, 1995).

As mentioned in the Introduction section, the launching of a recent policy by the Taiwanese government entitles the new Taiwanese offspring to enjoy the privilege of entering a public kindergarten, which is financed by the government and is considered to be better quality. However, this policy does not distinguish the mother's nationality in the case of the new Taiwanese offspring. Our empirical findings may suggest that the decision maker should focus on pupils with mothers from Southeast Asia in a future preferential policy rather than on students with mothers from mainland China.

When we consider the performance of students in different grades (i.e., by comparing the

[21] Since our main interest in this article is to explore whether immigrant mothers matter in regard to pupils' academic achievement, Table 6 displays only the coefficients on the nationalities of the mothers dummies. For example, the coefficient -4.0549 (Model 3 in Table 5) also appears at the 4th grade Chinese in 2007 (Model A in Table 6). The full set of estimation results is available from the authors upon request.

[22] We note that this main finding is quite stable in the sense that the pooled model across years gives rise to very similar results.

4th grade with the 6th grade in 2006 or 2007),[23] we find that the gaps in the test scores between the two groups do not get worse as the children grow. For example, the score differential for 4th grade English in 2006 is -3.6246, which is significant at the 1% level, while the gap (with an insignificant value of -1.3310) in the test scores between the two groups disappears for the 6th grade in the same year. We also observe a similar trend for Chinese, English, Math, and Science, but not for Society. This is the case if we look at the results which distinguish the mothers' nationality in Models 2 and 3 in Table 6. The gaps tend to be alleviated compared to the 4th grade and the 6th grade in the same year. In particular, pupils with mothers from mainland China perform slightly better than native students in several cases, e.g., English in 2006 and Math in 2007. Regarding the Southeast Asian mothers, we consistently find no better performance by their children than in the case of the native ones.

It is worth noting that Coleman (1966) and Fryer and Levitt (2004, 2006) find that the academic gap between black and white students widens as the pupils grow up, while we obtain a narrowing academic gap between the native students and pupils with immigrant mothers. Krueger and Whitmore (2001) and Phillips et al. (1998) attribute the widening discrepancy to the poor school quality of black pupils. However, according to our data set, the two groups of pupils account for about the same proportion in each elementary school in Taiwan. Therefore, there is no evidence of native students entering exclusive schools – suggesting that there might be an assimilation effect between the two groups of pupils. Several studies (e.g., Baron et al., 1985; Dusek, 1975; Ferguson, 2003; Lightfoot, 1978) also argue that the black pupils may suffer from discrimination in schools or may receive a lower expectation from their school teachers, which might lead to an increasing performance differential. In Taiwan, racial discrimination is not a prevailing issue. School teachers in Taiwan generally treat all students in the same way – especially when native students and new Taiwanese offspring can not be clearly distinguished from their appearance (Chen et al., 2007). Even though in this study we find a declining trend of test score gaps in elementary schools, more data covering a longer period of time may be needed to examine whether the trend still holds in middle and high schools.

In regard to different school subjects, significant test score differentials can be found between the children of immigrant and native mothers in most courses (see Model A in Table 6). This finding is along the lines of that found in the previous studies (e.g., Campbell et al., 2000; Neal, 2005), which show that there exist substantial differences between black and white pupils by school subjects such as math and reading. More specifically, Model A in Table 6 indicates that the gaps in the pupils' 4th grade are all consistently significant across subjects. It also reveals that the gaps for Chinese, English and Math are larger than those for Science and Society in most situations. The gaps in Science disappear in the 6th grade while this is not the case in Society. In Models B and C, the pupils with Southeast Asian mothers tend to perform badly in Chinese, English and Math relative to native students, while this is not

[23] There is no way of making a comparison in 2005 due to the fact that our data are available only for the 6th grade in 2005. We face the same data limitation in the case of Society, where only 6th grade data in both 2006 and 2007 are obtained.

the case for children with mothers coming from mainland China. One of the possible causes is that the Southeast Asian mothers find it hard to preview/review the class materials due to the language deficiency and/or to communicate with school teachers to improve the learning of their children (Lareau, 1989). As for the mothers from Mainland China, it is much easier for them to communicate with school teachers and thus their children can benefit from the learning process. The lessons based on our finding suggest that 1) the pupils with mothers from China perform as well as the native ones, and 2) the school or government authorities may provide remedial education to pupils with mothers from Southeast Asia – by especially focusing on the Chinese, English and Math subjects.

When inspecting the trend in the gaps over time, it is observed that the gaps for two groups do not change drastically in our sample period. Some exceptions include the 6th grade Math in 2006 (-2.7776 at the 5% level) becoming insignificant in 2007 (-2.5076) and the 6th grade English in 2006 (-1.3310) turning to be significant in the 2007 (-2.9903 at the 5% level) counterpart. We note that previous studies conclude that the gaps may decline over time (e.g., Grissmer et al., 1998; Hedges and Nowell, 1998; Humphreys, 1988). Nevertheless, a further study that extends the period of time under study is needed to explore the trend.

In addition to the regression analysis, we also perform the analysis of variance (ANOVA), which is a widely-applied statistical test of whether or not the means (test scores in our context) of several groups are equal.[24] Table 7 shows the separate ANOVA result based on five subjects, two grades and three years. We are not able to compare multivariate (population) means of several groups by implementing multivariate analysis of variance (MANOVA) since our data set does not provide the required information, e.g., Chinese, English and Math test scores for a 6th grade student in 2007 (see also the Data description subsection). Table 7 reveals that the pupils with native mothers outperform those with immigrant mothers in most cases. Furthermore, we separate the immigrant mothers' nationalities into mainland China and Southeast Asian countries. It is clear to see that the pupils with Southeast Asian mothers perform significantly worse than the native-born kids. Nevertheless, the test scores of pupils with Mainland China mothers do not make a significant difference compared to native counterparts in most occasions. All in all, these findings based on ANOVA confirm our empirical results in terms of multiple regression models.

6 Conclusion

International marriages have increased rapidly in Taiwan in the past decade, and have been accompanied by the increasing number of births of so-called "New Taiwanese Offspring". However, there is a lack of systematic/quantitative research in terms of comparing the academic performance of these new Taiwanese offspring with that of native students even though some news reports or small-scale studies point out the disadvantages that pupils with immigrant mothers face when learning. It could be the ignorance regarding this issue that has resulted

[24] We are grateful to an anonymous referee for directing us to implement the ANOVA analysis.

in the Taiwanese government proposing very limited preferential policies that target these pupils. This study takes advantage of the Taiwan Assessment of Student Achievement data established by the National Academy for Educational Research Preparatory Office in Taiwan to empirically assess whether or not there is a (standardized) test score differential between the two groups of students in elementary schools. In particular, we are also able to examine whether the gaps prevail by subject, grade and year. We further separate the nationalities of foreign spouses into mainland China and Southeast Asia since mothers from mainland China literally use the same language as native mothers in Taiwan.

Our empirical results first show that the test score gaps tend to shrink as more soci-economic background variables are controlled in the regression models. We also show that there do exist score differentials between pupils with immigrant and native mothers after controlling for the students' individual characteristics and family background. This finding necessitates an adequate policy to help out the disadvantaged students with mothers from overseas. When considering the language similarity between native mothers and those from mainland China, the potential disadvantage in learning has been drastically alleviated, while the academic gaps between native students and pupils with mothers moving from Southeast Asia countries tend to widen. We emphasize that the language disadvantage of mothers (especially for those from Southeast Asia) may weaken the effective communication with school teachers and in turn hamper the learning of their children. The language or communication problems can be improved by providing suitable Chinese language training programs for mothers from Southeast Asia.

The difficulties that the pupils and their foreign mothers may also face include the following: the families with foreign mothers tend to receive less (domestically) external cultural stimulation, and the lack of social capital of immigrant mothers hampers the interpersonal relationships of their children in school. These factors are along the lines of previous studies in that pupils of immigrant mothers may perform worse than those of native mothers (e.g., Fernandez-Kelly and Schauffler, 1994; Jain and Belsky, 1997; Leidy et al., 2009; Van Amersfoort, 1974; Rosenthal et al., 1983; Lareau, 1989; Rong and Grant, 1992; Cosden et al., 1995; Kao and Tienda, 1995). The point is that the ineffective learning of pupils with immigrant mothers does not pertain to the pupils themselves, but can be attributed to their feeling that they are not treated in a "seems fair" environment. Therefore, some policies should be adopted to reduce the degree of unfairness. Here we suggest that launching a preferential policy for pupils only with Southeast Asian mothers rather than with mainland China mothers would be appropriate, especially when budgets/resources are limited.

For students in the same year, the gaps in the test scores between the two groups are more pronounced in the lower grades. For example, the score differential of the 4th grade English in 2006 is significant, while the gap disappears for the 6th grade in the same year. In regard to different school subjects, significant test score differentials are found between the children with immigrant and native mothers for most courses. It is worth noting that the pupils with Southeast Asian mothers tend to perform badly in three subjects – Chinese, English and Math

– relative to native students. This further implies that remedial teaching for the lower-grade (say, 4th grade) pupils with Southeast Asian mothers might be required to focus on the three subjects. We have to mention that, as discussed in the previous section, in addition to the mother's nationality, family economic factors play an essential role in shrinking the gaps as well.

It is still unclear whether there is a significant academic performance differential between native students and pupils with immigrant mothers in the middle and high schools. Will the gaps then decline or widen? How do decision-makers design a sophisticated policy to remove the learning obstacles for the students? We shall leave those topics to future research.

References

[1] Baron, R., Tom, D., & Cooper, H. (1985). *Social Class, Race, and Teacher Expectations.* In J. Dusek (Eds.), Teacher Expectancies, Hillsdale, NJ: Erlbaum.

[2] Bleakley, H., & Chin, A. (2004). Language Skills and Earnings: Evidence from Childhood Immigrants. *Review of Economics and Statistics,* 86, 481–496.

[3] Caplan, N., Whitmore, J.K., & Choy, M.H. (1989). *The Boat People and Achievement in America.* Ann Arbor MI: The University of Michigan Press.

[4] Capps, R., Fix, M., Ost, J., Reardon-Anderson, J., & Passel, J. (2004). *The Health and Well-being of Young Children of Immigrants.* Washington DC: Urban Institute Press.

[5] Campbell, J.M., Hombo, C.M., and Mazzeo, J. (2000). *NAEP 1999 Trends in Academic Progress: Three Decades of Student Performance.* NCES 2000469.

[6] Chen H.W., Yang, S.H., Li, G.H., He, H.F., & Lan, X.C. (2007). *Strategies on Elementary School Life Adaption for Children With Immigrant Mothers: An Empirical Study of Three Elementary Schools in Chiayi County.* National Academy for Educational Research, 363–396. The material can be found at the following website: http://www.naer.edu.tw/mediafile/fdownload/369/582/2007-8-24-13-52-56-582.pdf. (In Chinese)

[7] Chuang, H.L., Hsieh, N., & Lin, E.S. (2010). Labour Market Activity of Foreign Spouses in Taiwan: Employment Status and Choice of Employment Sector. *Pacific Economic Review,* 15(4), 505–531.

[8] Cohen, Y., & Haberfeld, Y. (2003). Economic Assimilation among Children of Israeli Immigrants in the US. *International Migration,* 41(4), 141–160.

[9] Coleman, J., Campbell, E., Hobson, C., McPartland, J., Mood, A., Weinfeld, F.D., & York, P. (1996). *Equality of Educational Opportunity.* Washington, DC: U.S. Government Printing Office.

[10] Conger, D., Schwartz, A.E., & Stiefel, L. (2007). Immigrant and Native-born Differences in School Stability and Special Education: Evidence from New York City. *International Migration Review,* 41(2), 403–432.

[11] Cook, M., and Evans, W. (2000). Families or Schools? Explaining the Convergence in White and Black Academic Performance. *Journal of Labor Economics,* 18(4), 729–754.

[12] Cosden, M., Zimmer, J., Reyes, C., & del Rosario Gutierrez, M. (1995). Kindergarten Practices and First Grade Achievement for Latino Spanish-speaking, Latino English-speaking and Anglo Students. *Journal of School Psychology,* 33, 123–141.

[13] Diego, M.A., Field, T.M., & Sanders, C.E. (2003). Academic Performance, Popularity, and Depression Predict Adolescent Substance Use. *Adolescence,* 38, 35–42.

[14] Dusek, J.B. (1975). Do Teachers Bias Children's Learning? *Review of Educational Research,* 45, 661–684.

[15] Ferguson, R. (2003). Teachers' Perceptions and Expectations and the Black-White Test Score Gap. *Urban Education,* 38(4), 460–507.

[16] Fernandez-Kelly, M.P., & Schauffler, R. (1994). Divided Fates: Immigrant Children in a Restructured U.S. Economy. *International Migration Review,* 28, 662–689.

[17] Fryer, R.G., & Levitt, S.D. (2004). Understanding the Black-White Test Score Gap in the First Two Years of School. *Review of Economics and Statistics,* 86, 551–560.

[18] Fryer, R.G., & Levitt, S.D. (2006). The Black-White Test Score Gap through Third Grade. *American Law and Economics Review,* 8(2), 249–281.

[19] Gibson, M.A. (1998). *Accommodation Without Assimilation: Sikh Immigrants in an American High School.* Ithaca NY: Cornell University Press.

[20] Glick, J.E. (2010). Connecting Complex Processes: A Decade of Research on Immigrant Families. *Journal of Marriage and Family,* 72, 498–515.

[21] Grissmer, D., Flanagan, A., & Williamson, S. (1998). *Why Did the Black-White Score Gap Narrow in the 1970's and 1980's?* In Jencks, C., & Phillips, M. (Eds.), The Black-White Test Score Gap, Washington, DC: The Brookings Institution, 182–228.

[22] Harker, K. (2001). Immigrant Generation, Assimilation, and Adolescent Psychological Well-Being. *Social Forces,* 79(3), 969–1004.

[23] Hedges, L.V., & Nowell, A. (1998). *Black-White Test Score Convergence Since 1965.* In Jencks, C., & Phillips, M. (Eds.), The Black-White Test Score Gap, Washington, DC: The Brookings Institution, 149–181.

[24] Hedges, L.V., & Nowell A. (1999). Changes in the Black-White Gap in Achievement Test Scores. *Sociology of Education,* 72, 111–135.

[25] Hernandez, D.J., & Charney, E. (1998). *From Generation to Generation: The Health and Well-Being of Children in Immigrant Families.* Washington DC: National Academy Press.

[26] Humphreys, L. (1988). Trends in Levels of Academic Achievement of Blacks and Other Minorities. *Intelligence,* 12, 231–260.

[27] Jain, A., & Belsky, J. (1997). Fathering and Acculturation: Immigrant Indian Families with Young Children. *Journal of Marriage and Family,* 59, 873–883.

[28] Jensen, J.M. (1997). *Risk and Protective Factors for Alcohol and Other Drug Use in Childhood and Adolescence.* In Fraser, M.W. (Eds.), Risk and Resilience in Childhood: An Ecological Perspective, Washington, DC: NASW Press.

[29] Kao, G. (1999). *Psychological Well-Being and Educational Achievement among Immigrant Youth. In Children of Immigrants: Health, Adjustment, and Public Assistance.* In Hernandez, D.J. (Eds.), Washington, DC: National Academy Press, 410–477.

[30] Kao, G., & Tienda, M. (1995). Optimism and Achievement: The Educational Performance of Immigrant Youth. *Social Science Quarterly,* 76(1), 1–19.

[31] Krueger, A., & Whitmore, D. (2001). *Would Smaller Classes Help Close the Black White Achievement Gap?* Industrial Relations Section, Princeton University, working paper no. 451.

[32] Lareau, A. (1989). *Home Advantage: Social Class and Parental Intervention in Elementary Education.* London: Falmer Press.

[33] Leidy, M.S., Parke, R.D., Coltrane, S., & Duffy, S. (2009). Positive Marital Quality, Acculturative Stress, and Child Outcomes Among Mexican Americans. *Journal of Marriage and Family,* 71, 833–847.

[34] Lightfoot, S. (1978). *Worlds Apart: Relationships between Families and Schools.* New York: Basic Books.

[35] Neal, D.A. (2005). *Why Has Black-White Skill Convergence Stopped?* NBER Working Paper No. 11090.

[36] Nowell, A., & Hedges, l.V. (1998). Trends in Gender Differences in Academic Achievement from 1960–1994: An Analysis of Differences in Mean, Variance, and Extreme Scores. *Sex Roles,* 39, 21–43.

[37] Oh, S., & Min, P.G. (2011). Generation and Earnings Patterns Among Chinese, Filipino, and Korean Americans in New York. *International Migration Review*, 45, 852–871.

[38] Penner, A.M., & Paret, M. (2008). Gender Differences in Mathematics Achievement: Exploring the Early Grades and the Extremes. *Social Science Research,* 37, 239–253.

[39] Phillips, M., Crouse, J., & Ralph, J. (1998). *Does the Black-White Test Score Gap Widen After Children Enter School?* In Jencks C. & Phillips M. (Eds.), The Black-White Test Score Gap, Washington, DC: The Brookings Institution, 229–272.

[40] Portes, A., & Rumbaut, R.G. (2001). *Legacies: The Story of the Immigrant Second Generation.* Berkeley: University of California Press.

[41] Portes, A., & Zhou, M. (1993). The New Second Generation: Segmented Assimilation and Its Variants. *Annals of the American Academy of Political and Social Sciences*, 530, 74–96.

[42] Rong, X.L., & Grant, L. (1992). Ethnicity, Generation, and School Attainment of Asians, Hispanics and Non-Hispanic Whites. *The Sociological Quarterly*, 33(4), 625–636.

[43] Rosenthal, A.S., Baker, K., & Ginsburg, A. (1983). The Effect of Language Background on Achievement and Learning among Elementary School Students. *Sociology of Education*, 56, 157–169.

[44] Rumbaut, R.G. (1997). Assimilation and Its Discontents: Between Rhetoric and Reality. *The International Migration Review*, 31(4), 923–960.

[45] Schnepf, S.V. (2004). *How Different Are Immigrants? A Cross-Country and Cross-Survey Analysis on Educational Achievement.* Discussion Paper No. 1398.

[46] Schwartz, A.E., & Stiefel, L. (2006). Is There a Nativity Gap? New Evidence on the Academic Performance of Immigrant Students. *Education Finance and Policy,* 1(1), 17–49.

[47] Stumpf, H., & Stanley, J.C. (1996). Gender–Related Differences on the College Board's Advanced Placement and Achievement Tests, 1982–1992. *Journal of Educational Psychology,* 88, 353–364.

[48] Su, J.F. (2006). The Comparison of Birth Rate between Native Taiwanese Female Spouses and Immigrant Female Spouses: A Survey on the Relation between Low Fertility and Immigrant Female Spouses in Taiwan. *Inservice Education Bulletin,* 23(5), 41–52. (In Chinese)

[49] Sutherland, I., & Shepherd, J.P. (2001). Social Dimensions of Adolescent Substance Use. *Addiction,* 96, 445–458.

[50] Tsay, W.J. (2006). The Educational Attainment of Second-Generation Mainland Chinese Immigrants in Taiwan. *Journal of Population Economics,* 19, 749–767.

[51] Tsai, S.L., & Chiu, H.Y. (1993). Educational Attainment in Taiwan: Comparisons of Ethnic Groups. *Proceedings of the National Science Council, ROC Part C: Humanities and Social Science,* 3(2), 188–202.

[52] Van Amersfoort, J.M.M. (1974). *Immigratie en Minderheidsvorming, Een Analyse van de Nederlandse Situatie 1945–1973.* Dissertation, University of Amsterdam, Alphen aan den Rijn, Samsom Uitgeverij.

[53] van Ours, J.C., & Veenman, J. (2003). The Educational Attainment of Second-Generation Immigrants in the Netherlands. *Journal of Population Economics,* 16(4), 711–737.

[54] Waters, M.C. (1999). *Black Identities: West Indian Immigrant Dreams and American Realities.* New York: Russell Sage Foundation.

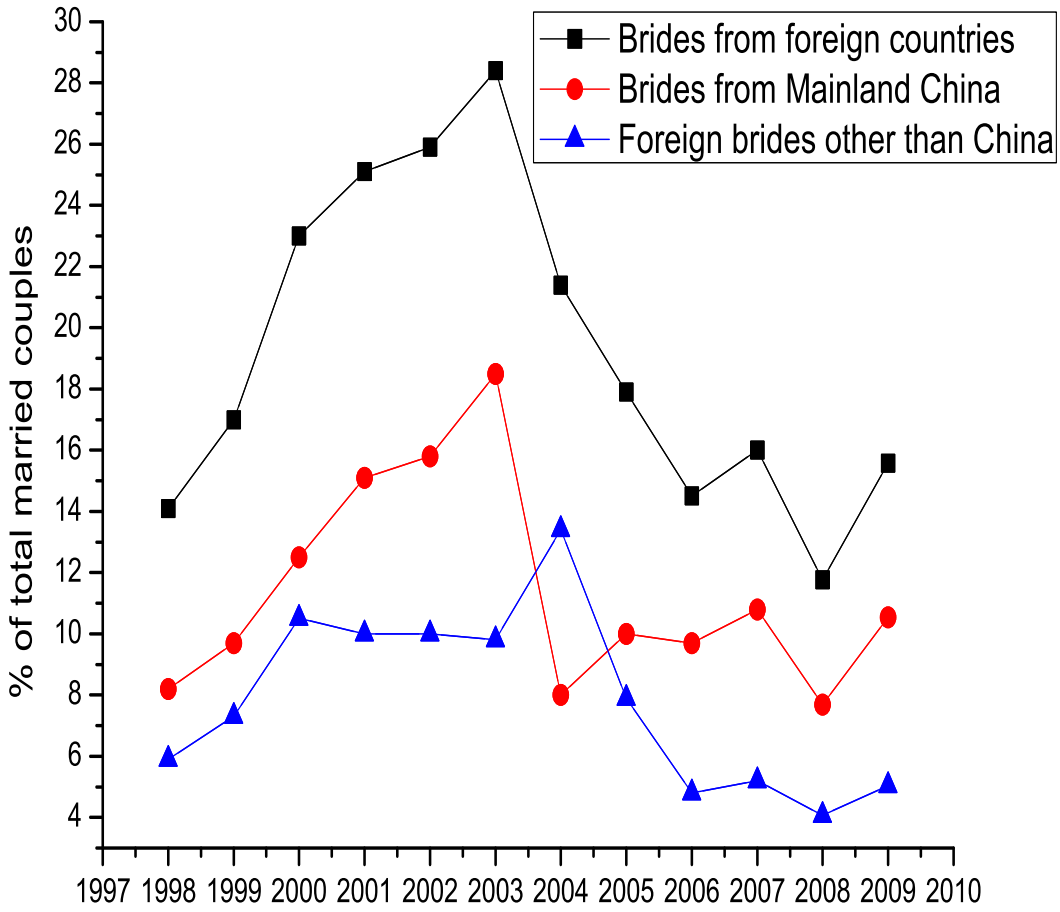

Figure 1: Proportion of Foreign Brides in Total Married Couples: 1998–2009

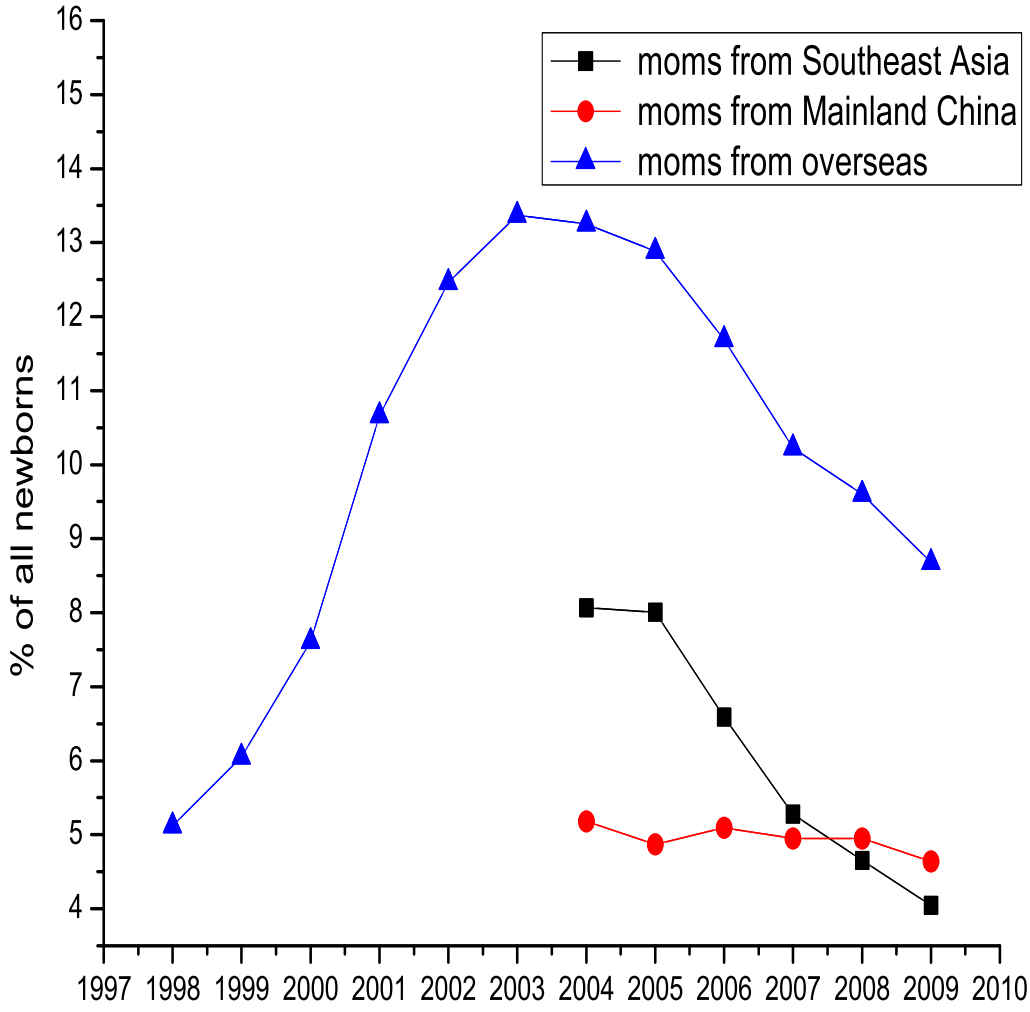

Figure 2: Proportion of Newborns with Immigrant Mothers: 1998–2009

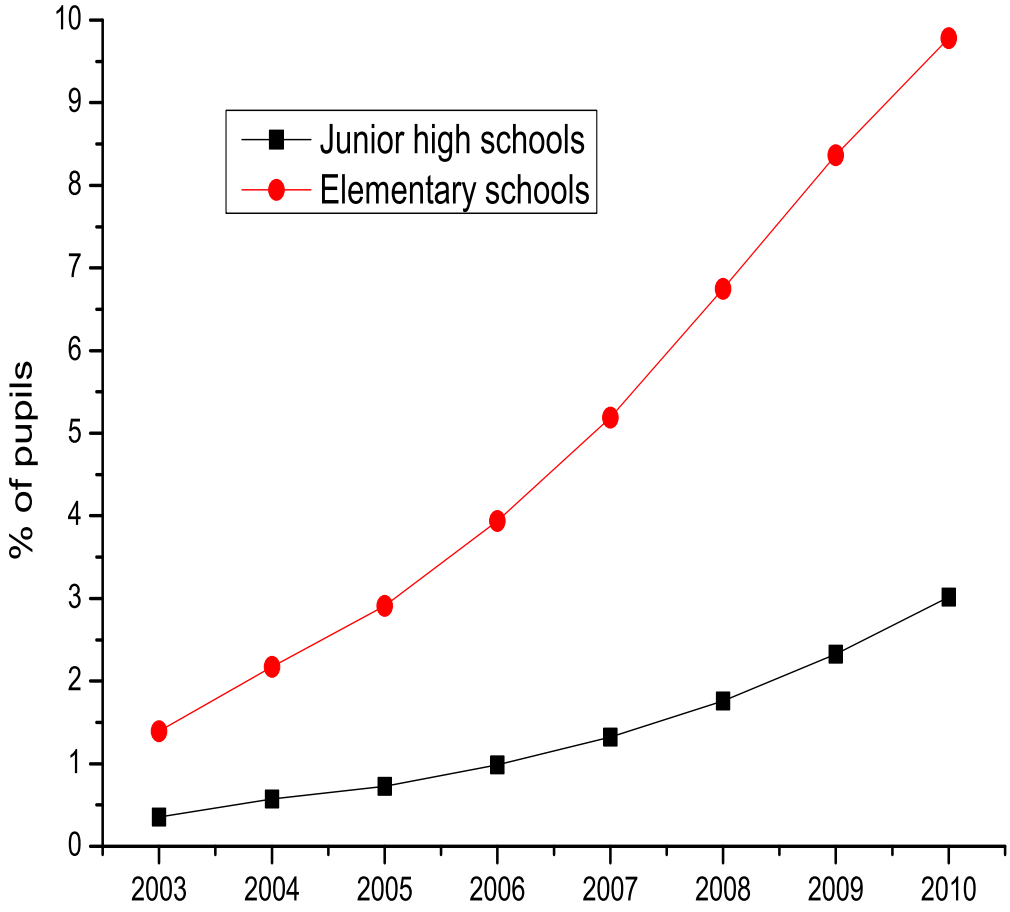

Figure 3: Proportion of Pupils with Immigrant Mothers: 2003–2010

Table 1: Description of Variables

Variables	Description of Variables
Score	Test scores ranging from 0 to 100.
Mother's nationality (I)	0 for native Taiwanese, and 1 for immigrant mothers (including from mainland China and Southeast Asia).
Mother's nationality (II)	Two dummies for mainland China and Southeast Asian mothers, respectively, with natives being the reference group.
Gender	0 for female and 1 for male.
Sibling	The number of siblings.
Parents' married status	Married and living together is 1, other status is 0.
Parents' education level (2005, 06)	The seven types of parental education level include no education, elementary school, junior high school, senior high school, college, masters, and doctoral degree.
Parents' education level (2007)	The seven types of parental education level include no education, elementary school, junior high school, senior high school, junior college, college, and masters.
Parents' occupation (2005, 2006)	The eight types of parental occupation include agriculture, industry, business, government employee, military, teacher, professional, and others.
Parents' occupation (2007)	The nine types of parental occupation include senator or minister, professional or CEO, manager or the leader of government offices, team leader or government officer, technical staff, office worker, agroforestry, non-technical staff, and others.

Note:
The classification of parental education level and occupation in the 2005 and 2006 surveys is slightly different from that in 2007.

Table 2: Sample Means and Standard Errors of Test Scores by Subject, Grade and Year

			Number of Immigrant Mothers	Number of Native Mothers	% of Pupils with Immigrant Mothers	Pupils with Immigrant Mothers	Pupils with Native Mothers
Chinese	2005	6th	366	9491	3.71%	70.0592	74.1050
						(16.5771)	(13.6846)
	2006	4th	788	7109	9.98%	62.1510	69.0537
						(17.0127)	(15.4157)
		6th	327	7552	4.15%	64.3076	66.0267
						(14.3009)	(13.8900)
	2007	4th	151	2851	5.03%	66.1884	72.8224
						(20.2117)	(15.4317)
		6th	124	4616	2.62%	70.4301	72.1533
						(15.4843)	(13.7204)
English	2005	6th	196	4666	4.03%	76.70918	84.00879
						(20.0627)	(16.3001)
	2006	4th	806	6858	10.52%	78.2258	84.0592
						(16.7905)	(14.9757)
		6th	319	7304	4.18%	80.5016	83.6788
						(16.0012)	(15.7489)
	2007	4th	148	2746	5.11%	76.2458	87.2371
						(18.2608)	(13.9909)
		6th	149	4446	3.24%	75.67114	82.77384
						21.3578	17.24566
Math	2005	6th	394	9409	4.02%	53.8748	57.1779
						(19.8479)	(57.1779)
	2006	4th	801	6891	10.41%	46.2703	52.6877
						(17.9935)	(17.8847)
		6th	317	7356	4.13%	55.9411	59.2963
						(20.4010)	(20.5720)
	2007	4th	133	2750	4.61%	52.5063	59.7773
						(18.0818)	(17.4053)
		6th	124	4367	2.76%	53.6626	59.7407
						(22.0005)	(21.4153)
Science	2006	4th	757	6928	9.85%	44.7854	47.9441
						(16.8755)	(17.9187)
		6th	308	7249	4.08%	63.9444	65.2136
						(12.9459)	(13.2365)
	2007	4th	153	2780	5.22%	54.5985	61.8487
						(15.1505)	(14.5734)
		6th	112	4464	2.45%	60.2381	61.9631
						(17.1241)	(17.4535)
Society	2006	6th	309	7068	4.19%	65.0773	66.3189
						(14.0060)	(15.4801)
	2007	6th	122	4421	2.69%	60.3643	63.3180
						(16.9393)	(15.4084)

Note: Standard deviations are in parentheses.

Table 3: Parents' Education Level and Marital Status

			Schooling of Native Mothers	Schooling of NTO's Mothers	Schooling of Native Fathers	Schooling of NTO's Fathers	Marital Status of Native Parents	Marital Status of NTO's Parents
Chinese	2005	6th	11.8704	11.6858	12.1505	12.1038	0.8293	0.7541
			(3.1427)	(4.0276)	(3.4876)	(4.2330)	(0.3763)	(0.4312)
	2006	4th	12.4278	11.1320	12.6568	11.8401	0.8356	0.7881
			(3.6798)	(4.5477)	(4.0448)	(4.3858)	(0.3707)	(0.4089)
		6th	12.1335	10.8532	12.5518	11.6147	0.8309	0.7798
			(3.0858)	(3.8384)	(3.4582)	(3.7733)	(0.3749)	(0.4150)
	2007	4th	12.6847	10.5828	12.7141	11.1589	0.8860	0.8411
			(3.1075)	(4.4518)	(3.4203)	(4.0728)	(0.3179)	(0.3668)
		6th	12.1893	11.0161	12.3822	10.9194	0.8629	0.7742
			(2.8877)	(3.8084)	(3.1314)	(3.5098)	(0.3440)	(0.4198)
English	2005	6th	11.7795	11.3367	12.1470	12.0867	0.8423	0.7500
			(3.1249)	(3.8775)	(3.4986)	(4.0354)	(0.3645)	(0.4341)
	2006	4th	12.4682	11.1179	12.7442	11.7581	0.8387	0.7940
			(3.7352)	(4.5536)	(4.0564)	(4.4459)	(0.3678)	(0.4046)
		6th	11.9670	11.1254	12.3343	11.7179	0.8301	0.7837
			(3.0136)	(3.8301)	(3.3926)	(3.7745)	(0.3756)	(0.4124)
	2007	4th	12.6770	11.4865	12.8132	11.8176	0.8798	0.8514
			(3.1395)	(4.4439)	(3.4655)	(3.9141)	(0.3252)	(0.3569)
		6th	12.1397	11.0738	12.3329	11.302	0.8684	0.7383
			(2.9514)	(3.6946)	(3.1295)	(3.5994)	(0.3381)	(0.4411)
Math	2005	6th	11.7478	11.3223	12.0557	11.9899	0.8326	0.7614
			(3.1098)	(3.9060)	(3.4801)	(4.1129)	(0.3733)	(0.4268)
	2006	4th	12.4510	11.2684	12.6616	12.2385	0.8415	0.7803
			(3.7458)	(4.7462)	(4.0634)	(4.6585)	(0.3652)	(0.4143)
		6th	12.1165	10.8360	12.5377	11.6088	0.8308	0.7855
			(3.0861)	(3.7943)	(3.4677)	(3.7810)	(0.3750)	(0.4111)
	2007	4th	12.7276	11.0376	12.8186	11.4361	0.8880	0.8346
			(3.0704)	(4.4456)	(3.4154)	(3.9550)	(0.3154)	(0.3730)
		6th	12.1461	10.8468	12.3900	11.2097	0.8665	0.7500
			(2.8619)	(4.1399)	(3.1106)	(3.7117)	(0.3402)	(0.4348)
Science	2006	4th	12.4618	11.1876	12.6493	11.6328	0.8479	0.7649
			(3.6964)	(4.6700)	(4.0672)	(4.4677)	(0.3592)	(0.4244)
		6th	12.1069	10.8214	12.5190	11.5617	0.8303	0.7792
			(3.0964)	(3.8026)	(3.4570)	(3.7702)	(0.3754)	(0.4154)
	2007	4th	12.7741	10.9346	12.8547	11.3007	0.8960	0.8627
			(3.0820)	(4.4064)	(3.4717)	(4.0783)	(0.3053)	(0.3452)
		6th	12.1931	10.6161	12.3327	11.5000	0.8649	0.7946
			(2.8847)	(4.1335)	(3.1350)	(3.5438)	(0.3418)	(0.4058)
Society	2006	6th	12.1012	10.9126	12.5233	11.6796	0.8301	0.7832
			(3.0890)	(3.7782)	(3.4713)	(3.8280)	(0.3756)	(0.4128)
	2007	6th	12.1590	11.3853	12.2968	11.3279	0.8699	0.8443
			(2.8511)	(3.6260)	(3.1120)	(3.3463)	(0.3364)	(0.3641)

Notes: Standard deviations are in parentheses. "Schooling" is measured by the years of schooling. "Marital Status" reports the proportion of parents married and living together. "Native" stands for native Taiwanese kids and "NTO" represents the new Taiwanese offspring.

Table 4: Summary Statistics for the 4th Grade Chinese in 2007

	Native Pupils		NTO		Mainland China		Southeast Asia	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Male	0.48	0.50	0.54	0.50	0.54	0.50	0.55	0.50
Sibling	2.74	1.37	2.62	1.43	2.47	1.31	2.78	1.55
Married	0.89	0.32	0.84	0.37	0.82	0.39	0.86	0.35
Fathers' education								
no education	0.02	0.13	0.07	0.25	0.08	0.27	0.05	0.23
elementary	0.04	0.20	0.12	0.33	0.03	0.16	0.22	0.42
junior high	0.19	0.39	0.25	0.43	0.23	0.42	0.26	0.44
senior high	0.32	0.47	0.26	0.44	0.28	0.45	0.25	0.43
junior college	0.10	0.30	0.07	0.26	0.10	0.31	0.04	0.20
college	0.23	0.42	0.17	0.37	0.17	0.38	0.16	0.37
master	0.10	0.30	0.07	0.25	0.12	0.32	0.01	0.12
Mothers' education								
no education	0.01	0.11	0.15	0.35	0.10	0.31	0.19	0.40
elementary	0.04	0.19	0.09	0.29	0.05	0.22	0.14	0.35
junior high	0.17	0.38	0.23	0.42	0.22	0.42	0.23	0.43
senior high	0.37	0.48	0.23	0.42	0.28	0.45	0.16	0.37
junior college	0.11	0.32	0.09	0.29	0.14	0.35	0.04	0.20
college	0.25	0.43	0.19	0.39	0.15	0.36	0.22	0.42
master	0.05	0.22	0.03	0.18	0.05	0.22	0.01	0.12
Fathers' occupation								
senator or minister	0.01	0.09	0.01	0.11	0.01	0.11	0.01	0.12
professional or CEO	0.20	0.40	0.15	0.36	0.17	0.38	0.14	0.35
manager or the leader of government offices	0.08	0.28	0.06	0.24	0.09	0.29	0.03	0.16
team leader or government officer	0.18	0.39	0.13	0.34	0.14	0.35	0.12	0.33
technical staff	0.25	0.43	0.30	0.46	0.29	0.46	0.32	0.47
office worker	0.05	0.22	0.03	0.18	0.05	0.22	0.01	0.12
agroforestry	0.04	0.19	0.05	0.22	0.01	0.11	0.10	0.30
non-technical staff	0.10	0.30	0.10	0.30	0.12	0.32	0.08	0.28
others	0.08	0.28	0.15	0.36	0.12	0.32	0.19	0.40
Mothers' occupation								
senator or minister	0.00	0.05	0.01	0.08	0.01	0.11	0.00	0.00
professional or CEO	0.09	0.28	0.12	0.33	0.15	0.36	0.08	0.28
manager or the leader of government offices	0.08	0.27	0.05	0.22	0.05	0.22	0.05	0.23
team leader or government officer	0.16	0.36	0.11	0.31	0.13	0.34	0.08	0.28
technical staff	0.19	0.39	0.23	0.42	0.22	0.42	0.25	0.43
office worker	0.08	0.27	0.06	0.24	0.06	0.25	0.05	0.23
agroforestry	0.02	0.13	0.03	0.16	0.00	0.00	0.05	0.23
non-technical staff	0.22	0.42	0.27	0.45	0.26	0.44	0.29	0.46
others	0.16	0.37	0.13	0.33	0.12	0.32	0.14	0.35
Sample sizes	2,851		151		78		73	

Note: "NTO" represents the new Taiwanese offspring.

Table 5: Regression Coefficients for the 4th Grade Chinese in 2007

	Native vs. Immigrant Mothers			Native vs. China & Southeast Asian Mothers		
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Foreign	-6.6340 ***	-4.4459 ***	-4.0549 ***			
	(1.3115)	(1.2790)	(1.2572)			
Mainland China				-2.3096	-1.0890	-1.2096
				(1.7991)	(1.7201)	(1.6888)
Southeast Asian countries				-11.2547 ***	-8.1837 ***	-7.2670 ***
				(1.8581)	(1.8103)	(1.7893)
Male		-1.3470 **	-1.4437 ***		-1.3521 **	-1.4430 ***
		(0.5464)	(0.5382)		(0.5458)	(0.5377)
Sibling		-2.0951 ***	-1.9966 ***		-2.0839 ***	-1.9885 ***
		(0.1995)	(0.1963)		(0.1993)	(0.1961)
Married		4.5250 ***	4.2360 ***		4.5684 ***	4.2787 ***
		(0.8501)	(0.8350)		(0.8492)	(0.8345)
Mothers' education						
elementary		2.5411	-0.0570		2.2648	-0.4726
		(2.4358)	(2.6138)		(2.4346)	(2.6166)
junior high		3.9374 *	0.9060		3.4799	0.3939
		(2.1386)	(2.3499)		(2.1417)	(2.3566)
senior high		7.9900 ***	3.2236		7.5014 ***	2.7055
		(2.0987)	(2.3306)		(2.1027)	(2.3375)
junior college		11.0823 ***	4.3370 *		10.5499 ***	3.8025
		(2.2062)	(2.4578)		(2.2110)	(2.4648)
college		10.1494 ***	3.3199		9.7250 ***	2.8884
		(2.1245)	(2.3995)		(2.1269)	(2.4034)
master		12.0684 ***	3.7282		11.5659 ***	3.2697
		(2.3946)	(2.7032)		(2.3978)	(2.7069)
Mothers' occupation						
senator or minister		-14.8491 ***	-9.3993 *		-15.2922 ***	-9.6577 *
		(5.0120)	(5.0566)		(5.0080)	(5.0531)
professional or CEO		-1.1347	-1.6271		-1.2031	-1.6727
		(1.1565)	(1.2143)		(1.1553)	(1.2134)
manager or the leader of government offices		4.4328 ***	2.5531 **		4.4408 ***	2.5912 **
		(1.2277)	(1.2626)		(1.2262)	(1.2616)
team leader or government officer		0.1379	-1.2749		0.1128	-1.2816
		(0.9750)	(1.0550)		(0.9738)	(1.0540)
technical staff		-0.0065	-0.2522		0.0075	-0.2254
		(0.9266)	(0.9558)		(0.9254)	(0.9550)
office worker		3.0173 **	1.7382		3.0173 **	1.7759
		(1.1875)	(1.2177)		(1.1860)	(1.2167)
agroforestry		-3.8683 *	-0.3006		-3.6411 *	-0.1710
		(2.1640)	(2.4494)		(2.1627)	(2.4477)
non-technical staff		1.0091	0.8718		1.0170	0.8975
		(0.8926)	(0.9177)		(0.8915)	(0.9169)
Fathers' education						
elementary			3.7603			4.3202 *
			(2.5055)			(2.5131)
junior high			5.2652 **			5.5724 **
			(2.2950)			(2.2962)
senior high			7.8187 ***			8.1241 ***
			(2.2754)			(2.2765)
junior college			10.5727 ***			10.8469 ***
			(2.4243)			(2.4245)
college			9.7373 ***			10.0095 ***
			(2.3437)			(2.3441)
master			12.7212 ***			12.9170 ***
			(2.4944)			(2.4933)
Fathers' occupation						
senator or minister			-13.2671 ***			-13.3021 ***
			(3.1409)			(3.1381)
professional or CEO			1.8480			1.8035
			(1.1800)			(1.1791)
manager or the leader of government offices			4.8227 ***			4.7188 ***
			(1.3967)			(1.3961)
team leader or government officer			3.7538 ***			3.7009 ***
			(1.2115)			(1.2106)
technical staff			2.2331 **			2.1666 *
			(1.1092)			(1.1085)
office worker			3.6045 **			3.4748 **
			(1.5949)			(1.5943)
agroforestry			-3.4084 *			-3.3852 *
			(1.8939)			(1.8922)
non-technical staff			0.1865			0.0883
			(1.2951)			(1.2945)
Constant	72.8224 ***	66.4583 ***	62.0545 ***	72.8224 ***	66.8534 ***	62.2352 ***
	(0.2941)	(2.3296)	(2.6028)	(0.2936)	(2.3307)	(2.6015)
Sample size	3002	3002	3002	3002	3002	3002
R square	0.0085	0.1171	0.1559	0.0125	0.1196	0.1577

Notes: Standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6: The Marginal Effect of Mothers' Nationality on Test Scores

			Foreign Mothers	Mainland China Mothers	Southeast Asian Mothers
			Model A	Model B	Model C
Chinese	2005	6th	-2.9733***	-0.6027	-5.1555***
			(0.6931)	(0.9900)	(0.9506)
	2006	4th	-4.6407***	0.7511	-6.1487***
			(0.5586)	(1.1408)	(0.6232)
		6th	-1.6239**	-1.1983	-1.9600*
			(0.7954)	(1.1793)	(1.0515)
	2007	4th	-4.0549 ***	-1.2096	-7.2670 ***
			(1.2572)	(1.6888)	(1.7893)
		6th	1.2566	4.0389 **	-1.6315
			(1.1778)	(1.6315)	(1.6615)
English	2005	6th	-5.6570***	-0.8052	-8.4033***
			(1.0975)	(1.7945)	(1.3596)
	2006	4th	-3.6246***	-0.3514	-4.7466***
			(0.5312)	(1.0056)	(0.6061)
		6th	-1.3310	1.3169	-3.0230***
			(0.8131)	(1.2817)	(1.0303)
	2007	4th	-8.4105 ***	-7.7123 ***	-9.1700 ***
			(1.1214)	(1.5265)	(1.5895)
		6th	-2.9903 **	-0.1929	-5.8140 ***
			(1.3007)	(1.8156)	(1.8239)
Math	2005	6th	-2.1425**	1.6271	-4.7500***
			(0.9196)	(1.4178)	(1.1842)
	2006	4th	-4.2019***	1.8628	-6.2217***
			(0.6517)	(1.2422)	(0.7397)
		6th	-2.7776**	-2.5810	-2.9401*
			(1.1952)	(1.7514)	(1.5963)
	2007	4th	-5.0808 ***	-5.4012 **	-4.7635 **
			(1.5212)	(2.1080)	(2.0981)
		6th	-2.5076	0.4416	-5.8100 **
			(1.8574)	(2.5248)	(2.6678)
Science	2006	4th	-1.8221***	0.5308	-2.6635***
			(0.6893)	(1.2821)	(0.7902)
		6th	-1.0895	-1.5417	-0.7194
			(0.7798)	(1.1477)	(1.0406)
	2007	4th	-4.7724 ***	-1.3952	-7.9623 ***
			(1.1796)	(1.6550)	(1.6104)
		6th	-0.2601	0.9122	-1.2575
			(1.6012)	(2.3294)	(2.1531)
Society	2006	6th	-0.8805	-0.5037	-1.1779
			(0.9069)	(1.3459)	(1.1995)
	2007	6th	-1.5926	1.1470	-4.4456 **
			(1.3396)	(1.8586)	(1.8960)

Notes: The numbers in Model A are summarized in the same fashion of Model 3 in Table 5. Similarly, Models B and C are obtained based on Model 6 in Table 5. Standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7: ANOVA Analysis of Test Scores by Subject, Grade and Year

			Pupils with Immigrant Mothers	Pupils with Native Mothers	F value	Mainland China Mothers	F value	Southeast Asia Mothers	F value
Chinese	2005	6th	70.0592	74.1050	30.28***	73.65079	0.19	66.7685	53.02***
			(16.5771)	(13.6846)		(14.5770)		(17.6222)	
	2006	4th	62.1510	69.0537	139.20***	68.9153	0.01	60.3181	180.12***
			(17.0127)	(15.4157)		(16.0767)		(16.8069)	
		6th	64.3076	66.0267	4.79**	64.772	1.13	63.9511	4.02**
			(14.3009)	(13.8900)		(13.7947)		(14.7048)	
	2007	4th	66.1884	72.8224	25.59***	70.5128	1.65	61.5677	36.69***
			(20.2117)	(15.4317)		(17.6151)		(21.8478)	
		6th	70.4301	72.1533	1.89	74.0741	1.21	66.6667	9.58***
			(15.4843)	(13.7204)		(13.7183)		(16.3923)	
English	2005	6th	76.70918	84.00879	36.96***	84.0000	0.00	72.6587	58.53***
			(20.0627)	(16.3001)		(16.5032)		(20.7672)	
	2006	4th	78.2258	84.0592	106.56***	82.3539	2.47	76.8543	125.61***
			(16.7905)	(14.9757)		(15.6623)		(16.9397)	
		6th	80.5016	83.6788	12.42***	84.3496	0.22	78.0867	24.07***
			(16.0012)	(15.7489)		(15.5165)		(15.8652)	
	2007	4th	76.2458	87.2371	83.68***	78.3717	28.69***	74.0017	60.67***
			(18.2608)	(13.9909)		(18.2771)		(18.0992)	
		6th	75.67114	82.77384	24.04***	80.5743	1.17	70.8333	34.84***
			21.3578	17.24566		(18.6231)		(22.8564)	
Math	2005	6th	53.8748	57.1779	11.88***	59.5000	2.45	50.0285	33.70***
			(19.8479)	(57.1779)		(19.3291)		(19.3110)	
	2006	4th	46.2703	52.6877	92.27 ***	53.4402	0.34	43.9632	133.08***
			(17.9935)	(17.8847)		(18.0981)		(17.3549)	
		6th	55.9411	59.2963	8.09 ***	56.2943	2.95*	55.6581	5.38**
			(20.4010)	(20.5720)		(20.5433)		(20.3405)	
	2007	4th	52.5063	59.7773	22.06 ***	53.4722	8.43***	51.5547	14.54***
			(18.0818)	(17.4053)		(19.3039)		(16.8836)	
		6th	53.6626	59.7407	9.70***	57.7564	0.55	49.1525	14.22***
			(22.0005)	(21.4153)		(22.4004)		(20.8158)	
Science	2006	4th	44.7854	47.9441	21.44***	47.61905	0.06	43.7954	28.15***
			(16.8755)	(17.9187)		(17.3012)		(16.6263)	
		6th	63.9444	65.2136	2.72*	63.59351	2.00	64.2218	0.94
			(12.9459)	(13.2365)		(13.0514)		(12.8932)	
	2007	4th	54.5985	61.8487	35.74 ***	59.4246	1.94	50.3086	49.38***
			(15.1505)	(14.5734)		(14.5017)		(14.4874)	
		6th	60.2381	61.9631	1.07	61.7647	0.01	58.9618	1.78
			(17.1241)	(17.4535)		(17.6050)		(16.7503)	
Society	2006	6th	65.0773	66.3189	1.92	65.5556	0.32	64.7111	1.86
			(14.0060)	(15.4801)		(13.8329)		(14.1657)	
	2007	6th	60.3643	63.3180	4.34**	63.40502	0.00	57.2222	9.22**
			(16.9393)	(15.4084)		(16.0636)		(17.3760)	

Notes: Standard deviations are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.