The Pennsylvania State University

The Graduate School

College of Education

EXAMINING THE IMPACT OF MOTHER’S IMMIGRATION STATUS ON TAIWAN MIDDLE SCHOOL STUDENTS’ ACADEMIC ACHIEVEMENT

A Dissertation in

Educational Leadership

by

Chao-Jui Huang

© 2018 Chao-Jui Huang

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

August 2018
The dissertation of Chao-Jui Huang was reviewed and approved* by the following:

Roger C. Shouse  
Associate Professor of Education  
Dissertation Advisor  
Chair of Committee

Edward J. Fuller  
Associate Professor of Education  
Head of the Educational Leadership Graduate Program

Maryellen Schaub  
Assistant Professor of Education  
Professor-in-Charge, Education and Public Policy

Kevin Kinser  
Department Head, Education Policy Studies  
Professor of Education

Wei-Fan Chen  
Associate Professor, Information Sciences and Technology

* Signatures are on file in the Graduate School
ABSTRACT

Taiwan has been home for a large number of new immigrant mothers and their families in the past decade. In 2016, nearly 13% of Taiwan’s middle schools students were born to new immigrant mothers (Ministry of Education, 2016). To gain a better understanding of how having immigration mothers (non-Taiwanese citizens or permanent residents) affects children’s school performance, this study set out to examine the relationship between mother’s immigration status and middle school students’ academic achievement. This study applied Huang and Tang’s (2007) model regarding the impact of mother’s low educational attainment, and investigated how mother’s immigration status, along with other characteristics of children’s behaviors, including children’s language acquisition ability, children’s school adaption, children’s interpersonal skills, and children’s cultural acquisition ability, affect their academic achievement.

The results of the retrospective longitudinal analyses are based on Taiwan Educational Panel Survey (TEPS), and indicated that children of non-Taiwanese citizen mothers tend to outperform their peers of Taiwanese citizen mothers, particularly those having mainland Chinese mothers, and those living in urban areas of Taiwan. The results also showed that middle school students who have better interpersonal skills/friendships and better cultural acquisition ability are more likely to gain higher achievement levels. With the findings in this study, middles school leaders and practitioners are to ensure diversity in school, to encourage meaningful interactions and engagement among students from diverse cultural and family backgrounds, to support educational resources and incentives provided to children of new immigrant mothers, and to promote civil rights for new immigrant mothers and their families.
# TABLE OF CONTENTS

LIST OF FIGURES ..................................................................................................................vii

LIST OF TABLES ..........................................................................................................................viii

Chapter 1: INTRODUCTION .......................................................................................................1

   Statement of Problem .............................................................................................................2

   Definition of Terms ...............................................................................................................5

   Purpose of Study and Research Questions ...........................................................................6

   Significance of the Study ......................................................................................................7

   Conceptual Framework .........................................................................................................8

   Methodology, Design, Population and Sample ...................................................................10

   Limitations ............................................................................................................................11

   Summary .................................................................................................................................13

Chapter 2: REVIEW OF LITEATURES ......................................................................................16

   Evolution of Taiwan’s Immigration Policy ..........................................................................17

   Impact of Mother’s Immigration Status ..............................................................................20

   Impact of Other Identified Variables ..................................................................................30

      Impact of Children’s Language Acquisition .....................................................................30

      Impact of Children’s School Adaption .............................................................................32

      Impact of Children’s Interpersonal Skills .......................................................................33

      Impact of Children’s Cultural Acquisition .......................................................................34

   Theoretical Foundations .......................................................................................................36

   Summary and Conclusion ....................................................................................................37
Chapter 3: METHODOLOGY .................................................................40

Research Design Overview........................................................................40

General Review of Database and Participants..............................................44

Research Design—Participants and Instrument ............................................45

Participant—Children of low-educated mothers...........................................46

Instruments—Survey questions construction for dependent variable............46

Instruments—Survey questions construction for independent variables........47

Mother’s Immigration Status.......................................................................49

Demographic information of the sample......................................................51

Children’s language acquisition...............................................................52

Children’s school adaption .......................................................................53

Children’s interpersonal skills ..................................................................53

Children’s cultural acquisition...............................................................54

Data Analyses............................................................................................55

Data screening and clustering procedure Results ........................................55

Main Analyses...........................................................................................57

Chapter 4: RESULTS AND ANALYSES..................................................59

Bivariate analyses. .....................................................................................60

The results of logistic regression Analysis ...............................................61

Binomial regression....................................................................................61

Multinomial regression..............................................................................63

Interactive effects between independent variables....................................63

Students obtaining excellent academic achievement...............................67
Review and summary of results...........................................................................................................71

Significance of mother’s immigration status..................................................................................67

Significance of children’s interpersonal skills..............................................................................72

Significance of children’s cultural acquisition..............................................................................72

Chapter 5: DISCUSSION..................................................................................................................74

Variables with Significant Results.................................................................................................74

Mother’s Immigration status..........................................................................................................76

Children’s interpersonal skills......................................................................................................81

Children’s cultural acquisition......................................................................................................82

Interactive effect between significant variables .............................................................................83

Implication for middle school leaders and practitioners.................................................................85

Limitations of the study..................................................................................................................90

Recommendation for future research............................................................................................91

Summary and conclusion.................................................................................................................93

References.........................................................................................................................................97

Appendix A: The Contents of the Questionnaires..........................................................................111

Appendix B: TEPS Student Survey Questions..............................................................................113
LIST OF FIGURES

Figure 1. Impact of mother’s immigration status and other characteristic of students’ behaviors..9

Figure 2. Conceptual Framework based on Huang and Tang’s (2007).................................36
LIST OF TABLES

Table 1. Descriptive statistics for dependent variable..........................................................41
Table 2. Descriptive statistics of independent variables (before clustering)..........................42
Table 3. List of independent variables and selected survey questions..................................48
Table 4. Number of low-educated mothers........................................................................51
Table 5. School Districts of all children................................................................................51
Table 6. Descriptive statistics for clustered independent variables (clustered variables).......56
Table 7. Correlation matrix between predictor and outcome variables...............................60
Table 8. Regression coefficient and odds ratio for factor associated with student’s obtaining high academic achievement level.........................................................................................62
Table 9. Regression coefficient and odds ratio for factor associated with student’s academic achievement being in a higher achievement level...........................................................................64
Table 10. Regression coefficient and for factors associated with student’s obtaining higher academic achievement level........................................................................................................65
Table 11. Regression coefficient and odds ratio for obtaining excellent academic achievement and other associated factors............................................................................................68
Table 12. Regression coefficient and odds ratio for obtaining excellent academic achievement and other associated factors..................................................................................................70
CHAPTER 1

Introduction

As a country located at the center of East Asia Island Chain, Taiwan has been a destination for a large number of immigrants from mainland China and Southeast Asia after its economic booms between 1980s-1990s. Since the late 2000s, the number of new immigrant wives, referred in this study as new immigrant mothers (“Wai ji xin niang” or “xin zhu min”), has also increased rapidly (Lin, 2013). Among new immigrant mothers, 65% of them come from mainland China, 19% from Vietnam, and 5% from Indonesia (National Immigration Agency, 2017). As the result, in 2016, nearly 13% of middle school students were born to non-Taiwanese mothers. Bélanger et al. (2010) argued that Taiwan holds the Asia record of having the highest proportion of families that involve new immigrant mothers.

The majority of new immigrant mothers in Taiwan also have low educational attainment, the completion of middle school in their home countries. Among new immigrant mothers, about 74% Southeast Asian mothers immigrated to Taiwan with only completion of middle-school education or lower in their home countries. For mainland Chinese immigrant mothers, only about 63% of them attained middle school or lower education level (Ministry of the Interior, 2015). That said, the group of low-educated mothers (completion of middle school) in Taiwan consists of both native Taiwanese mothers, and a large number of new immigrant mothers from Southeast Asia and mainland China. Therefore, the research framework regarding low-educated mothers, new immigrant mothers, and their children’s academic achievement in Taiwan have been shifted for an intentional focus on new immigrant mothers and their children in recent years (Cheng, 2015).
However, Chen et al. (2008) argued that the stigma against this group, particularly Southeast Asian immigrant mothers, remains strong not only because of their low educational attainment, but also their race, ethnicity, disadvantaged financial status, hereditary, and cultural difference. For mainland Chinese immigrant mothers, the stigma may exist, but is less serious thanks to their cultural familiarity, and the nature and characteristics of their marriages (Wu, 2009). In response to the prevalent stigma against new immigrant mothers, Taiwan’s Ministry of Education (MOE) and the Central Government are committed to equity and diversity in recent years. In 2015, Taiwan MOE prioritized a long-term educational development plan (火炬計畫) for new immigrant mothers and their children, including the promotion of career counseling, cultural diversity, and language learning for new immigrant mothers. MOE also urged local schools to provide a more comprehensive educational counseling for children of new immigrant mothers in both urban and suburban school districts. The estimated budget for this development plan (火炬計畫) is nearly 12 million US dollars, and the implementation is believed to affect more than 570,000 new immigrant mothers and their children (Ministry of Education, 2015).

Chen et al. (2008) also proposed policy recommendations of cultural pluralism and equal opportunity for the MOE: a). Realization of discrimination against new immigrant mothers, b). examination of the cultural hegemony in policy-making process, c). development of student’s sensitivity towards cultural pluralism in school, d.) provision of equal political opportunity.

**Statement of the Problem**

In addition to their educational, socioeconomic, cultural, and racial disadvantage, new immigrant mothers may face other immigration-related obstacles that affect their children’s academic achievement (Chen, 2011). Chen (2011) argued that immigration-related issues, particularly the lack of immigration status, cause this group of new immigrant mothers to be
perceived as “inferior” in Taiwan’s society. However, Kao et al. (2013) believed that this type of social bias and challenge, including the discrimination against mothers’ citizenship, only impacts children’s academic performance in early stage of education. As immigrants’ children grow, their parents’ immigration status becomes less impactful or no impact at all on children’s academic achievement in middle school or high school (Lin, 2009, Kao et al. 2003). Previous research studies also indicated the positive influence of parent’s immigrant status among voluntary immigrant minorities, including the power of community forces, positive identity and attitudes towards school. (Jin, 2001; Ogbu, 1991; Ogbu & Simons, 1998; Wu, 2009). Therefore, based on the current mixed research findings, this study sets out to look at both negative and positive impacts of parents’ immigration status on their children’s academic achievement in Taiwan.

Many researchers argued that there are both direct and indirect effects associated with parent’s immigration status: (1) Direct effect: parent’s gaining permanent residency or citizenship would enhance social immersion, and also improve their children’s educational attainment. (2) Indirect effects: regardless of their immigration status, new immigrant mothers may lack the knowledge, cultural familiarity, and social skills needed to assist their children’s academic success. Racial and ethnic disparities are also indirect effects for new immigrant mothers in Taiwan (Hsia, 2009; Kao et al., 2013; Lin 2009; Ogbu & Simons, 1998; Tsai & Huang; 2011). Therefore, this study also aims to examine both effects of mother’s immigrant status on middle-school students’ academic achievement, and to investigate if children of new immigrant mothers take advantage of being voluntary immigrant monitories, who are likely to outperform their peers of Taiwanese mothers (Ogbu & Simons, 1998).
In the US context, previous studies regarding the immigration policy in the United States showed a possible relationship between mother’s immigration status and children’s early education. Kao (2009) confirmed that mother’s immigration status impacts children’s academic performance in the beginning stage of children’s adjustment to the US education system, both directly and indirectly. In other Asian countries, the literature regarding the effect of mother’s immigration status on their children in South Korea indicated that the process of becoming Korean citizens for new immigrant mothers directly affects their children’s academic achievement (Lee, 2008; Kim, 2008). In Hong Kong, as most of new immigrant mothers come from mainland China, the barriers of language and obtaining citizenship are relatively lower. However, the prevalent discrimination against “mainland Chinese” still dominates Hong Kong’s society, and mother’s lack of social skills, familiarity, and knowledge, which are indirectly related to mother’s immigration status, affects the academic achievement of children of new Chinese immigrant mothers (Ng, 2009).

However, little research has been done to examine the hypothesis in Taiwan’s context—to what extent does a mother’s immigration status directly affect her children’s academic achievement in middles schools? Is mothers’ immigration status still a contributing factor to the academic achievement of their Taiwan-born middle school children? Do children of new immigrant mothers, who are considered as voluntary immigrants, have better chance to obtain high academic achievement in Taiwan’s education (Ogbu & Simons, 1998)? Or are there any other contributing factors, such as children’s language and cultural acquisition, interpersonal skills, or ability to adapt to school, that indirectly affect children’s academic achievement? As Taiwan begins to embrace more new immigrant mothers in recent year, impact of mother’s immigration status on their children’s academic achievement is yet to be examined.
Definition and Phenomena of new immigrant mothers and immigration status

The definition of new immigrant mothers in this study refers to those who were born in other countries or regions (mainland China included) outside of Taiwan, and those who immigrated to the country because of their marriages with Taiwanese citizens. According to the National Immigration Agency of Taiwan, in October 2016, the three largest groups of new immigrant mothers come from Mainland China (64.4%), Vietnam (18.5%), and Indonesia (5.6%). New immigrant mothers are considered the most fertile population that contributes to Taiwan’s stagnant fertility rate of 1.1%, one of the lowest around the world in 2016. As the result, many researchers predicted that this group of mothers and their children would become one of the most important groups in Taiwan’s educational and immigration policy reforms in the next decade (Chen et al., 2011; Lin, 2006; Wu, 2009).

Mother’s immigration status in this study is defined as having or not having Taiwanese citizenship, regardless mother’s country of origin. Taiwanese citizen mothers in this study consist of both native-born Taiwanese mothers (Natural Citizens) and new immigrant mothers who have lived in Taiwan long enough to obtain citizenship (Naturalized Citizens). Non-Taiwanese citizen mothers, on the other hand, are those who immigrated to Taiwan, but have not yet acquired permanent residency or citizenship. Previous research studies suggested using a broader term of “immigration status” instead of “citizenship” to present the difference between native-born citizens and naturalized immigrants, for there are always interactions between a immigrant’s citizenship, race, and ethnicity on children’s educational experience and attainment (Kao & Tienda, 1995; White & Glick, 2009). For one, children of certain racial or ethnic groups may experience negative or positive educational experiences that children of other groups may otherwise experience, regardless of their citizenship. Also, regardless of citizenship, certain
racial or ethnic groups may have educational or socioeconomic advantage than other racial or ethnic groups (Kao et al 2003, Kao & Tienda, 1995). Due to the limitation of available information in the selected dataset, mother’s immigration status in this study is then defined as a mother’s Taiwanese citizenship or permanent residency regardless of her race or ethnicity.

In Taiwan’s context, previous research suggested that though racial and socioeconomic disparities still remain between native-born Taiwanese mother and new immigrant mothers, new immigrant mother’s obtaining Taiwanese citizenship or permanent residency does enhance their working opportunity, social welfare, identity, and emersion in Taiwan’s society. And all these factors make naturalized new immigrant mothers share common threads with native-born Taiwanese mothers (Kao et al., 2013; Lin 2009; Tsai & Huang; 2011). Therefore, in this study, I combined both native-born Taiwanese mothers and new immigrant mothers, who have obtained Taiwanese citizenships, as one group; and new immigrant mothers who have not yet obtained Taiwanese citizenship or permanent residency as the other.

The phenomenon of Taiwan having a large number of new immigrant mothers is mainly related to the government’s economic policy and trend of globalization over decades. Tian et al (2006) argued that the evolution of Taiwan’s economic policy shapes its immigration trend from introducing female foreign labors to welcoming more new immigrant mothers in recent years. Since the 1980s, the needs of labor-intensive industry and individual household caregivers attracted numerous female foreign workers and household caregivers from mainland China and Southeast countries. In the 1990s and early 2000s, international matchmaking agencies also thrived to introduce foreign brides because of the demographic change among local Taiwanese women. Since the 2010s, thanks to the government’s Go South Policy and the trend of globalization, the number of new immigrant mother has been growing steadily in urban,
industrial-intensive and agricultural-intensive areas of Taiwan, particularly in Taipei, Taichung, and Kaohsiung (Ministry of Interior, 2017). According to the Ministry of Education (2017), as the majority of new immigrant mothers have low educational attainment (completion of middle school or lower), the majority of local Taiwanese men who marry new immigrant wives do have higher educational level (completion of high school or lower). The average age of new immigrant wives is 29-year-old and 25-year-old for mainland Chinese and Southeast Asian immigrants respectively (Ministry of Interior, 2017).

**Purpose of the Study and Research Questions**

As the number of low-educated new immigrant mothers grows rapidly, this study set out to investigate both negative and positive impact of mother’s immigration status, and also the extent of other identified factors related to mother’s low educational attainment on their children’s academic performance in middle schools in Taiwan (Lin, 2006). This study applies Huang and Tang’s (2007) conceptual framework that includes four main contributing factors to the academic achievement among the children of low-educated mothers. I added mother’s immigration status as the first-order variable in Huang and Tang’s (2007) four-factor model, and compared the effects of how five factors contribute to Taiwan middle students’ academic achievement:

There are two research focuses of the same regression model in this study:

1. To what extent, does low-educated mother’s immigration status affect their children academic achievement in Taiwan?
2. Also, in addition to mother’s immigration status, to what extent do other identified factors (i.e., children’s language proficiency, adaption to school, interpersonal skills and cultural acquisition) affect children’s academic achievement? Or if any of these
factors mitigates or aggravates effect of mother’s immigration status on their children’s academic achievement?

**Significance of the Study**

This study contributes to the current literature, which lacks pieces discussing the impact of mothers’ immigration status on children’s academic achievement in Taiwan. Previous studies have mainly focused on setting goals and strategies for educational equity for children of new immigrant mothers from educational and socioeconomic perspective (Yu, 2005; Zhou, 2004). However, these studies do not address this issue from the protocol of immigration-related policy and educational strategies.

Although Taiwan’s Ministry of Education in recent year has been working closely with local school leaders and practitioners to assure new immigrant mothers and their families’ active participation in children’s academic activities, MOE has not yet proposed any immigration-related recommendation for the Central Government to consider new approach of citizenship service or educational diversity for new immigration mothers and their children. Therefore, this study is to bridge the gap, and to provide a piece of empirical research by using a government-funded database Taiwan Educational Panel Survey (TEPS) conducted by Taiwan’s Academia Sinica, the highest level of research institute in Taiwan.

This study on mother’s immigration status also seeks to provide a valid perspective for current educational reforms which involve great deal of legislative process. In 2016, as more than thirteen percent of middle school students were born to mothers from Vietnam, Indonesia and mainland China, Taiwan begins to experience problems of what many immigration societies have tackled—immigration policy, identity, diversity in schools, and also other educational policy for children of new citizens. Huang and Tang (2007) predicted that children of new
immigrant mothers will reach to nearly twenty-five percent of student population in elementary and middle school in next ten years. As the result, Taiwan’s government also prioritizes a specific educational policy for children of new immigrant mothers in recent legislative reforms called Children of New Taiwan (新台灣之子). As the reform of Children of New Taiwan aims to involve both educational and legislative level of changes, this study provides a valid perspective of how mother’s immigration status may positively or negatively affects their children’s schooling and academic achievement.

In the scope of educational leadership, this study presents a possible reconsideration of current immigration-policy towards new immigrant mothers, and also provides a better understanding of immigration-related issues on educational reforms for both conservatives and liberal policy makers, and also proposes a piece of salient information for educational leaders and practitioners at both government and local school level. In addition, this study provides implications for middle school leaders and practitioners who often lack of knowledge in the field of immigration-related issues, to better support their students of new immigrant mothers, and to address needs of this population.

**Conceptual Framework**

To investigate the effects of mother’s immigration status on children’s academic achievement in Taiwan, I adapted Huang and Tang’s (2007) model of four contributing factors of low-educated mothers on their children’s academic achievement. Huang and Tang’s (2007) argued that mother’s education level affects four areas of her children’s academic achievement: language acquisition, adaption in school, interpersonal skills and cultural acquisition. As the majority of new immigrant mothers in Taiwan have low educational attainment (completion or
middle school or lower), Huang and Tang’s (2007) model provides a solid research framework for this study.

Based on Huang and Tang’s (2007) model, I added a variable of mother’s immigration status as the first-order variable in logistic regression to determine the impact of each variable on children’s academic achievement. Huang and Tang’s (2007) proposed that mother’s immigration status is another factor that is highly related to these four areas of impact, for a large number of low-educated mothers in Taiwan are new immigration mothers, who have not yet obtained Taiwanese permanent residency or citizenship. Figure 1 shows the conceptual framework in this study.

Huang and Tang’s (2007) model is based on a specific focus on low-educated mothers in Taiwan, and also is a mixed-method study of forty scholarly journals from 2003-2007, with first-hand interviews with children of low-educated mothers, including a large number new immigrant mothers. Their model framework is also one of few immigration-related models proposed by Taiwanese scholars, and is appropriate for investigation of Taiwan’s low-educated mothers and their children’s academic achievement.
Methodology, Design, Population and Sample

The purpose of this quantitative inferential study is to examine the impact of low-educated new immigrant mother’s immigration status, and other four contributing factors on middle school students’ academic achievement in Taiwan. Due to the nature of survey questions and assessment measurement being categorical, I utilize both binomial and multinomial logistic regression to determine the maximum likelihood estimation to evaluate the probability of impact of mother’s immigration status, children’s language acquisition, children’s interpersonal skills, children’s adaption in school, and children’s cultural acquisition, on their academic achievement. (Starkweather & Moske, 2011)

There are three phases of research design in this study: phase I—selection of Taiwan Educational Panel Survey (TEPS) questions; phase II—constriction, clustering, and coding of variables; phase III—results and analyses. TEPS is a the first national longitudinal database, tracking the same group of student from 2007-2014, with three survey sections for students, parents, school teachers/administrators, and a special TEPS assessment for each student participant. The survey questions for students include student’s self-assessment of language acquisition, adaption in school, interpersonal skill, and cultural acquisition, which are four variables in this study. These selected questions regarding student’s school life are also supplemented by reports from each student’s school teacher/administrator. As for mother’s immigration status, TEPS survey for students’ parents also contains valid information regarding mother’s immigration status. With selections of survey questions and participants being children of low-educated mothers, the sample size in this study is total of 807 middle-school student participants from the first wave of TEPS in 2007-2009.
In regard to the construction and coding of variables, I coded the focused variable of mother’s immigration status as dichotomous in 0 (non-Taiwanese permanent residents or citizens) and 1 (Taiwanese citizens), and other independent variables in four categorical memberships from 0 to 3. The dependent variable of student’s academic achievement is also coded from 0 to 3.

**Limitations**

This study is limited to a particular population of low-educated mothers and their middle school children in Taiwan. As previous research showed a greater impact of mother’s educational level on elementary school students (Kao, 2003; Wu, 2005; Zhen, 2012), the results of study are only applicable to middle school students. Moreover, due to the limited literature and lack of research on the impact of mother’s immigration status on their children’s academic achievement, there are only few questions regarding parents’ immigration status available in TEPS. In the same regard, due to the limited information available for mother’s immigration status, the group of Taiwanese citizen mothers in this study includes both native-born Taiwanese mothers, and possibly new immigrant mothers who have obtained Taiwanese citizenships. Cheng (2014) argued the prevalent stigma against new immigrant mothers and the sensitivity of immigration-related issues may drive TEPS survey participants to deliberately avoid self-report questions related to mother’s immigration status. Therefore, it requires much screening and a careful selection procedure to finally decide on mother’s immigration status as an inferential variable in this study.

Also, as the majority of the sample in this study contains new immigrant mothers from mainland China, the sample is subject to certain bias. Many previous research studies indicated that mainland Chinese immigrant mothers in Taiwan are different from Southeast Asian immigrant mothers, mainly because of their Chinese language ability and cultural backgrounds.
In term of the residency of the sample, the majority of new immigrant mothers in this study live in urban areas, which may also be a bias. Previous research indicated that new immigrant mothers living in urban areas of Taiwan enjoy more educational and social resources and incentives provided to them and their children than those who live in rural areas (Huang & Li, 2010). Therefore, this study is subject to certain bias because of the demographic distribution of the sample.

This study is also limited to the validity of TEPS’s measurement of students’ academic achievement. As many previous studies assessing middle school students’ academic achievement in Taiwan were based on the result of their High School Entrance Exams, this study uses TEPS’s own-designed of Comprehensive Analytical Ability Test (CATT) as outcome measurement. It is therefore subjected to the validity of TEPS measurement methods.

Also, the selection of conceptual framework is limited, as most of immigration-related models are proposed by the US or European scholars. Due to the little amount of literature available, I found it challenging to find a model that is specific for immigration-related issues in Taiwan. Haung and Tang’s (2007) model was a relatively well-established and comprehensive framework when addressing issues of low-educated mothers in Taiwan, but it still requires certain modifications in this study to include new immigrant mothers in their model.

**Summary**

The number of new immigrant mothers, those who come from mainland China, Vietnam, Indonesia, and Thailand, has been growing rapidly in Taiwan in the past decade. Previous studies found that the majority of new immigrant mothers have low educational attainment, and experience unprecedented social and economic pressure because of their lower educational level, race, and ethnicity (Chiu et al, 2008). Such pressure also affects the academic achievement of
their children in the early stage of education (Dong, 2003). Though Taiwanese government has been assisting these new immigrant mothers to adjust their new lives in Taiwan with various incentives and policies in both local and national level, the stigma against this group remains strong in the society.

However, many researchers also argued that new immigrant mothers as voluntary minorities in Taiwan’s society have positive influence on their children’s academic achievement (Ogbu & Simons, 1998; Tsai, 2004). For new immigrant mothers from mainland China, their familiarity in Chinese language and culture, and the positive identity and attitudes towards children’s schooling help their children to obtain better achievement. For Southeast Asian mothers, the influence of pan-Chinese culture of academic excellent also brings positive influence on their children’s academic achievement. Liu et al. (2009) also argued that children of new immigrant mothers have certain cultural and educational advantages that their peers of Taiwanese citizen mothers would not have, particularly those who live in urban areas, and those who have mainland Chinese immigrant mothers.

Thus, the purpose of this study is to look at the issue from both perspectives, and examine how mother’s immigration status, which is an indicator for better integration to Taiwan’s society, positively or negatively impact their children’s academic achievement (Wang & Chen, 2012). This study compares two groups of mothers: low-educated new immigrant mothers who have not yet acquired Taiwanese citizenships, and low-educated mothers who have Taiwanese citizenships. The research question in this study also aims to explore interaction effects between mother’s immigration and other contributing factors, including children’s language acquisition, children’s adaption to school, children’s interpersonal skill and cultural acquisition on children’s academic achievement.
This study is based on a well-established framework that is specifically designed for assessing issues related to low-educated mothers in Taiwan by local Taiwanese researchers (Huang & Tang 2007). It also contributes to the current literature regarding Taiwan’s new immigrant mothers, whose lack of immigration status is often overlooked in the current research, and has significance for Taiwan’s educational and political policy in the next decade. As the number of children of new immigrant mothers has increased steadily to almost twelve percent of the middle school population in the last decade, recent educational and legislative reforms in Taiwan have intentionally focused on this group of children. Therefore, understanding the issue of mother’s immigration status thus assists educators and school leaders and practitioners to better prepare appropriate and useful information for both students and parents, and also provide supportive and diverse environment for both local school and national levels.
CHAPTER 2
REVIEW OF LITERATURE

Over the past decade, the demographic composition of low-educated mothers in Taiwan has undergone a drastic change because of the increasing number of low-educated new immigrant mothers moving to Taiwan from Mainland China, Vietnam, and Indonesia. Therefore, the study of low-educated mothers and their children’s academic achievement in Taiwan has shifted focus from local Taiwanese mothers to include this group of new immigrant mothers in recent years (Huang & Tang, 2007, Wu, 2009; Yu, 2005).

New immigrant mothers share some similarities with low-educated Taiwanese mothers, such as prevalent low educational level, and also the influence of Confucianism in pan-Asian culture in their home countries. Pan-Chinese culture highly emphasizes the importance of children’s Chinese language proficiency, appropriate interpersonal ability, Chinese cultural acquisition, “being good” in school, and the most important of all—excellent academic achievement (Chen, 2010; Hsia, 2005). Many previous research studies indicated that these similar factors affect all children’s academic achievement, regardless of their mothers’ country of origin, and there is no significant difference in children’s achievement level (Chen et al., 2005; Hsia, 2005; Chen et. al, 2008). Chen and Yu (2005), on the other hand, also argued there are many differences between new immigrant mothers and Taiwanese citizen mothers, such as their Chinese language proficiency, adaption in society, social welfare, identity, working opportunity, and immigration status, which has not been much focused upon in current literature body.

To gain a better understanding of how mother’s immigration status and other low-educated-mother related factors affect the academic achievement of children of low-educated mothers in Taiwan, this chapter presents: a) a brief chronological description of the evolution of
“new immigrant mothers,” b) the literatures of the impact of mother’s immigration status on children’s academic achievement, c) global comparison of the impact of mother’s immigration status, d) introduction of Huang and Tang’s (2007) conceptual framework, and 5) the literature related to the relationships between children’s language acquisition, children’s adaption in school, children’s interpersonal skills, children’s cultural acquisition and their academic achievement.

The Evolution of Taiwan’s Immigration Policy for New Immigrant Mothers

To investigate Taiwan’s current immigration policy towards new immigrant mothers, I first examines chronologically of how Taiwan’s economic policy shapes its immigration trend from introducing female foreign labors to receiving more new immigrant mothers over decades.

Foreign labors. 1960s-1970s—the budding age of introducing female foreign labors to Taiwan. In the 1970s, the concept of “Wai ji xin niang” (foreign-born wives) was first introduced to Taiwan thanks to the increasing needs of labor-intensive industry that was dramatically shaping Taiwan’s economic boom in the 1960s-1970s. A small number of female foreign workers were introduced to Taiwan’s local factories at that time. Although these foreign female workers did not necessarily come to Taiwan as wives, as time passed, some of them entered into marriage with local Taiwanese men (Chang, 2003).

Also, Lin (2006) argued that in the 1970s, many of foreign-born wives were introduced to Taiwanese veterans who evacuated from Mainland China during the Chinese civil war in 1950s. Those veterans were forced to leave Mainland China without having any chances to bring their own families to Taiwan, and a large number of them remained single until the late age. In many cases, female foreign laborers were introduced to these veterans as home caregivers, and then became wives to these Chinese veterans (Lin, 2006). During this period, Taiwan’s government lacked any effective management for female foreign laborers, and the immigration law also
restricted the number of marriage-oriented visas to be issued. Therefore, cross-country marriage commissioners brought foreign-born wives as female foreign labors illegally to Taiwan, and many of them remained illegal before they were actually married to the local Taiwanese (Chang, Li & Kao, 2008).

Go-South Policy. 1970s-1980s was a forming age of introducing more foreign-born wives to Taiwan thanks to the Taiwan’s “Southward Policy” (“Go-South Policy”), one of the government’s leading economic policies implemented in Taiwan in the 1980s that encouraged small and middle-size business to invest in the Southeast Asia countries instead of moving West to the mainland China.

According to the record of Ministry of Economic Affairs, the implementation of Southward Policy motivated a large number of Taiwanese industries to invest in countries like Vietnam, Indonesia, Malaysia, Philippines, Thailand, Burma, and Cambodia (as the most popular countries) in the 1980s. At the same time, the policy brought Taiwanese businessmen to these countries, and began more intensive interactions with local Southeast Asian women. The matchmaking companies therefore emerged as a popular business for Taiwanese businessmen and Southeast Asian women since the 1980s. During this period, the Taiwan government began to slowly lift the restriction on marriage visas and to precede marriage-visa applications through the assistance of matchmaking companies. Xia (2004) argued that there were only somewhere between 40 to 283 immigrant spouses being naturalized in Taiwan before 1997.

Matchmaking Agency. 1990s—developing age of introducing more foreign-born wives through matchmaking companies: Taiwan’s economic boom and demographic changes in the 1990s promoted the business of matchmaking companies to introduce more foreign-born wives to Taiwan. In the 1990s, Taiwan was also going through a couple of dramatic industrial changes,
including the booming of domestic high-tech industry, the trend of moving labor-intensive industry out of country, and also the continuous needs for more foreign labors from Southeast Asia countries (Hsia, 2009; Wu, 2005).

Also, in the 1990s, the Taiwanese government started to focus on developing high-profit technology industry as a result of country’s educational reforms that produce a large number of hard-working talented technicians, including increasing number of female technicians (Chen & Yu, 2005; Ding, 2009). This trend reflected a higher educational and literate rate among female population. As Huang and Li (2012) argued that this demographic change promoted women’s self-identity and independence from men’s financial supports, and thus bolstered more local Taiwanese men to look for foreign-born wives introduced by matchmaking companies. The immigration policy for foreign-born wives in this period was highly related to the policy regulations imposed on matchmaking agencies. The marriage-visas were issued and granted through the assistance of matchmaking agencies as guarantors.

**New Immigrant Mothers.** In recent year, as the result of having more new immigrant mother in Taiwan, Taiwan’s Ministry of Education (Lin et.al 2015) proposed certain guidelines for local schools to provide more educational resources to new immigrant mothers and their children. These resources include: to build in learning “mother language” (including Vietnamese, Indonesia, Thai, Burmese, and Khmer) in the curriculum, to ensure an active and clear communication between local schools and new immigration mothers, and also to diversify resources and training programs for school leaders and practitioners to actively engage children of new immigration mothers and their families (Lin, 2005; Xia, 2010).

Also, the Bureau of Immigration now works closely with local governments to initiate incentive programs for new immigrant mothers and their children, including Chinese-learning
and cultural adaption programs, support networks/groups, citizenship services, and career counseling programs (Xia, 2009). For those who have been granted permanent residency, the working process of becoming Taiwanese citizens has also been made easier (National Immigration Agency). As discussed above, gaining Taiwanese permanent residency and citizenship enhances new immigrant mothers’ immersion and identity in Taiwan’s society, and also fosters more work opportunity and better social welfare for them (Kao et al., 2013; Lin 2009; Tsai & Huang; 2011). Therefore, becoming Taiwanese citizen makes new immigrant mothers share more common threads with native-born Taiwanese mothers that other foreign immigrant mothers do not otherwise.

Impact of Mother’s Immigration Status on Children’s Academic Achievement

Previous research studies showed mixed findings between parent’s immigration status and children’s educational outcomes, including a) the influence and interaction between parents’ race, ethnicity, and immigration status, b) foreign parents’ social welfare and working opportunity that are affected by their immigration status, c) the theory of immigrant paradox, which provides explanations of why children of immigrant parents outperforms their peer of native parents, d) Ogbu’s cultural-ecological theory of school performance also sheds light on why immigrant minorities have better academic achievement, e) global comparisons of the impact of mother’s immigration status on children’s academic achievement (Carter, 2003; Chen & Yu, 2005; Coleman, 1988; Hartman & Cornell, 2007; Haveman & Wolfe, 1995; Huang & Li, 2010; Kao, Vaquera, & Goyetee, 2013; Ogbu, 1991; Ogbu & Simons, 1998, White & Glick, 2009;).

The influence and interaction between parents’ race, ethnicity, and immigration status: Hartman and Cornell (2007) believed that the relationship between parents’ immigration
status and children’s educational outcomes are often overlapped with parents’ race and ethnicity. And the interactions between these factors often complicate the solo impact of mother’s immigrant status on children’s academic achievement. Many studies also suggested that the race and ethnicity complicate the relationships between parents’ immigration status and children’s educational outcomes, especially for certain racial or ethnic groups (Carter 2003; Lin, 2009; Jencks & Phillips 1998; White & Glick 2009). Kao et al. (2013) explained that the accounts of parents’ immigrant status, racial and ethnic disparities all impact educational outcomes. Specifically, the educational difference of minority and immigrant children reflects their parents’ class and socioeconomic status, and the immigration status of immigrant parents also reveals the difference in children’s educational outcome.

In Taiwan’s context, many researchers believed that following factors all mark the educational experiences and outcomes of children with new immigrant mothers: mother’s low socioeconomic status, low educational attainment, racial disparities and immigration status (Chen & Wu, 2009, Xia, 2008). Immigration status alone may negatively impact children’s academic achievement, but other factors should also been accounted for in Taiwan’s context. Therefore, this study takes mother’s immigration status and the factor of mother’s low educational attainment into accounts, and sets out to examine the relationship between children’s educational achievement, mother’s immigration status, and other identified factors related to mother’s low educational attainment (Kao, Vaquera, & Goyetee, 2013)

Foreign parents’ work opportunity and social welfares that are affected by their immigration status: Huang and Li (2010) argued that there are two crucial factors related to Taiwan’s immigration policy that affect children of new immigrant mothers: firstly, lack of permanent residency or citizenship jeopardizes new immigrant mothers’ work opportunity and
social welfare. New immigrant mothers’ work opportunities and social welfare are often negatively affected by their immigration status and disadvantaged socioeconomic backgrounds that would also bring negative influence on children, because of their lack of involvement in children’s academics (Huang & Li 2010). Prior to being able to work legally in Taiwan, most of new immigrant mothers have to work secretly in some small labor-intensive factories and are often working overtime, and this working pattern prevents them from spending quality time with their children and family, which may impact their children’s academic achievement (Chen & Wang 2010). Hsieh and Chuang (2010) argued that lack of new immigrant mother’s involvement in children’s schooling would affect their closeness, integration and adaption with local school and community, and also bring negative impact on their children’s sense of belonging in the community.

Secondly, the long process for new immigrant mothers to become Taiwanese citizenship indirectly affects children’s culture acquisition, interpersonal skills, language ability, identity, and adaption in school. New immigrant mothers are often “in a long process of becoming” Taiwanese, yet at the same time struggle with their own cultural and national identity (Chen & Yu, 2005) And as there are a couple of years’ gap between obtaining Taiwanese permanent residency or citizenship after immigrating to Taiwan, new immigrant mothers’ journey of becoming Taiwanese citizens may negatively affect children’s self-identity, adaption in school, and low self-esteem (Tsai & Huang, 2004). Also, because of the labor type and stigma against new immigrant mothers, Chen and Yu (2005) believed that the public view towards these mothers also indirectly impacts their children’s academic achievement. Their research finds that race and low socioeconomic status of new immigrant mothers have significant effects on
people’s attitudes towards their children, which leads to negative impact on their children’s academic achievement (Hagy & Staniec, 2002)

**The theory of immigration paradox:** contrary to the results of previous two points, the theory of immigration paradox, however, provides a different perspective of how parent’s immigration status positively affects children’s educational outcomes during adolescence from middle school to college (Kao, Vaquera, & Goyetee, 2013; Marks & Coll, 2012). Traditional assimilation theory suggests that as immigrants assimilate, their educational achievement and attainment should be higher (Gordon, 1964; Hirschman 1983; Kao, Vaquera, & Goyetee, 2013; Portes & Zhou 1993; Waters, 1990). However, recent studies found that some newcomer immigrant children in the US have higher level of attainment and achievement compared to their peers with native-born parents, despite of their own or parents’ linguistic and cultural barrier (Feliciano & Lanuza, 2017; Kao, Vaquera, & Goyetee, 2013). Kao and Turney (2010) confirmed that children of immigrant parents outperformed their same-race peers of native-born parents after adjusting for differences in their parental social and immigration status. For these children are more likely to believe themselves as more “native”, and face less discrimination thanks to their parents’ change in social and immigration status (Chang, 2002; Kao & Turney, 2010). Qian and Blair (1999) also believed the key to immigrant adolescents’ educational successes is high educational aspirations and expectations, particularly for the first and second-generation Chinese immigrants in many countries. In Taiwan’s context, Chang (2008) suggested that new immigrant mothers, who share strong pan-Chinese belief of hard-working to achieve higher social attainment and positively affect their children’s educational aspirations and expectations which ultimately impact children’s educational achievement and attainment (Chang, 2008).
Ogbu’s cultural-ecological theory of school performance—“community forces” for descendants of immigrant minorities (1998). Ogbu and Simons (1998) believed that the education of children of immigrant minorities were influenced by the community forces, in which voluntary minority communities and parents are strongly committed to their children’s academic succeeding in school with community’s ideas of hard work, better education, and role models (Ogbu & Simons, 1998). In Taiwan’s context, Lin et al. (2004) argued that new immigrant mothers choose to leave their home countries and immigrate to Taiwan because they see better opportunities for their children in Taiwan’s society. Cheng et al. (2007) believed this type of minority communities and parent’s strong commitment to children’s academic success contributes to higher academic achievement of children of new immigrant mothers, particularly in urban areas of Taiwan (i.e. Taipei, Taichung, and Kaohsiung city). Many previous case studies in Taiwan’s urban areas also indicated that new immigrant mothers have stronger commitment to children’s succeeding in school compared to those living in rural areas (Chen, 2009; Dong et al. 2011, Hsia, 2004). Therefore, given the fact that the majority of student sample in this study come from Taiwan’s urban school districts, it is likely that children of new immigrant mothers living in urban areas have better chance to outperform their peers of Taiwanese mothers because of stronger immigrant community forces.

In terms of immigrant minorities’ responses to the dominate culture and language around them, Ogbu and Simons (1998) believed that voluntary minorities overcome the culture and language barrier by learning the difference, and see it as additive that will enable them to succeed in the society (Ogbu & Simons, 1998). Huang (2011) argued that new immigrant mothers, particularly those from Southeast Asian countries, value highly of their children’s mandarin Chinese and Taiwanese language proficiency in addition to their acquiring mothers’
own languages. Previous studies also showed that the majority of children whose mothers come from Southeast Asian countries are able to speak mandarin Chinese or Taiwanese like their peers of Taiwanese mothers, and the language and cultural identity play no significant roles in their difference in academic achievement (Huang & Tang, 2007; Lin et al, 2010, Wu et al, 2004). For new immigrant mothers from mainland China, they may not experience much cultural and language barrier and discrimination in Taiwan’s society (Wen, 2009). As most new immigrant mainland Chinese mothers come from a society that shares the pan-Chinese cultural values and common language, their children also take advantage of learning Taiwanese mainstream ways and language rather quickly and better (Chen, 2004, Huang, 2008, Ogbu & Simons, 1998). Previous studies showed that particularly in urban areas of Taiwan, where a large number of new immigrant mainland Chinese mothers live, the likelihood of their children outperforming their peers of Taiwanese mothers increases because their better Chinese language acquisition ability and cultural identity with Taiwanese mainstream ways (Chiu, 2008; Deng, 2001; Hsia, 2009).

In terms of collective identity that contributes to better academic achievement of voluntary minorities, Ogbu and Simons (1998) argued that immigrant minorities share their parents’ and community’s positive identity towards host country that allow their descendants to succeed even under poor instruction (Ogbu & Simons, 1998). Ogbu and Simons argued that even when voluntary minorities are under poor instruction in schools, the community’s identity of “making it”, parents’ pragmatic attitudes towards schools, and high parental expectations, are all accounted for more important elements that contributes to their children’s high academic achievement. In Taiwan’s context, previous studies showed that community identity plays a significant role in new immigrant mothers’ pragmatic attitudes, high parental expectations, and identity towards schools in Taiwan, particularly for those who come from mainland China.
(Chang, 2005; Shi, 2009). Lin et al (2008) argued that because of the shared educational and cultural values between new mainland Chinese immigrant mothers and Taiwanese mothers, immigrant communities among mainland Chinese mothers are much strongly committed to children’s academic achievement, compared to communities of new immigrant mothers from Southeast Asian countries. Hsia et al. (2008) believed that role models, high standards, and active parental and community involvement are important factors contributing to children’s higher academic achievement among communities of new mainland Chinese immigrant mothers (Hsia et al, 2008). Therefore, as the the majority of student sample in this study are those who have new immigrant mother from mainland China, it is likely those children are able to outperform their peers of Taiwanese mother because of stronger community collective identity towards schools in Taiwan.

(5). Global Comparisons of the Impact of Mother’s Immigration Status on Children’s Academic Achievement: Cheng et al (2009) used the theory of socioeconomic status transfer to compare new immigrant parents and children between Taiwan and the US, and concluded that educational achievement and attainment differences that persist for children of minorities and new immigrants in the United States also occurs in Taiwan (Cheng et la, 2009; Coleman, 1988; Haveman &Wolfe 1995). The United States has been recognized as a country of diverse immigrants that has 51% of immigrants come from Latin America, 25% from South/East Asia, 12% from Europe, 8% from Africa/Middle East, and 2% from Canada (Pew Research Center 2015). Among these immigrants in the US, some groups enjoy natural advantage due to the selection of immigrants’ socioeconomic status, which often surpass the influence of their immigration status (Kao & et al. 2013) For example, in 2013, approximately 74.1% of new immigrant Asian adults (25-year and over) had at least completed a 4-year degree, and their
median household income is at $93,731 (Kao, Vaquera, & Goyetee, 2013). Thus, Kao et al. (2013) argued that for Asian immigrant parents, their lack of US permanent residency or citizenship do not bring negative impact on their children’s academic achievement at all because of prevalent higher socioeconomic status. In Taiwan’s context, as nearly 70% of new immigrant mothers have low educational attainment, most of them would not enjoy this type of socioeconomic advantage, and thus their immigrant status may play a more important role in their children’s academic achievement.

As for other Asian countries, Japan is commonly considered as the most economically developed country in East Asia, but also the most culturally and ethnically homogenous society (Nakamatsu, 2008). Due to its special historical background, Japan’s immigration policy is highly selective, and also has little acceptance of ethnic and cultural diversity, particularly for unskilled new immigrants (Ryo et al, 2015). However, as an ageing society, Japan in recent years turns the labor and economic solution to immigration (Nakamatsu, 2008). Recent immigration policy has been changing gradually because of low fertility rate and the lack of intensive labors in the country. Thus, in the pursuit of intensive labors, Shin (2012) argues that annual immigrant flow of 150,000 to Japan will improve the welfare of current and future generations, and will also alleviate the needs of labors. Previous research studies showed the positive impact of this immigration trend, and indicated new immigrant mothers’ contribution to Japan’s labor-intensive industries and low fertility rate (Kondo, 2015; Morris-Suzuki, 2015). However, more research is still needed to be done to examine the relationship between immigrant mothers and their children’s academic achievement in Japan’s context.

South Korea, on the other hand, welcomes more new immigrants than Japan mostly on temporary working visas and employment permit systems. Many researchers argued that this
trend of immigration policy makes a multi-ethnical Korea on horizon. (Kim, 2008; Wang et al., 2008; Watson, 2010). Similar to Taiwan’s rapid growth of foreign-born mothers, South Korea in recent years also experience the record high of new immigrant mothers from China, Vietnam, Indonesia, Thailand and the Philippines (Belanger, Lee & Wang, 2010). In a broader perspective, many previous research studies confirmed the positive influence of new immigrant labors on South Korea’s society, including its contribution to the shortage of labors, rapid ageing population, social and ethnical diversity (Kang 2010). However, in terms of multicultural education, research indicated that children of immigrant mothers still suffer discrimination and prevailing stigma in Korean society, and the predominant approach of assimilation to ethnic minorities remains problematic (Hong, 2010; Kim, 2014). Many researchers also argued that the long and complicated process of becoming Korean citizen and the prevalent lower socioeconomic status among new immigrant mothers may also indirectly affect various socio-economic and socio-cultural aspects of their children’s schooling and academic achievement (Oh, 2009; Yoon & Park, 2006). However, little research has been conducted to examine how voluntary immigrant minorities may be able to outperform their peers of native parents in Korea’s context.

Hong Kong as Special Administrative Region of China has a long history of importing foreign talents since the British occupation, and is currently accepting more mainland Chinese citizens for the need of active investment and labors (Hamilton, 2010). In 2016, Hong Kong has almost twenty percent (1.5 million) of its population mainland Chinese immigrants, and the number of those who were born to mainland Chinese in Hong Kong are also increasing (O’Neill, 2017). However, the prevalent stigma again mainland Chinese “new immigrants” remains strong mainly because of their language barrier, social and cultural identity rather than immigration
status (So, 2003). Previous research indicated that as there is little variation of race and ethnicity of new immigrants in Hong Kong, new immigrant’s language barrier in Cantonese and their social and cultural identity are considered as important factor contributing to their children’s schooling and academic achievement (Hung, 2009; Zhen, 2010). Therefore, immigration status is a less or no impactful factor for Chinese new immigrants and their children’s schooling in Hong Kong because of the shared political system between mainland China and Hong Kong (Kong, 2001).

Singapore is one of the most culturally and ethnically diverse country in Asia with more than one-third of total population consisted of immigrants (National Population and Talent Division, Singapore, 2015). In Singapore, the history of introducing foreign female workers to receiving more new immigrants brides is similar to Taiwan’s case, yet the scale of new immigrants coming into marriages with Singaporean men is much smaller than Taiwan (Lorente & Ng, 2005). In terms of multicultural education, the educational system in Singapore is highly diverse and emphasizes more on cultural immersion between different ethничal groups than assimilation (Ong, 2016; Tan, 2012). Therefore, previous research studies indicated that children of new immigration mothers in Singapore are more likely to be identified as children of “certain ethnic group” than children of “new immigrant mothers.” (Yeoh et al., 2000). As the results, many previous studies have more focused on examining children’s academic achievement by ethnicity or race rather than immigration status in Singapore’s context (Jones & Shen, 2008, Lam, Yeoh et. al, 2012).

In conclusion, current literature showed mixed findings regarding the relationship between mother’s immigration status and children’s educational achievement across countries. For one, mother’s immigration status, which is often overlapped with mother’s race,
socioeconomic status, class, and educational attainment, leads to children’s lower academic achievement. For another, previous research also indicated that mother’s immigration status is only crucial in the beginning of children’s education. After children of new immigrant mothers adjust for their parental social and immigration status, they are more likely to outperform their same-race native-born peers. Ogbu and Simons’ (1998) cultural-ecological theory of school performance and community forces also shed light on why children of voluntary immigrant minorities have better academic achievement than their native peers. In Taiwan’s context, researchers believed that parent’s socioeconomic, race, educational attainment, and immigration status all impact on children’s academic achievement. Specially, children of new immigrant mothers living in urban area of Taiwan enjoy more educational resources and incentives provided them, which may be a contributing factor to their better academic performance. Also, previous studies showed that having more mainland Chinese immigrant mothers in immigrant communities is a key factor to children’s higher academic achievement among voluntary immigrant monitories in Taiwan.

**Impact of four identified predictor variables on Children’s Academic Achievement**

**Impact of children’s language acquisition:** Phinney and colleagues (2001) argued that parent’s low educational attainment predicted adolescents’ poor language acquisition ability in general (Phinney, Romero, Nava & Huang, 2001). In Taiwan’s context, previous research also confirmed that most low-educated mothers, both native-born and new immigrants, have lower Chinese acquisition ability that also affects their children’s language acquisition ability. And the phenomenon occurs even more often for low-educated new immigrant mothers from Southeast Asia, compared to native-born or China-born low-educated mothers (Lin, Gu & Wu, 2005; Lai & Lin, 2009).
Regardless of mother’s immigration status, Lu (2005) and Su (2007) confirmed that mother’s language ability is only key to children’s language acquisition and immersion from age three to ten, and as children grow, the impact of student’s language acquisition on his or her academic achievement becomes less (Lu, 2005; Su, 2007). Samuelson and Smith (1998) suggested that language acquisition is more than simply learning a language, for it requires children’s sophisticated developmental and cognitive ability in early age that is highly related to mother’s educational and cultural background. Base on Smith’s (1998) theory, Wu (2004) also suggested that mother’s involvement in children’s schooling in much more important than her language ability for children’s overall academic achievement (Wu, 2004; Zhuang & Wang, 2004). Unfortunately, many research indicated that low-educated mothers in Taiwan has limited involvement in their children’s schooling and extracurricular activities due to the nature of their labor type and long working hours, and it thus negatively affects children’s language acquisition and overall academic achievement (Lin, 2009; Lu, 2004).

On the other hand, Shi (1999) believed that in Taiwan’s educational system, Chinese language ability is only one part of five major subjects in school, and is often “looked down” or “neglected”, compared to English, math, and science (Shi, 1999). It also showed in Chen and colleagues’ (2009) research that Chinese is considered as an insignificant subject among middle-school students, for they often have “false confidence” regarding their Chinese language ability (Chen, Lin & Chen 2011). Therefore, when assessing middle-school student’s academic achievement, language acquisition may be an important predictor, but there are still other elements involved.

In conclusion, previous research showed that children’s language acquisition ability is affected by mother’s low educational attainment, particularly in the early stage of their education.
In Taiwan’s context, previous research indicated that there is a relationship between children’s language acquisition and new immigration mother’s low educational attainment, cultural background and immigration status, yet the phenomenon occurs more often for younger children in kindergartens or elementary schools. This study sets out to examine how middle school students’ language acquisition affects and also mitigates or aggravates the impact of mother’s immigration status on their academic achievement in Taiwan.

**Impact of Children’s adaption in schools.** Many researchers argued that children of low-educated mothers in Taiwan are inclined to immerse themselves more slowly in the beginning of the learning process in schools because of their parent’s lower socioeconomic status and cultural background (Hsia, 2000; Huang, 2011). Moon and colleagues (2009) also suggested that parent education, acculturation, and the length of stay are three significant predictors for immigrant children’s school achievement (Moon, Kang & An, 2009). Li and colleagues (2008) confirmed that children’s of new immigrant mothers are more likely to experience adaption problems in school because of their mothers’ cultural difference and also the prevalent stigma against them (Li, Huang, Huang & Li, 2008). In the same regard, Huang and Tang (2007) believe the issue of “marginalization” for children of low-educated mothers does not only happen in school, but also in their adaption into the society, particularly for children of new immigrant mothers. Thus, mothers’ educational attainment, socioeconomic status, and cultural background are all important predictors for children’s adaption in school, and children of immigrant families are particularly at a disadvantage.

Jung and Zhang (2014), however, found that parents’ socioeconomic status, cultural background, or the stigma and marginalization against immigrant families, do not necessarily affect children’s adaption in school, but parental control and monitoring (Jung & Zhang, 2014).
Li and colleagues (2005) also confirmed that, in Taiwan, children of immigrant mothers are often raised in more authoritative and traditional families, and thus experience more challenges adapting in school, compared to children of local Taiwanese mothers. Therefore, when considering the impact of mother’s low educational attainment on her children, parenting style is also a crucial predictor.

In conclusion, previous research studies showed that mother’s low educational attainment affects children’s adaption in school because their lower socioeconomic status, class, and cultural inadequacy. However, the impact is greater only in the early stage of children’s education. In Taiwan’s context, research studies confirmed that both mother’s low educational attainment and immigration status affects children’s adaption in school and their academic achievement in early stage of education. This study is to investigate the relationship between middle school students’ academic achievement and their adaption in school, and also how their adaption in school mitigates or aggravated the impact of mother’s immigration status.

**Impact of Children’s interpersonal skills.** Based on the survey conducted by Education Ministry of Yun-Lin County in Huang and Tang’s (2007) study, middle-school students of low-educated and new immigrant mothers face more peer pressure and experience difficulty interacting with other peer because of their poor language acquisition in Chinese and poor adaption in school (Huang & Tang, 2007; Hong, 2009). Hong and Chen (2011), conducting similar survey in Kaohsiung and Pingtung County, also found that children’s of low-educated and new immigrant mothers are at higher rates of experiencing social challenges and discrimination in school (Chen & Hong, 2011). McClelland (2006) and colleagues confirmed that children’s learning-related social skills, including interpersonal skills and work-related skills, are significantly related to parent’s educational attainment and sociocultural background.
Their findings also suggest that children of low-educated parents are likely to score lower on academic outcomes, and have challenges transitioning in school (McClelland, Marrison & Holmes, 2006).

In certain context, however, many researchers argue the issue of interpersonal skills for children of low-educated and new immigrant mothers is not only related to family, but also highly associated with children own self-identity and self-concept (Guo, 2009; Tsai & Huang, 2004; Wu, 2004; Xiong, 2004). Chang (2006) also confirmed that for middle school students, self-identity and self-concept are more impactful for children’s interpersonal and social skills than parents’ socioeconomic status and cultural background (Chang, 2006). Many researchers also indicated that interpersonal skills and friendships in school are one of the critical contributing factors to middle school students’ academic achievement during their teen ages. Being able to be identified as “part of group” rather than good academic performance is an indicator for a “successful and happy school life” for Taiwan’s middle school students (Chu, 2004; Huang & Tang, 2011; Lin, 2009).

Therefore, when accessing how children’s interpersonal skills or friendships affect the academic achievement of middle-school students, parent’s educational attainment, children’s self-identity, self-concept, and emotional awareness should all be taken into careful consideration, particularly middle school students’ self-identify, self-confidence, and “being cool and accepted by peers” during their teen ages (Hong, 2007).

**Impact of Children’s culture acquisition.** Cultural acquisition is defined as the cultural learning or cultural transmission that allows individuals to acquire skills in people groups they would not otherwise be able to learn or acquire independently (Van Schaik & Burkart, 2011). Many researchers believe that cultural acquisition is a process of becoming and learning, in
which family, society and people groups are all key factors contributing to children’s cultural acquisition (Chen, 2010; Ke, 2004; Wu & Jin, 2011). In particular, previous research showed that this process of learning or becoming for children of low-educated mothers in Taiwan are often labeled as “inferior,” “secondary” and “different”. As the result, these children experience more challenges identifying themselves well in Taiwan’s cultural context (Chiu, 2009, Huang & Li 2010; Wen, 2006). Kahan and colleagues (2010) also predicted that children of low-educated parents or new immigrants are more likely to “overimitate” or copy instrumentally irrelevant actions under the pressure of dominant culture in their society, and thus results in inadequate or poor cultural acquisition that negatively affects their academic achievement (Kahan & Jenkins-Smith & Braman, 2010).

Wu (2009), however, argued that for children of low-educated or new immigrant mothers in Taiwan, there is no significant relationship between parents’ educational attainments, immigration status, children’s cultural acquisition, and academic achievement (Chen, 2011; Wu, 2009). Berry and colleagues (1986) also proposed three acculturation models: acculturation strategies, personal self-esteem, and collective self-esteem, in which personal self-esteem and collective self-esteem models are highly related to children’s better cultural integration and acquisition (Berry, Trimble & Olmedo, 1986; Giang & Wittig, 2006). Therefore, Wu (2009) et la concluded that, a) most children of new immigrant mothers integrate Taiwan and their mothers’ culture well and b) children’s cultural identification with their mothers’ cultures had a significant positive correlation with their cultural integration in Taiwan’s society (Kung, 2006; Wang & Wen, 2007; Wu, 2009).
**Theoretical Foundations**

This study measures two main constructs: impact of low-educated mother’s immigration status and four other identified factors (related to mother’s low educational attainment) on middle-school students’ academic achievement. The theoretical framework adapted in this study is Huang and Tang’s (2007) proposal of four main factors affecting children’s academic achievement of low-educated mothers in Taiwan. Huang and Tang (2007) suggested these four areas of impact as the result of mother’s low educational attainment: children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition. Based on their model, the I added one predictor variable of mother immigration status, and examined how mother’s immigration status and Huang and Tang’s (2007) proposal of four identified factor affect middle-school students’ academic achievement.

As shows in figure 2, Huang and Tang (2007) argued these four areas of impact are key predictors for children’s academic achievement, and are interrelated with each other. Their study is based on one of the most enduring findings in social science research regarding the transfer of parent’s socioeconomic status to their children (Huang and Tang, 2007). Their proposed model, particularly, focuses on the group of low-educated mothers (highest educational attainment of middle school or lower) in Taiwan, and is based on a longitudinal mix-method research from 2003 to 2007 for low-educated mothers (Huang and Tang, 2007).

The added variable of mother’s immigration status in this study is based on Huang and Tang’s (2007) hypothesis that a large number of their research groups are new immigrant mothers from Southeast Asian and mainland China. Therefore, it is likely that mother’s immigration status, to certain extent, is also related to the impact of low-educated mothers in Taiwan, for almost 74% of new immigrant mothers are considered low-educated (Huang &
Tang, 2007). Figure 2 indicates the relationship between Huang and Tang’s (2007) proposed predictors of children’s language acquisition, children’s adaption in school, children’s interpersonal skills, children’s cultural acquisition, and mother’s immigration status that are all considered as predictor variables in this study. Also, the current literature, including Chen (2013), Tsai (2000) and Xia (2012), indicates a strong relationship between children’s academic achievement and the impact low-educated mothers in Taiwan, utilizing Huang and Tang’s (2007) model.

**Figure 2**: Conceptual Framework based on Huang and Tang’s (2007)

**Characteristics and impact of mother’s low educational Attainment**

Mother’s Immigration Status

- Children’s language Acquisition
- Children’s adaption in school
- Children’s Interpersonal skills
- Children’s cultural acquisition

Children’s academic achievement

**Summary and Conclusion**

In this chapter, I first presented the evolution of Taiwan’s immigration policy from introducing foreign-born female labors in the 1990s to welcoming new immigrant mothers in recent years, and investigated the change of Taiwan’s economic, social and cultural environment over decades. This policy overview provided a panoramic picture of why issues regarding new immigrant mothers and their children’s academic achievement are becoming increasingly important in Taiwan’s educational system.
Current literature that shows mixed findings of the impact of mother’s immigration status on children’s academic achievement, including negative impacts of parent’s race, ethnicity, immigration status, socioeconomic status, working opportunity, and limited resources provided to children that all affect children’s academic achievement. However, literature regarding the theory of immigration paradox and voluntary immigrant minorities indicated certain positive impact of parents’ social and immigration status on children’s academic achievement. Also, the section of global comparisons of the impact of mother’s immigration status on children’s academic achievement presents how the U.S., Japan, South Korea, Hong Kong, and Singapore tackle the increasing needs of new immigrants and their children’s education that have changed the educational research framework in these countries.

In terms of the impact of four other identified factors related to mother’s low educational attainment on children’s academic achievement, the literature shows that mother’s low educational attainment negatively affects children’s language acquisition in early age, however, as children grow, it becomes less impactful. For children’s adaption school, the literature indicates parent’s educational attainment, socioeconomic status, cultural background, and parenting styles are all important predictors for children’s ability to adapt in school. Also, it shows in the literature that children’s interpersonal skills not only are related to mother’s educational attainment, but also to children’s own self-identity, self-concept, and emotional awareness, particularly among middle school students. In addition, the literature shows that mother’s low educational attainment and immigration status may be a factor contributing to children’s cultural acquisition, but mother’s different cultural background may also be a positive influence on children’s cultural acquisition and integration in Taiwan’s society.
In terms of conceptual framework, Huang and Tang (2007) demonstrated relationships between the impact of mother’s low educational attainment on their children’s academic achievement, including children’s language acquisition, children’s adaption in school, children’s interpersonal skills, children’s cultural acquisition, and also low-educated mother’s immigration status. The I added mother’s immigration status as the first-order variable in the model, and investigated to what extent mother’s immigration status affects children’s academic achievement, and also to what extents four identified factors proposed by Huang and Tang (2007) mitigate or aggravate the impact of mother immigration status on children’s academic achievement.
Chapter 3

METHODOLOGY

Research Design Overview

The main purpose of this study is to first examine to what extent the immigration status of low-educated new immigrant mothers plays a role in their middle-school children’s academic achievement, and also to investigate the effect of four other contributing factors of (related to the impact of low-educated mothers), including children’s language acquisition, adaption in school, interpersonal skills, and cultural acquisition, on their academic performance. In this section, I am presenting a) description of the instrument: survey question selections, b) coding mechanism, and c) methods of data analysis. This study is a retrospective repeated-measures observational study which utilizes a secondary dataset entitled Taiwan Educational Panel Survey (TEPS), a government-funded database conducted by Taiwan’s Academia Sinica, the highest level of research institute in Taiwan.

Due to the nature of both outcome variable and independent variables being categorical, I conducted logistic regression analysis to predict categorical placement in or the probability of category membership of independent variables on children’s academic achievement. The dependent variable of children’s academic achievement (AA) used in this study is the results of Comprehensive Analytical Ability Test (CAAT) of TEPS, which scales student’s academic achievement levels from 0 to 3: 0 (Poor), 1 (Average), 2 (Good), 3 (Excellent). The main subjects of CAAT were general analytical ability, science, mathematics, Mandarin Chinese, and English, and the test results are the combined scores of all subjects scaled into four categories. Chang (2014) argued the CAAT was developed to assess students’ overall “problem-solving”
ability rather than their “acquiring of knowledge”, and thus is target for students’ curriculum-free analytical ability.

Table 1 shows the frequencies, percentage, marginal percentage, mean, and standard deviation of each academic achievement level of children’s academic achievement. The average of children’s academic achievement was at 1.28 (SD=0.73), with four categories from 0 to 4. The marginal percentage listed is the proportion of valid cases processed in each of outcome variable’s group. Of the 726 subjects with valid data, 9.9% (n=72) students achieved TEPS’ index of excellent level, 16.5% (=120), 67.8% (n=492), and 5.8% (n=42) students were at good, average, and poor academic levels respectively.

Table 1. Descriptive statistics for dependent variable.

<table>
<thead>
<tr>
<th>Dependent Variable (n=803)</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
<th>Marginal* Percentage (%)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children Academic Achievement</td>
<td>Excellence (3)</td>
<td>72</td>
<td>9.0</td>
<td>9.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good (2)</td>
<td>130</td>
<td>16.2</td>
<td>16.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average (1)</td>
<td>515</td>
<td>64.1</td>
<td>67.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor (0)</td>
<td>58</td>
<td>7.2</td>
<td>5.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not applicable (999)</td>
<td>28</td>
<td>3.5</td>
<td>0</td>
<td>1.28</td>
<td>0.73</td>
</tr>
</tbody>
</table>

*Valid cases processed n=726

The five predictor variables in this study are: mother’s immigration status (IMM), children’s language acquisition (LA), children’s adaption in school (ADP), children’s interpersonal skills (INTER), and children’s cultural acquisition (CUL). Table 2 shows the frequencies, percentage, marginal percentage, mean, and standard deviation of each category for five independent variables. I coded each independent variable as: mother’s immigration status (IMM) as dichotomous in 0 (Non-Taiwanese citizens or non-Taiwanese permanent resident) and 1 (Taiwanese citizen or permanent residents); children’s language acquisition (LA) 0 to 3: 0 (Not fluent), 1 (Somewhat fluent), 2 (Fluent), 3 (Very fluent), and 999 (Not applicable); children’s
adaptation in school (ADP) 0 to 3: 0 (Not adapted), 1 (So-so), 2 (Feel adapted), 3 (Feel very happy and adapted), and 999 (Not applicable); children interpersonal skills (INTER) 0 to 3: 0 (Not good), 1 (So-so), 2 (Good), 3 (Great), and 999 (Not applicable); and children’s cultural acquisition (CUL) 0 to 3: 0 (Not good), 1 (So-so), 2 (Good), 3 (Great), and 999 (Not applicable).

The marginal percentage is also observed as how many valid cases are processed in SPSS for each independent variable’s group. It is confirmed in both Tables 1 and 2 that there are total of 77 missing cases in this study, and all missing data are eliminated from the analysis in SPSS.

This study then is to firstly focus on interpreting and comparing the function of mother’s immigration status, and secondly to examine the effect four other independent variables in an overall model-fitting information, likelihood ratio tests, and odds ratios against dependent variable to either support or disconfirm the extent to which mother’s immigration status and other four proposed variable affect children’s academic achievement.

Table 2. Descriptive statistics of independent variables (before clustering).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Immigration Status (IMM)</td>
<td>Citizens/Permanent residents (0)</td>
<td>371</td>
<td>46.2%</td>
<td>0.54</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>Non-citizens/ Non-Permanent residents (1)</td>
<td>432</td>
<td>53.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children Language Acquisition (LA)</td>
<td>Very fluent (3)</td>
<td>359</td>
<td>44.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluent (2)</td>
<td>326</td>
<td>40.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Somewhat fluent (1)</td>
<td>95</td>
<td>11.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not fluent (0)</td>
<td>11</td>
<td>1.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not applicable (99)</td>
<td>12</td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children's Ability to Adapt to School (ADP)</td>
<td>Feel very adapted and happy (3)</td>
<td>119</td>
<td>14.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feel adapted (2)</td>
<td>504</td>
<td>62.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>So-so (1)</td>
<td>135</td>
<td>16.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not adapted (0)</td>
<td>33</td>
<td>4.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Applicable (99)</td>
<td>12</td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children’s Interpersonal</td>
<td>Great (3)</td>
<td>271</td>
<td>33.7%</td>
<td>2.85</td>
<td>0.78</td>
</tr>
<tr>
<td></td>
<td>Good (2)</td>
<td>367</td>
<td>45.7%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As the center of this research is to estimate the k-1 log odds of each category, the estimate k-1 logistic regression is defined as:

(1). The likelihood of students obtaining excellent and good achievement rather than average and poor academic level, for a one-unit increase in an independent variable. I coded excellent and good achievement as 1, and average and poor as 0 in a binominal logistic regression. The results showed that the ordered log-odds of students being in high AA (y=High AA) may either increase (logit great than 0) or decrease (logit less than 0), if there is a one-unit increase in mother’s immigration status, children’s language acquisition, cultural adaption in school, children’s interpersonal skills, and children’s cultural acquisition.

(2). The likelihood of students being in higher academic achievement level (higher AA) for a one-unit increase in an independent variable, while holding all other independent variables constant. The results showed that the ordered log-odds of students being in Higher AA (y=Higher AA) may either increase (logit great than 0) or decrease (logit less than 0), if there is a one-unit increase in mother’s immigration status, children’s language acquisition, cultural adaption in school, children’s interpersonal skills, and children’s cultural acquisition.

(3). The likelihood of student being in excellent academic achievement level (Excellent AA) rather than other academic level, for a one-unit increase in an independent variable, while
holding all other independent variables constant. The results showed that the ordered log-odds of students being in excellent academic achievement (\(y=\text{Excellent AA}\)) rather in other academic achievement (\(y=1\)-Excellent AA) may either increase (logit greater than 0) or decrease (logit less than 0), if there is a one-unit increase in mother’s immigration status, children’s language acquisition, cultural adaption in school, children’s interpersonal skills, and children’s cultural acquisition.

**General Review of Database and Participants**

This study is a retrospective observational quantitative study based on the secondary database of Taiwan Education Panel Survey (TEPS), which is an eight-year (2007-2014) longitudinal database, tracking the same group of students from middle school to college. TEPS is considered the first collaborative research project sponsored and funded by both research institutes and government councils in Taiwan: Academia Sinica, Ministry of Education, and National Academy for Educational Research and National Science Council (Chang, 2006). In addition to the standardized scale of TEPS, Tam (2008) discussed five other distinguishing features of TEPS: (1) Theory driven (2) Student centered and multidimensional and multi-levels (3) Panel surveys covering multiple programs and multiple cohorts (4) National representative samples of the students, and (5) Public goods of data accessibility.

All TEPS survey questionnaires were self-report surveys, and were distributed to four sampling groups—students, parents, school teachers, and school administrators in three survey waves between 2007-2009, 2010-2012, and 2012-2014. During three survey waves, the same group of students progressed from middle school to high school, and then to colleges or universities. The specific questionnaires used in this study were the first wave survey during
2007 and 2009 when students were in middle school, and also several follow-up questions in 2010 regarding mother’s immigration status.

As for the outcome measures of students’ academic achievement, the TEPS research team developed a combination test of cognitive and non-cognitive ability, the Comprehensive Analytical Ability Test (CAAT), which includes the assessment of students’ behavior, mental health status, civic orientations, and value and attitudes (Tam, 2008). The main subjects of CAAT were general analytical ability, science, mathematics, Mandarin Chinese, and English, and the test results are scaled into four categories of excellent, good, average, and poor, which are the same outcome categories used in this study.

The sampling method utilized in this database is the stratified random sampling. In order to distinguish the “differences between schools” and the “different within schools”, TEPS researchers selected at least two schools in every school district (including both urban and rural areas defined by the Ministry of Education), and at least two classes in each school, and approximately 15-20 students were selected in each class. Also, certain schools were excluded in this survey: cram schools, schools not located in Taiwan island, and schools for physical-challenged students. The final sample size reported in 2014 survey was: 333 schools, 1,244 classes, 20,051 students, and 3,575 school teacher and administrators (Chang, 2014).

In term of the reliability statistics, Chang (2013) believed that TEPS had good evidence for reliability and validity. For example, the Cronbach’s α of TEPS were 0.78-0.83 for the first wave survey between 2007 and 2009. The Spearman’s correlation coefficient for the first wave survey was at .79. Since this study is based on the first wave survey of TEPS, both statistics of Cronbach’s α and Spearman’s correlation indicated good reliability and validity.

**Research Design—Participants and Instrument**
Participants—children of low-educated mothers

As defined, low-educated mothers in this study refer to those who finished their education up to middle school or lower, either in Taiwan or in their country of origins. According to Taiwan’s Ministry of Education, “low education level” is defined as “lower secondary education”, the standard of International Standard Classification of Education (ISCED) adopted by The United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2016 (Ministry of Education, 2016). Therefore, the definition of low education level as “middle school” is appropriate in this study for both local Taiwanese mothers and new immigrant mothers emigrating from other countries.

There are 13,703 valid cases that answered the survey question regarding mother’s educational level: “What is your highest level of education?” and those who completed middle school make 28.6% (n=3,920) of the survey pool. Out of the 3,920 valid cases of children of low-educated mothers, 803 participants were finally selected, as they match selection criteria for each variable in this study.

Instrument: Survey Questionnaire Selection for Dependent Variables

Academic Achievement

The academic achievement variable selected in this study is a special TEPS-designed assessment, Comprehensive Analytical Ability Test (CAAT), which is a combination of cognitive and non-cognitive ability tests in behavior, mental health status, civic orientations, value and attitudes, with academic subjects in analytical ability, science, mathematics, Chinese, and English. According to the user manual of TEPS, the academic achievement assessment is a weighed combined score of each area in non-cognitive ability test (referred as “curriculum-free
analytical ability subset”), general analytic ability, science, mathematics, Chinese, and English to assess each student’s overall academic performance (Cheng, 2014).

Researchers of TEPS base their questionnaires on the standard of Programme for International Student Assessment (PISA by OECD, Organization for Economic Cooperation and Development), which is characterized by the following principles: 1. The exam is aimed to assess student’s overall ability to solve exam questions, not simply the academic knowledge. 2. Exam questions are mainly designed in four areas of subjects: logics, science, math, and language ability. 3. For TEPS participants, TEPS researchers adjust different levels of questions based on students’ previous exam scores accordingly (Tam, 2008). The results of CAAT are categorized into scale of 0-3: 0 (Poor), 1 (Average performance), 2 (Good performance), 3 (Excellent performance), 999 (Not applicable), as show in Table 1.

**Instrument: Survey Questionnaire Selection for Independent Variables**

TEPS survey questions include three main sections for each participant: self-report of “about yourself” answered by students, self-report of “about my family” completed by student’s parents, self-report of “about this student” done by school teachers and administrator, and also a assessment of TEPS Comprehensive Analytical Ability Test (CAAT) reports. As Table 3 shows, the I selected the following survey questions for each independent variable to best answer two main research questions: a) To what extent the immigration status of new immigrant low-educated mothers plays a role in their children’s academic achievement, b) in addition to mother’s immigration status, to what extent children’s language proficiency, adaption to school, interpersonal skills and cultural acquisition also impacts their academic achievement.

Also, for questions regarding children’s language acquisition, children’s adaption in school, and children’s interpersonal skills, there are two questions selected: one for students to
answer, and the other one for teachers to confirm student’s answer. For example, when asked to rate “your fluency in Chinese”, student may choose from 0-3, but his/her answer must match teacher’s answer about him/her for verification.

**Table 3.** List of independent variables and selected survey questions.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Survey Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Where were you born?</em></td>
</tr>
<tr>
<td></td>
<td>(Taiwan, Mainland China, Other countries—please specify)</td>
</tr>
<tr>
<td>Mother’s Immigration status (IMM)</td>
<td>“If not born in Taiwan, how long have you been living in Taiwan? When did you register as member in Taiwanese household?”</td>
</tr>
<tr>
<td></td>
<td>(More than 10 years, 5-10 years, Less than 5 years.)</td>
</tr>
<tr>
<td></td>
<td>“Where does your father come from?”</td>
</tr>
<tr>
<td></td>
<td>(Taiwan, Mainland China, or specify others)</td>
</tr>
<tr>
<td></td>
<td>“Fluency in Taiwanese”</td>
</tr>
<tr>
<td></td>
<td>(Very fluent, Fluent, Somewhat fluent, Not fluent, Not applicable)</td>
</tr>
<tr>
<td></td>
<td>“Fluency in Hakka”</td>
</tr>
<tr>
<td></td>
<td>(Very fluent, Fluent, Somewhat fluent, Not fluent, Not applicable)</td>
</tr>
<tr>
<td></td>
<td>“Fluency in any Taiwanese aboriginal language”</td>
</tr>
<tr>
<td></td>
<td>(Very fluent, Fluent, Somewhat fluent, Not fluent, Not applicable)</td>
</tr>
<tr>
<td>Children’s Language Acquisition (LA)</td>
<td>“For student: your fluency in Chinese”</td>
</tr>
<tr>
<td></td>
<td>(Very fluent, Fluent, Somewhat fluent, Not fluent, Not applicable)</td>
</tr>
<tr>
<td></td>
<td>“For teacher: how is this student’s Chinese fluency?”</td>
</tr>
<tr>
<td></td>
<td>(Very fluent, Fluent, Somewhat fluent, Not fluent, Not applicable)</td>
</tr>
</tbody>
</table>
Children’s Adaption in school (ADP)

“For student: your adaption in school”
(Feel very adapted and happy, Feel adapted, So-so, Not adapted, Not applicable)

“For teacher: How is this student’s adaption in School?”
(Feel very adapted and happy, Feel adapted, So-so, Not adapted, Not applicable)

Children Interpersonal Skills (INTER)

“For student: you friendships in school”
(Great, Good, So-so, Not good, Not applicable)

“For teachers: How well is this student’s interpersonal relationship/friendships in school?”
(Great, Good, So-so, Not good, Not applicable)

Children’s Cultural Acquisition (CUL)

“Traditional Chinese value of education taught at home”
(Very much emphasized, Emphasized, Somewhat emphasized, Not emphasized, Not applicable)

Mother’s Immigration Status

Mother’s immigration status is a binary variable that was categorized as permanent resident/citizen (CI/PR) and non-permanent resident/citizen (Non-CI/PR) in this study. As discussed above, though there is no direct survey question asking for mother’s immigration status, a follow-up question distributed in 2010, “If not born in Taiwan, how long have you been living in Taiwan?/ When did you registered as member in Taiwanese household?” was intended to serve as a purpose of asking, “Have you lived in Taiwan long enough to acquire permanent residency or Taiwanese citizenship?” The process of becoming Taiwanese citizens begin with new immigrant’s registration as a legal member of Taiwanese household, and after five years, he
or she will be eligible for acquiring permanent residency in Taiwan. And after 3 years of being a Taiwanese permanent resident, a new immigrant mothers is qualified for citizenship. Chen (2011) argued that because of Taiwan’s immigration policy, in most cases, the sixth year marks an important threshold of citizenship process for new immigrant mothers. Thus, only those who live in in Taiwan or register as a legal household member less than 5 years are selected to fit the first criteria of being “non-permanent residents (non-PR) or non-citizens (non-CI)”.

To make sure mother’s immigration status is carefully determined, I added two other criteria for non-PR and non-CI mothers: whose fathers came from Mainland China or other specified countries, and those who are not fluent in any of Taiwanese, Hakka, or Taiwanese aboriginal languages. For instance, if a mother who lives in Taiwan less than five years reports that her father came from mainland China or other specified countries, and is not fluent in any of Chinese or Taiwanese languages, she is selected as non-PR or non-CI in this study.

Deng (2000) confirmed that after two decades of “Promotion of Mother Language” (台灣母語教育) campaign in Taiwan, and also the nature of immigration-based marriage being Taiwanese-husband dominated, new immigrant mothers who live in Taiwan more than three years are expected to be “fluent” or “somewhat fluent” in any neighborhood languages they live in. Lin (2009) also argued that new immigrant mothers from mainland China are likely to acquire any of Taiwanese language, Taiwanese specifically, in a shorter period of time after immigrating to Taiwan, given the advantage of their fluency in Mandarin. Therefore, these three criteria of determining mother’s immigration status are considered accurate and sufficient in this study.

Simply put, only those who meet the following selection criteria are considered as low-educated non-PR or non-CI mothers:

1. Whose highest degree’s completion was middle school or lower.
2. Who was not born in Taiwan.
3. If not born in Taiwan, who lived in Taiwan, or registered as a legal Taiwanese household member less than five years.
4. And whose fathers came from Mainland China or any other specified countries.
5. And who is not somewhat fluent or fluent in any of Taiwanese language, including Taiwanese, Hakka, or Taiwanese aboriginal languages.

Demographic Information of the Sample

Table 4, 5 and 6 show the numbers of Taiwanese citizen mothers, new immigrant mothers’ countries of origin, and children’s school district distribution in this study. Table 4 shows that there are 53.8% (n=432) Taiwanese citizen mothers, 24.5% (n=197) mainland Chinese mothers, 12.3% (n=99) Vietnamese mothers, 4.9% (n=40) Indonesia mothers, 3.6% (n=29) Thai mothers, and 0.8% (n=6) other nationals. Table 5 shows that 78.2% (n=628) of children and their families in this study live in urban areas of Taiwan, while 21.3% (n=171) reside in rural areas.

Table 4: Number of low-educated mothers

<table>
<thead>
<tr>
<th>Country of Origin</th>
<th>Number (n=803)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taiwanese CI/PR</td>
<td>432</td>
<td>53.8%</td>
</tr>
<tr>
<td>Mainland China</td>
<td>197</td>
<td>24.5%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>99</td>
<td>12.3%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>40</td>
<td>4.9%</td>
</tr>
<tr>
<td>Thailand</td>
<td>29</td>
<td>3.6%</td>
</tr>
<tr>
<td>Others</td>
<td>6</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

Table 5. School Districts of all children.

<table>
<thead>
<tr>
<th>School District</th>
<th>Number (n=803)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>628</td>
<td>78.2%</td>
</tr>
<tr>
<td>Rural</td>
<td>171</td>
<td>21.3%</td>
</tr>
</tbody>
</table>
These tables provide important demographic information for this study: a) the majority of new immigrant mothers come from mainland China, b) the majority of new immigrant mothers and their children live in urban areas of Taiwan.

Previous studies showed that thanks to the pan-Chinese culture of positive attitude, shared educational values, and collective identity towards children’s academic performance, children who have new immigrant mother from mainland China have better chance to outperform their peers of Taiwanese citizen mothers. Such trend also occurs in immigrant communities where a large number of new mainland Chinese immigrant mothers are part of (Chiu, 2008; Deng, 2000; Hsia, 2009, Ogbo & Simons, 1998). Also, previous research showed that children of new immigrant mothers living in urban areas of Taiwan enjoy certain educational resources and incentives provided to them that their peers of Taiwanese citizen mother would otherwise take advantage of (Chen, 2009, Chiu et al, 2008; Hsia, 2009). Therefore, the demographic distribution of the sample in this study should be taken into careful consideration when analyzing and presenting the final results.

Children’s Language acquisition

There are two selection criteria for children’s language acquisition—student’s self-report and teacher’s report regarding student’s language fluency. The most significant survey question regarding children’s language acquisition is a self-report question, “Your fluency in Chinese” with scale 0 to 3: 0 (Not fluent), 1 (Somewhat fluent), 2 (Fluent), 3 (Very fluent), and 999 (Not applicable). Student’s answer to this question is also confirmed by teacher’s reports “How is this student’s Chinese fluency?” with same scale of 0-3: 0 (Not fluent), 1 (Somewhat fluent), 2 (Fluent), 3 (Very fluent), and 999 (Not applicable). For example, if a student’s self-report of

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
<td>4</td>
<td>0.5%</td>
</tr>
</tbody>
</table>
his/her Chinese fluency as 3 (very fluent), but his/her teacher marks 2, 1, 0, or no answer (999), this student is not selected as a valid case.

TEPS researchers believed that language proficiency is an impactful factor for students’ academic performance in pre-k and elementary schools or in Taiwan (Chen, Gui & Wu; Wu, 2009). However, the impact of language proficiency on children’s academic achievement of new immigrant mothers in middle school is still to be examined. Chen et al (2011) also argued that mothers’ low proficiency in Chinese considerably affects their children’s language acquisition in early stage of their school, which often results in poor academic performance, low self-esteem, and incompetent interpersonal skills and relationships.

Children’s adaption in school

As for children adaption in school, there are also two survey questions selected in this study: student’s self-assessment of “You adaption in school?” and teacher’s report of “How is this student’s adaption in school?” with scale of 0 to 3: 0 (Not adapted), 1 (So-so), 2 (Feel adapted), 3 (Feel very happy and adapted), and 999 (Not applicable). Only those students whose self-assessment answers match their teachers’ reports are selected.

TEPS researchers argued that middle-school student’s adaption in school is a important factor contributing to his/her academic achievement in Taiwan, for it indicates how well a student’s intellectual and emotional adjustment is under the growing academic pressure from the Joint High School Entrance Exam, and other peer pressure during their teen years (Huang & Wu, 2000). Xia (2013) also confirmed that children of low-educated mother are particularly venerable, as most of their mothers did not experience such academic pressures.

Children’s interpersonal skills
In terms of children’s interpersonal skills and relationships, the I also selected two most representable questions in TEPS surveys: student’s self-report question of “Friendships/Interpersonal relationships in school” and teacher’s assessment “How well is this student’s interpersonal relationship in school?” with scales 0 to 3: 0 (Not good), 1 (So-so), 2 (Good), 3 (Great), and 999 (Not applicable). Students’ answers to this question are also validated by their teachers as to be selected as valid cases in this study.

Taiwan’s Ministry of Education in 2016 lists several important goals of improving interpersonal ability and having meaningful engagement in school for children of new immigrant mothers (Wang & Chen, 2013). TEPS researchers also believed that middle school students’ interpersonal skills and friendships are significant factors contributing to their academic achievement in their teen years. Lin (2009) believed that children of new immigrant mothers in Taiwan face more social challenges in school because of their parents’ relatively low socioeconomic status and poor language ability. Thus, children’s interpersonal ability is considered as an imperative variable when accessing children’s academic achievement of low-educated new immigrant mothers.

**Children’s Cultural Acquisition**

A self-report question of “Traditional Chinese value of education taught at home” with scales 0 to 3 is selected to assess children’s cultural acquisition at home: 0 (Not good), 1 (So-so), 2 (Good), 3 (Great), and 999 (Not applicable). This question is imperative not only because Chinese tradition of academic excellence may affect children’s academic performance, but also because it reveals the extent of new immigrant mothers’ own culture may influence their children.
Chen et al (2011) argued that children’s cultural acquisition is mostly acquired through family education, where new immigrant mothers are also involved in bringing their own cultures to the family. Therefore, traditional pan-Chinese culture that heavily emphasizes the importance of children’s academic excellence may be influenced by their parents’ different cultural backgrounds. TEPS researchers believed that new immigrant mother’s social class and ethnicity are intimately connected with their living experiences in Taiwan that may affect their expectation for children’s academic achievement, particularly for those who come from Southeast Asia.

**Data Analyses**

**Data Screening and Clustering Procedure**

Data were downloaded to SPSS 24.0 from the online version of Taiwan Educational Panel Survey (TEPS) from Survey Research Data Archive (SRDA) of Taiwan’s Academia Sinica website. TEPS is a longitudinal study containing three survey waves from 2007-2014, and the focused group (middle-school students) in this study was being surveyed during the first survey wave between 2007-2009. Also, in order to obtain the follow-up questions regarding mother’s immigration status, the datasets of second wave during 2010-2012 were also downloaded.

First, I applied the selection criteria of low-educated mothers—with the highest degree completion of middle school regardless of mother’s country of origin. After the selection, 3,920 out of 13,702 mothers completed their highest degree of middle school or lower. Among this pool of participants, I continued to select the main independent variable of “mother’s immigration status”—509 out of 3,920 were new immigrant mothers without Taiwanese permanent residency or citizenship. 1,670 out of 3,920 were mothers with Taiwanese permanent residency or citizenship. Finally, I applied selection criteria for each independent variable, and
finally decided on 432 mothers with Taiwanese permanent residency or citizenship and 371 mothers without Taiwanese permanent residency or citizenship.

Secondly, I coded each independent variable according to the categories of selected survey questions. Thirdly, I obtained a frequencies table for each category of every variable, and clustered the category that is less than five percent with the previous category. Cohen and his colleagues (2003) recommended discarding or clustering any variable category that is less than five percent in logistic regression. For example, as there are only 11 valid cases (1.49%) of “Not fluent” in children’s language acquisition, the category of “Not fluent” is then combined with cases of “Somewhat fluent”.

Table 6 shows the final coding, frequencies, percentage, marginal percentage, mean, and standard deviation for each clustered independent variables: mother’s immigration status coding remain as dichotomous 1 (Non-Taiwanese citizen or non-Taiwanese permanent), 0 (Taiwanese citizens or permanent resident); children’s language acquisition 0 to 2: 0 (somewhat poor/poor), 1 (Good), 2 (Great), 999 (not applicable), children’s adaption in school 0 to 2: 0 (somewhat poor/poor), 1 (Good), 2 (Great), 999 (Not applicable); children’s interpersonal skills: 0 (somewhat poor/poor), 1 (Good), 2 (Great), 999 (Not applicable); children’s cultural acquisition: 0 (somewhat poor/poor), 1 (Good), 2 (Great), 999 (Not applicable). Finally, I treated 999 (Not applicable) as data missing completely at random (MCAR), and eliminated them from the analyses.

Table 6. Descriptive statistics for clustered independent variables (clustered variables)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
<th>Marginal* Percentage (%)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Immigration Status (IMM)</td>
<td>Citizens/Permanent residents (0)</td>
<td>371</td>
<td>46.2%</td>
<td>40.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-Citizens/Non-</td>
<td>432</td>
<td>53.8%</td>
<td>59.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Permanent residents (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.54</td>
<td>0.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Children Language</strong></td>
<td>Great (2)</td>
<td>359</td>
<td>44.7%</td>
<td>49.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good (1)</td>
<td>326</td>
<td>40.6%</td>
<td>44.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acquisition (LA)</strong></td>
<td>Somewhat poor/poor (0)</td>
<td>106</td>
<td>13.2%</td>
<td>5.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not applicable (99)</td>
<td>12</td>
<td>1.5%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Children’s Ability to School (ADP)</strong></td>
<td>Great (2)</td>
<td>119</td>
<td>14.8%</td>
<td>14.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good (1)</td>
<td>504</td>
<td>62.8%</td>
<td>69.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Adapt to School (ADP)</strong></td>
<td>Somewhat poor/poor (0)</td>
<td>168</td>
<td>20.9%</td>
<td>15.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Applicable (99)</td>
<td>12</td>
<td>1.5%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Children’s Interpersonal Skills (INTER)</strong></td>
<td>Great (2)</td>
<td>271</td>
<td>33.7%</td>
<td>37.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good (1)</td>
<td>367</td>
<td>45.7%</td>
<td>45.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cultural Acquisition (ADP)</strong></td>
<td>Somewhat poor/poor (0)</td>
<td>163</td>
<td>20.3%</td>
<td>17.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not applicable (99)</td>
<td>2</td>
<td>0.3%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.13</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Children’s Cultural Acquisition (ADP)</strong></td>
<td>Great (2)</td>
<td>159</td>
<td>19.8%</td>
<td>21.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good (1)</td>
<td>361</td>
<td>45.0%</td>
<td>49.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Somewhat poor/poor (0)</td>
<td>206</td>
<td>25.7%</td>
<td>28.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not applicable (99)</td>
<td>77</td>
<td>9.6%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.94</td>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Valid cases processed n=726

**Main Analysis**

After data were screened and coded, the main analyses conducted in this research were: the descriptive statistics for all variables, bivariate analyses, and logistic regressions. Bivariate analyses included the correlation matrix between independent variables, and also the tolerance and variance inflation between each predictor variable and outcome variable in variance and VIF statistics (Appendix A). Cohen (2003) recommended investigating the tolerance and variance inflation statistics generated for each variable used in the regression, and finding them to be within acceptable parameters (i.e. tolerance greater than .20; VIF less than 4.0), when a significant interaction was found between variables. Aiken and West (1991) also suggested exploring meaning of interactions with a fair degree of relationship. The last section included the ordinal logistic regression estimating the likelihood of students achieving high (excellent and
good) and higher level, for a one-unit increase in independent variable. Also, the logistic regression estimating the likelihood of students being in excellent academic achievement rather than other achievement levels is conducted in order to examine what factors contributing to student’s excellent academic achievement. The stepwise logic regression model also reveals the possible interactive effects of which the student variables mitigate the effect of mother’s status. The results and analyses are presented in the following chapter.
This chapter presents the results of bivariate analyses, and the findings of two main research focuses in this study: (1) To what extent the mother’s immigration status affects middle-school children’s academic achievement. (2) To what extent that other factors, include children’s language acquisition, children’s adaption in school, children’s interpersonal skills/friendship, and children’s cultural acquisition, affect middle school students’ academic achievement. And how any of these factors mitigate or aggravate effect of mother’s immigration status on their children’s academic achievement.

The first question is aimed at identifying the maximum likelihood estimation to evaluate the probability of children of non-Taiwanese citizen/permanent resident (non-CI/PR) mothers to achieve higher academic levels. To answer this question, I conducted stepwise logistic regressions and analyzed the likelihood estimation of probability for children of non-Taiwanese CI/PR mothers to achieve higher academic levels, compared to children of Taiwanese citizen/permanent resident CI/PR mothers.

The second research focus is to identify how children’s language acquisition (LA), children’s adaption in school (ADP), children’s interpersonal skills (INTER), and children’s cultural acquisition (CUL) may also affect, mitigate, or aggravate any effect of mother’s immigration status on their children’s academic achievement. I also performed the same ordinal logistic regression to examine the estimated likelihood of students obtaining higher academic achievement, for a one-unit increase in their language acquisition ability, ability to adapt school, interpersonal skills, and cultural acquisition ability.
Also, in order to examine the factors contributing to students’ obtaining excellent academic achievement rather than other achievement levels, the I conducted another logistic regression to investigate the likelihood of students obtaining excellent academic level rather than other achievement levels for a one-unit increase in their language acquisition ability, ability to adapt school, interpersonal skills, and cultural acquisition ability.

Bivariate Analysis

Table 7 shows the correlation matrix of all variables in this study, including both predictor and outcome variables. The results indicate strong correlations (i.e., Spear’s correlation coefficient greater than the absolute value of .15) between the outcome variable of children’s academic achievement and mother’s immigration (.24, p< .01), children’s language acquisition (.23, p< .01), children’s adaption in school (.41, p< .01), children’s interpersonal skills (.48, p< .01), children’s cultural acquisition (.56, p< .01). Fink (1995) suggested that the absolute value of a correlation between .26 and .50 is considered as moderate to good relationships in social science.

**Table 7.** Correlation matrix between predictor and outcome variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Immigration Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.52**</td>
</tr>
<tr>
<td>2. Language Acquisition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.42**</td>
<td>.41*</td>
</tr>
<tr>
<td>3. Adaption in School</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.39**</td>
<td>.39**</td>
</tr>
<tr>
<td>4. Interpersonal Skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.63**</td>
<td>.60*</td>
</tr>
<tr>
<td>5. Cultural Acquisition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.48**</td>
<td>.56**</td>
</tr>
<tr>
<td>6. Children’s Academic Achievement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* * Correlation is significant at .05 level. ** = Correlation is significant at the .01 level.

The collinearity statistics of tolerance and variance inflation factor (VIP) between each independent variable and the outcome variable is also tested. Cohen (2003) and his colleagues recommend examining the collinearity statistics within acceptable parameter, which is tolerance.
greater than .20, or VIF less than 4. Appendix A shows the collinearity statistics of each independent variable on children’s academic achievement. The results show no collinearity concerns in this study.

**The Results of Logistic Regression Analysis**

The first research focus in this study is to what extent the mother’s immigration status affects their middle-school children’s academic achievement in Taiwan. The second research focus is to examine what may also be other contributing factors (all related to mother’s low educational level), including children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition, to the academic achievement of children of low-educated mothers in Taiwan. Logistic regression is an appropriate approach because the variables of interests are all categorical in this study: children’s academic achievement, mother’s immigration status, children’s language acquisition, children’s adaption in school, children’s interpersonal skills and children’s cultural acquisition. And these variables are under the assumption of nature ordering.

**Binomial Regression for Student Obtaining Higher Academic Achievement**

I first used the stepwise binomial logistic regression model to predict the likelihood of students obtaining high academic achievement level rather than low academic achievement, for a one-unit increase in predictor variables. Specifically, I coded those who are in excellent and good achievement as 1—high academic achievement; and those who are in average and poor achievement levels as 0—low academic achievement. The following table shows the logistic regression coefficients, which represents the expected change in log odds of student obtaining high academic achievement (1=excellent and good achievement levels), for a one-unit increase in
mother’s immigration status, children’s language acquisition, children’s school adaption, children’s interpersonal skills and children’s cultural acquisition.

The results of Table 8 show how a one-unit increase in each independent variable improves or decreases the likelihood of students obtaining the high achievement category (1). It indicates that mother’s immigration status (1: Non-Taiwanese CI/PR mothers; 0: Taiwanese CI/PR mothers) is statistically significant (p=.03) in the model. According to its regression coefficient (B=.56, Exp. (B)= 1.51), it is 51% more likely that children who have non-Taiwanese CI/PR mothers to obtain high academic achievement compared to children who have Taiwanese CI/PR mothers. Specifically, for one-unit increase in mother’s immigration status (from Taiwanese CI/PR to non-Taiwanese CI/PR), the ordered log-odds of children who have non-Taiwanese mothers to obtain higher academic achievement would be expected to increases by .56 unit, while holding children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition constant.

Table 8 Regression coefficient and odds ratio for factor associated with student’s obtaining high academic achievement level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Sig. (p)</th>
<th>Exp. (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Immigration Status</td>
<td>.56</td>
<td>.25</td>
<td>.03*</td>
<td>1.51</td>
</tr>
<tr>
<td>Children’s Language Acquisition</td>
<td>.06</td>
<td>.21</td>
<td>.76</td>
<td>1.07</td>
</tr>
<tr>
<td>Children’s Adaption in School</td>
<td>.73</td>
<td>.26</td>
<td>.25</td>
<td>1.73</td>
</tr>
<tr>
<td>Children’s Interpersonal Skills</td>
<td>1.33</td>
<td>.28</td>
<td>.00*</td>
<td>1.78</td>
</tr>
<tr>
<td>Children’s Cultural Acquisition</td>
<td>1.12</td>
<td>.29</td>
<td>.00*</td>
<td>1.28</td>
</tr>
</tbody>
</table>

It also shows a statistically significant association between the likelihood of students obtaining high academic achievement and their interpersonal skills (p=.00). The results of this study (B=1.33, Exp. (B)=1.78) show a statistically significant association that if students’ interpersonal skills are to increase by one unit, we also expect to see an increase of 1.33 unit in the ordered log-odds of them achieving high academic achievement, while holding all other
variables constant. That is, children with better interpersonal skills are 78% more likely to achieve high academic levels than low academic level.

Also, the results in Table 8 demonstrate that children’s cultural acquisition is a statistically significant factor contributing to the likelihood of obtaining high academic achievement ($p=0.00$). According to its regression coefficient ($B=1.12$, Exp. ($B$)=$1.28$) for an increase in students’ cultural acquisition ability by one unit, we also expect to see the ordered log-odds increase, while holding all other variables constant. The ordered log-odds of obtaining high academic achievement are expected to increase by 1.12 unit when students’ ability to adapt Taiwanese culture are to increase by one unit. That is, children who have better cultural acquisition ability are 28% more likely to obtain higher academic achievement.

In terms of the relationship between children’s language acquisition and children’s obtaining high academic achievement, no significant effect was found in this study. Also, the results show no significant effect of children’s school adaption on obtaining high academic achievement.

**Multinomial Regression for Student Obtaining Higher Academic Achievement**

I also used the stepwise multinomial logistic regression model to predict the likelihood of students being in a higher academic achievement level, for a one-unit increase in predictor variables. The results of multinomial regression model provide a general analysis of the ordered log-odds estimate of a certain independent variable for students obtaining higher academic achievement category, while the other variables are held constant in the model. Table 9 demonstrates the likelihood of students obtaining higher academic achievement, if there was a one-unit increase in mother’s immigration status, children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition.
The results of Table 9 show how a one-unit increase in each independent variable improves or decreases the likelihood of students being in a higher achievement category. It indicates that mother’s immigration status (1: Non-Taiwanese CI/PR mothers; 0: Taiwanese CI/PR mothers) is statistically significant (p=0.00) in the model. According to its regression coefficient (B=.67, Exp. (B)= 1.34), it is 34% more likely that children who have non-Taiwanese CI/PR mothers to obtain higher academic achievement compared to children who have Taiwanese CI/PR mothers. Specifically, for an one-unit increase in mother’s immigration status (from Taiwanese CI/PR to non-Taiwanese CI/PR), the ordered log-odds of children who have non-Taiwanese CI/PR mothers to obtain higher academic achievement would be expected to increase by .67 unit, while holding children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition constant.

**Table 9.** Regression coefficient and odds ratio for factor associated with student’s academic achievement being in a higher achievement level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Sig. (p)</th>
<th>Exp. (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Immigration Status</td>
<td>.67</td>
<td>.21</td>
<td>.00*</td>
<td>1.34</td>
</tr>
<tr>
<td>Children’s Language Acquisition</td>
<td>-.13</td>
<td>.15</td>
<td>.40</td>
<td>.88</td>
</tr>
<tr>
<td>Children’s Adaption in School</td>
<td>.25</td>
<td>.18</td>
<td>.16</td>
<td>1.28</td>
</tr>
<tr>
<td>Children’s Interpersonal Skills</td>
<td>.45</td>
<td>.16</td>
<td>.00*</td>
<td>1.57</td>
</tr>
<tr>
<td>Children’s Cultural Acquisition</td>
<td>.67</td>
<td>.18</td>
<td>.00*</td>
<td>1.95</td>
</tr>
</tbody>
</table>

*Statistically significant at 0.05 α level.

It also shows a statistically significant association between students’ obtaining higher academic achievement and their interpersonal skills (p= .00). The results of this study (B=.45, Exp. (B)=1.57) show that if students’ interpersonal skills are to increase by one unit, we also expect to see an increase of .45 unit in the ordered log-odds of them achieving higher academic achievement, while holding all other variables constant. That is, children with better interpersonal skills are 57% more likely to achieve higher academic levels.
Also, the results in Table 9 demonstrate that children’s cultural acquisition is a statistically significant factor to obtaining higher academic achievement \( (p = .00) \). According to its regression coefficient (\( B = .67, \text{Exp. (B)} = 1.95 \)), for an increase in students’ cultural acquisition ability by one unit, we also expect to see the ordered log-odds increase of them being in higher academic achievement. The ordered log-odds of being in higher academic achievement are expected to increase by .67 units when students’ culture acquisition ability is to increase by one unit. That is, children who have better cultural acquisition ability are 95% more likely to obtain higher academic achievement.

In terms of the relationship between children’s language acquisition and children’s obtaining higher academic achievement, no significant effect was found in this study. Also, the results show no significant effect of children’s school adaption on obtaining higher academic achievement.

**Multinomial Regression for Student Obtaining Higher Academic Achievement Living in Urban Areas**

Given the majority of the sample (\( n = 628, 78.2\% \)) of this study lives in urban areas of Taiwan, I investigated if mother’s immigration status, children’s school adaption, children’s language acquisition, children’s interpersonal skill, and children’s cultural acquisition play significant roles in children living urban areas to obtain higher academic achievement. I controlled the variable of “urban school districts”, and used the stepwise multinomial logistic regression model to predict the likelihood of students being in a higher academic achievement level, for a one-unit increase in predictor variables.

**Table 10.** Regression coefficient and odds ratio for factors associated with urban student’s academic achievement being in a higher achievement level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Sig. (p)</th>
<th>Exp. (B)</th>
</tr>
</thead>
</table>

The results of Table 10 show how a one-unit increase in each independent variable improves or decreases the likelihood of urban students obtaining higher achievement category. It indicates that mother’s immigration status (1: Non-Taiwanese CI/PR mothers; 0: Taiwanese CI/PR mothers) is statistically significant ($p=0.02$) in the model. According to its regression coefficient ($B=.54$, $Exp.(B)=1.19$), it is 19% more likely that urban children who have non-Taiwanese CI/PR mother to obtain higher academic achievement compared to urban children who have Taiwanese CI/PR mothers. Specifically, for an one-unit increase in mother’s immigration status (from Taiwanese CI/PR to non-Taiwanese CI/PR), the ordered log-odds of urban children who have non-Taiwanese CI/PR mothers to obtain higher academic achievement would be expected to increase by .54 unit, while holding urban children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition constant.

It also shows a statistically significant association between urban students’ obtaining higher academic achievement and their interpersonal skills ($p=.00$). The results of this study ($B=.87$, $Exp.(B)=1.23$) show that if urban students’ interpersonal skills are to increase by one unit, we also expect to see an increase of .87 unit in the ordered log-odds of them achieving higher academic achievement, while holding all other variables constant. That is, urban children with better interpersonal skills are 23% more likely to achieve higher academic levels.
Also, the results in Table 10 demonstrate that children’s cultural acquisition is a statistically significant factor to children living in urban areas to obtain higher academic achievement ($p= .00$). According to its regression coefficient ($B= .72$, Exp. (B)$=1.87$), for an increase in urban students’ cultural acquisition ability by one unit, we also expect to see the ordered log-odds increase of them being in higher academic achievement. The ordered log-odds of being in higher academic achievement are expected to increase by .72 units when urban students’ culture acquisition ability is to increase by one unit. That is, urban children who have better cultural acquisition ability are 87% more likely to obtain higher academic achievement.

In terms of the relationship between children’s language acquisition and children’s obtaining higher academic achievement, no significant effect was found in this study. Also, the results show no significant effect of children’s school adaption on obtaining higher academic achievement.

**Interactive Effects between Independent Variable on Student Obtaining Higher Academic Achievement**

In order to investigate the interactive effects between independent variables on students obtaining higher academic achievement, the research made the mother’s immigration status the first-order variable and added each independent variable one at a time in the following order: mother’s immigration status, children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and lastly children’s cultural acquisition. The results in Table 10 show the effect of each independent variable on mother’s immigration status and students obtaining higher academic achievement. It shows that mother’s immigration status ($I$: Non-Taiwanese CI/PR mothers; $0$: Taiwanese CI/PR mothers) is a significant factor to children obtaining higher academic achievement. According to its regression coefficients, it is 34% more
likely that children who have non-Taiwanese CI/PR mothers to obtain higher academic level, compared to children of Taiwanese CI/PR mothers.

**Table 11.** Regression coefficient and for factors associated with student’s obtaining higher academic achievement level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Exp.(B)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Immigration Status</td>
<td>1.34*</td>
<td>1.56*</td>
<td>1.76*</td>
<td>1.82*</td>
</tr>
<tr>
<td>Children’s Language Acquisition</td>
<td>.33</td>
<td>.46</td>
<td>.59</td>
<td>.93</td>
</tr>
<tr>
<td>Children’s Adaption in School</td>
<td>1.98</td>
<td>.49</td>
<td>1.88</td>
<td></td>
</tr>
<tr>
<td>Children’s Interpersonal Skills</td>
<td>1.67*</td>
<td>1.92*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children’s Cultural Acquisition</td>
<td>1.75*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Statistically significant at .05 α level.

The effect of mother’s immigration status on student obtaining higher academic achievement is aggravated when children have better interpersonal skills. The results show that children who have better interpersonal skills are 67% more likely to obtain higher academic achievement. Both the effects of mother’s immigration status and children’s interpersonal skills are statistically significant factors to children obtaining higher academic achievement. In addition, the effect of mother’s immigration status is slightly mitigated when children have better cultural acquisition ability. The results show that children’s advancement in cultural acquisition ability is a statistically significant factor to children’s obtaining higher academic achievement. That is, children who have better cultural acquisition are 75% more likely to obtain higher academic achievement.

Therefore, the results in Table 10 indicate the interactive effects between three statistically significant factors: a) The likelihood of children whose mothers are non-Taiwanese CI/PR to achieve higher academic achievement increases by 48% if there is also a one-unit increase in their interpersonal skills, b) the likelihood of children whose mothers are non-Taiwanese CI/PR to achieve higher academic achievement decreases by 4% if there is also a
one-unit increase in their cultural acquisition ability, c) the likelihood of children who have better interpersonal skills to obtain higher academic achievement increases by 25% if there is a one-unit increase in their cultural acquisition ability.

In terms of the interactive effect between children’s language acquisition and children’s obtaining higher academic achievement, no significant effect was found in this study. Also, the results show no significant interactive effect of children’s school adaption on obtaining higher academic achievement.

**Students Obtaining Excellent Academic Achievement than Other Achievement Levels**

In addition, another stepwise logistic regression was used in this study is to examine the expected change in log odds of children obtaining excellent academic achievement rather than other academic levels (good, average and poor), for a one-unit increase in each predictor variable. The I coded excellent academic achievement as 1, and all other achievement levels (good, average, and poor) as 0, and used stepwise logistic regression to examine the effect of mother’s immigration status, children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition on children’s academic achievement being in excellent than all other academic levels.

The results of comparison between the likelihood of children obtaining excellent academic achievement than other academic levels are presented in Table 11. It shows that mother’s immigration status (1: Non-Taiwanese CI/PR mothers; 0: Taiwanese CI/PR mothers) is statistically significant (p=0.00) in the model. According to its regression coefficient (B=1.29, Exp. (B)=1.45), it is 45% more likely that children who have non-Taiwanese CI/PR mothers to obtain excellent academic achievement than other academic levels, compared to children who have Taiwanese CI/PR mothers. Specifically, for one-unit increase in mother’s immigration
status (from Taiwanese CI/PR to non-Taiwanese CI/PR), the ordered log odds of their children to obtain excellent AA would be expected to increase by 1.29 unit, while holding children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition constant.

**Table 12.** Regression coefficient and odds ratio for obtaining excellent academic achievement and other associated factors.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Sig. (p)</th>
<th>Exp. (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Immigration Status</td>
<td>1.29</td>
<td>.32</td>
<td>.00*</td>
<td>1.45</td>
</tr>
<tr>
<td>Children’s Language Acquisition</td>
<td>-.24</td>
<td>.23</td>
<td>.30</td>
<td>.79</td>
</tr>
<tr>
<td>Children’s Adaption in School</td>
<td>.26</td>
<td>.27</td>
<td>.33</td>
<td>1.29</td>
</tr>
<tr>
<td>Children’s Interpersonal Skills</td>
<td>.53</td>
<td>.28</td>
<td>.00*</td>
<td>1.70</td>
</tr>
<tr>
<td>Children’s Cultural Acquisition</td>
<td>.27</td>
<td>.24</td>
<td>.03*</td>
<td>1.31</td>
</tr>
</tbody>
</table>

*Statistically significant at .05 α level.

Table 11 also shows a statistically significant factor between children’s interpersonal skills and the likelihood of obtaining excellent academic achievement rather than other academic levels ($p=.00$). According to its regression coefficients (B=.53, Exp. (B)=1.70), The results indicate that for an one-unit increase in children’s interpersonal skill, there will also be an increase by .53 unit in the log odds to obtain excellent academic achievement rather than other academic levels. That is, children with better interpersonal skills are 70% more likely to obtain excellent academic achievement than other academic levels.

Children’s cultural acquisition is also a significant factor ($p=.03$) to the likelihood of obtaining academic achievement than other achievement levels. According to its regression coefficients (B=.27, Exp. (B)=1.31), if children’s ability to adapt cultural were to increase by one-unit, we also expect to see an increase by .27 unit for them to obtain excellent academic achievement than other achievement levels. That is, children who better cultural acquisition ability are 31% more likely to achieve excellent academic level than other achievement levels.
In terms of the relationship between children’s language acquisition and children’s obtaining excellent than other academic achievement levels, no significant effect was found in this study. Also, the results show no significant effect of children’s school adaption on their obtaining excellent than other academic achievement levels.

**Review and Summary of Results**

In this study, the purpose was two-fold. First, to specifically examine the degree of how low-educated mother’s immigration status affects their children’s academic achievement; second, to investigate the degree of how other factors associated with mother’s low educational level also affect their middle school children’s academic achievement in Taiwan. Additionally, the interactive effects between mother’s immigration status, and four other factors are also included in order to examine how each identified factor mitigates or aggravates any effect of mother’s immigration status on their children’s academic achievement.

The first section of this chapter focuses on the bivariate analysis for all variables, including correlation matrix between all variables and the collinearity statistics between the outcome and predictor variables. The results suggest moderate to good relationships between independent and outcome variable, and there is also no indication of collinearity between outcome and predictor variables.

The second section presents the statistical results for two main focuses in this study: how low-educated mother’s immigration status, and four other variables of children’s characteristics of behaviors affect children’s academic achievement.

**Significance of Mother’s Immigration Status**

When exploring the degree of impact between low-educated mother’s immigration status and their middle-school children’s academic achievement, the results of all logistic regressions in
this study show a consistent statistically significant degree of association between mother’s immigration status and their children obtaining higher or excellent academic achievement. That is, children who have non-Taiwanese CI/PR mothers are more likely to obtain higher academic achievement compared to their counterparts of Taiwanese mothers, while holding all other variables constant.

Also, the effect of mother’s immigration status on children obtaining higher academic achievement is aggravated when children have better interpersonal skills, but slightly mitigated when children’s have better cultural acquisition. That is: a) the likelihood of children of non-Taiwanese CI/PR mothers to achieve higher academic levels increases if they also have better interpersonal skill. But the likelihood of children of non-Taiwanese CI/PR mothers to obtain higher academic level decreases if they have better cultural acquisition ability, b) middle school students who have non-Taiwanese mothers are more likely to have better interpersonal skills, but less likely to have better cultural acquisition ability.

This result is also consistent with the results in logistic regressions estimating student obtaining excellent academic achievement rather than other achievement levels: that is, the odds of children having non-Taiwanese CI/PR mothers to obtain excellent academic achievement than other achievement levels increase compared to children of Taiwanese CI/PR mothers. In other words, children of non-Taiwanese CI/PR mothers are more likely to obtain excellent than other academic standings, compared to children of Taiwanese-CI/PR mothers, while holding all other variables constant.

**Significance of Children’s Interpersonal Skills**

In terms of children’s interpersonal skills, the results also suggest its statistically significant associations in all models. In all levels of children’s interpersonal skills, any level of
advancement is statistically significant for to obtain higher academic achievement. Also, the likelihood of children obtaining excellent academic achievement rather than other achievement levels increases, if there was also an increase in their interpersonal skill.

**Significance of Children’s Cultural Acquisition**

For children’s cultural acquisition, the results also reveal its statistically significant association with children obtaining higher academic achievement. That is, children’s advancement in cultural acquisition by one unit, there will be an increase in the logs odds of them obtaining higher academic achievement levels. Similarly, for a one-unit increase in their cultural acquisition ability, we also expect to see an increase in the logs odd of them obtaining excellent academic achievement rather than other achievement levels.
CHAPTER 5
DISCUSSION

Currently in Taiwan, nearly thirteen percent of the middle school students were born to new immigrant mothers. Most immigrant mothers immigrated to Taiwan from mainland China, Vietnam, Indonesia, and other Southeast Asian countries in the past decade because of their marriages with Taiwanese citizens. Like many native low-educated Taiwanese mothers, most new immigrant mothers also have lower educational attainment—completion of middle school or lower in their home countries. In addition to their educational disadvantages, new immigrant mothers, particularly those from Southeast Asian countries, face certain cultural and racial challenges in Taiwan’s society. For new immigrant mothers from mainland China, they encounter less serious adjustment issues and discrimination.

However, in addition to the discussion regarding educational, social, cultural and racial impact of mother’s low educational attainment, little research has been done to examine how immigration-related factors, such as parent’s immigration status or gaining Taiwanese citizenship, may impact the academic achievement of children of low-educated new immigrant mothers in Taiwan’s context. As new immigration mothers and their children are considered as “voluntary minorities” in Taiwan’s society, there may be positive influences of parent’s immigrant status, the power of community forces, voluntary minority’s positive identity, and attitudes towards school that contribute to their children’s obtaining higher academic achievement (Jin, 2001; Ogbu & Simons, 1998;; Wu, 2009).

Given the rapid increase of children of new immigrant mothers in Taiwan’s middle schools, Taiwan’s Ministry of Education (MOE) since 2015 has urged school leaders and practitioners to perceive a holistic understanding concerning this group of students. MOE’s
policy recommendations include: to preserve mother’s family heritage; to gain better understandings of immigration-related issues; to provide more comprehensive educational, social, economic, and career counseling resources for new immigrant mothers and their children; to promote mother language education, and to enhance curricular diversity in local schools (Hsia et al., 2007; Wu, 209). This study incorporates five main aspects of MOE’s 2015 proposal, including issues regarding mother’s immigration status and the impact of mother’s educational attainment on their children: children’s language acquisition, adaption in school, interpersonal skills, cultural acquisition, and also the relationship between these variables and children’s academic achievement.

Among these facets, many researchers believe that the knowledge regarding immigration policy is the least noticed and recognized area by school leaders and practitioners (Huang, 2011; Huang & Tang, 2007; Lai 2012; Wu, 2009). Previous research suggested that school leaders and practitioners’ understanding of immigration-related issues is crucial, not only because it enhances school’s diversity, but it also structures opportunity for children of new immigrants (Cheng, 2015; Holdaway et al., 2009). When school leaders acquire better understanding of immigration-related issues, they are more likely to create a diverse and welcoming environment for children of new immigrants, and more importantly, to provide them with more opportunity to succeed academically (Kao, Vaquera, & Goyetee, 2013).

Therefore, with the intent of developing a better understanding of how low-educated new immigrant mothers’ immigration status and other factors may affect their children’s academic achievement, in this chapter I present the findings of two research focuses of this study: first, to explore the degree to which mother’s immigration status is statistically significant to children’s academic achievement in Taiwan. Secondly, to investigate the degree to which factors related to
mother’s low educational attainment (children’s language acquisition, adaptation to school, interpersonal skills, and cultural acquisition) may also impact middle school students’ academic achievement. In addition, and this study also investigates interactive effects between mother’s immigration status and four other identified factors.

**Variables with Significant Results for Students Achieving Higher Academic Levels**

In this section, I present variables that are statistically significant to children obtaining higher or excellent academic achievement in this study, including mother’s immigration status, children’s interpersonal skills, and children’s cultural acquisition ability. Additionally, this study indicates the interactive effects between three significant variables of mother’s immigration status, children’s interpersonal skills, and children’s cultural acquisition. That is, children who have better interpersonal skills aggravates the effect of mother’s immigration status on their obtaining higher academic achievement levels, but the effect was slightly mitigated by children who have better cultural acquisition. Overall, the impact of mother’s immigration status, children’s interpersonal skills, and children’s cultural acquisition are statistically significant factors in all regression models.

**Mother’s Immigration Status**

Although many previous research regarding assimilation and socioeconomic transfer theory showed negative impact of mother’s race, ethnicity, lack of immigration status, social and economic status on their children’s academic achievement, the results of this study demonstrated that children of immigrant parents have higher educational attainment (Chen & Yu, 2005; Hagy & Staniec, 2002; Marks & Coll, 2012; Ogbu & Simons, 1998). Similar to many previous research studies regarding the theory of immigration paradox and voluntary immigrant minorities, the results of this study showed positive impacts of parents’ lack of immigration status on their
children’s academic achievement (Coll & Marks, 2012; Kao, Obgu & Simons, 1998; Kao, Vaquera, & Goyetee, 2013). Zhou et al. (2014) also argued that in Taiwan’s middle school, there is no significant difference in school adjustment, language ability, learning and analytical ability between children of Taiwanese mothers and children of new immigrant mothers. Their research findings regarding children of new immigrant mothers having equivalent or even better learning and analytic ability are similar to the results of this study.

The theory of immigration paradox—timing and process of adjustment for children who have immigrant parents. Many researchers investigated why certain children of new immigrant parents have higher educational attainment, and concluded that after children’s adjustment for their parental social and immigration status, children of new immigrant parents are more likely to outperform their peers of native-born parents, because the process of forming real self and social identity inspires them to have higher educational aspirations and expectations (Cheng, 2015; Qian and Blair, 1999; Tam, 2008). That is, the process and timing of overcoming discrimination enhances stronger social immersion for children of immigrant parents, and motivates them to outperform their peer academically (Deng, 2000, Kao, Vaquera, & Goyetee, 2013).

Given the sample of this study being middle school students, the results in this study confirmed one aspect of immigration paradox theory—time and process of adjustment is crucial for children of new immigrant parents. As middle school is considered as the second stage of Taiwan’s compulsory education after six years of elementary school education, middle school students who have new immigrant mothers may have gone through the stage of adjustment for their parents’ social and immigration status. Children of new immigrant mothers in middle school also have passed through the process of forming real self and Taiwanese identity that may
enable them to overcome discrimination and inspired them to have higher educational aspiration and expectations. Thus, the results in this study confirmed that children of new immigrant parents would have higher educational expectations and achievement, and tend to outperform their peer of native parents, after a period time of adjustment, including the adjustment of parental social and immigration status, the forming real self and Taiwanese identity, and overcoming of discrimination (Chen & Yu, 2005; Kao & Tienda, 1995).

**Cultural-ecological theory—the positive power of community forces.** The results of this study also confirmed Ogbu’s cultural-ecological theory of school performance and the power of community forces. Ogbu and Simons (1998) argued that the education of children of voluntary immigrant minorities was positively influenced by the community forces, parents’ strong commitment to their children’s academic succeeding, and role models among voluntary immigrant minorities. Voluntary immigrants’ positive collective identity towards their host countries also contributes to better school performance of their descendants, even under poor instruction (Ogbu & Simons, 1998). In Taiwan’s context, as the majority of new immigrant mothers are considered as voluntary immigrant, they hold pragmatic and positive towards school and respond to the dominate culture and language by overcoming the culture and language barrier by learning the difference, see it as additive that will enable their children to succeed in school (Ogbu & Simons, 1998). Also, the influence of pan-Chinese culture of academic excellence and children’s schooling prevails among both mainland Chinese immigrant mothers and Southeast Asian immigrant mothers. (Wu, 2009, Yu, 2004). These positive characteristics of voluntary immigrants all contribute to their children’s better academic achievement in Taiwan’s context.
Children of mainland Chinese immigrant mothers living in urban areas tend to outperform their peers of Taiwanese citizen mothers. As described in chapter three, there are two pieces of important demographic information of the sample that help to explain why children of new immigrant mothers tend to outperform their peers of Taiwanese citizen mothers in this study: a). The majority of new immigrant mothers come from mainland China. b). The majority of new immigrant mothers and their children live in urban areas of Taiwan.

Previous studies showed that where there is a large number of new immigrant mothers from mainland China among immigrant communities, their children have better chance to outperform children of Taiwanese mothers because of mainland Chinese mothers’ positive attitudes and shared educational values towards schools. Also, collective identity and parents’ commitment to children’s better education, hard work, and role models are much stronger in communities where a large number of mainland Chinese mothers are part of. Thus, pragmatic and positive attitudes towards schools, stronger commitment to children’s better education, and community forces are all contributing factors to why children of immigrant minorities do better in school among communities, where a large number of Chinese immigrant mothers and their families reside (Deng, 200; Hsia, 2009, Ogbu & Simons, 1998).

Moreover, many researchers argued that children of new immigrant mothers have access to certain social and educational incentives provided exclusively to them that other groups of student would not enjoy otherwise (Chen & Yu 2005; Tsai & Huang, 2011). For example, in many school districts in Taiwan, new immigrant mothers and their children are eligible for special after-school programs, scholarships, special career counseling, cultural and language diversity programs, cheaper national health insurances, and etc. (Taiwan National Immigration Agency, 2018). Liu et al. (2009) believed that these educational incentives provide a better
opportunity for children who already do well in academics to do even better academically, compared to other groups of students.

Such educational resources and incentives are even more comprehensive and accessible in urban school districts. Previous research confirmed that children of new immigrant mothers living in urban areas take advantage of certain educational resources and incentives that those living in rural areas would not enjoy otherwise (Zhen, 2012). Chen et al. (2005) also argued that particular educational resources and incentives provided to children of immigrant mothers living in urban areas, like Taipei and Kaohsiung city, play a significant role in student’s obtaining higher academic achievement (Chen, 2005; Chiu et al, 2008; Hsia, 2009). Chiu et al. (2008) also indicated in their case studies that children of new immigrant mothers in certain school districts in Taipei metropolitan areas had better access to certain educational resources that contribute to their achieving better academic performance than their peers of Taiwanese mothers. Hsia (2009) also believed that these educational resources and incentives provided to children of new immigrant mother assist those who already have high academic achievement to do even better, particularly in urban school districts. Therefore, given the majority of children and their families in this study resides in Taiwan’s urban areas, it is more likely that these children have better chance to outperform their counterparts of Taiwanese mothers. The results of this study also confirmed that the social and educational incentives provided to new immigrant mothers and their children may be effective for them achieving better academic outcomes.

**TEPS assessment validity.** Many previous research studies that examined middle school students’ academic achievement in Taiwan were based on the results of Joint High School Entrance Exams and on many case studies in different school districts (Hsia, 2009; Wen, 2006; Wu 2009). This study, however, is based on the first national educational longitudinal database
TEPS, and thus the results are subjected to TEPS’s assessment validity (Chen, 2010; Huang et al., 2010; Wu, 2004). TEPS researchers designed a Comprehensive Analytical Ability Test (CAAT), which combines both cognitive and non-cognitive ability tests in behavior, mental health status, civic orientations, value and attitudes, with academic subjects in analytical ability, science, mathematics, Chinese, and English (Yu, 2005; Zhou, 2004). Thus, the results of this study showed a broad scale of student sample based on TEPS database, compared to the scale of Joint High School Entrance Exam and case studies in other previous studies.

That said, it is likely that children having new immigrant mothers tend to do better in CAAT rather than High School Entrance Exams or other achievement measurements. In addition, as High School Entrance Exams is the once-for-all exam that determines middle school students’ future academic or even career paths, the results of it are often more emphasized than other academic measurements in previous studies. Thus, based on TEPS measurement of academic achievement, the results of this study provided a different perspective that children of new immigrant mother are likely to outperform children of Taiwanese citizen mothers.

**Children’s Interpersonal skills**

Similar to previous research studies regarding the positive impact of children who have better interpersonal skills on their academic achievement, the findings in this study also suggest that children’s interpersonal skills is a significant factor for children’s obtaining higher or excellent academic achievement levels rather than other levels (Zhou et al., 1998; McClelland, 2006). That is, for a one-unit advancement in students’ interpersonal skills, we also expect to see an increase in the likelihood of them obtaining higher or excellent academic achievement level.

As previous research studies indicated, middle school is a crucial stage of one’s adolescent years, and interpersonal skills, such as peer support and network, forming of self-
identity and self-concept, emotional awareness and association with others, are all significant factors for adolescents’ academic achievement and school’s adjustment (Dong, 2003; Guo, 2005; Tsai & Huang, 2011; Wu, 2004; Xiong, 2004). Having good interpersonal skills or more friendships is also commonly considered as important contributor to middle school students’ academic achievement and transitioning (McClelland et al., 2006).

Similarly, in Taiwan’s context, many researchers confirmed that middle school students in Taiwan even value their friendships and interpersonal skills more importantly than their school work, language ability, school adaption and, etc. (Huang & Tang, 2007; Tian & Wang, 2006). Particularly, when dealing with unprecedented pressure of High School Entrance Exams in Taiwan, having better interpersonal skills and friendships are an important support system and motivator for middle students to achieve higher academic levels (Chiu et al., 2008; Huang et al. 2010; Wu, 2009). Also, Chen et al (2008) confirmed that good interpersonal skills and friendships are inseparable factors of forming middle-school students’ self-identity and self-confidence that are proven to be significant influencers to children’s academic achievement. Thus, the findings in this study confirmed that the advancement in interpersonal skills or friendship would more likely for middle school students in Taiwan to obtain better or excellent academic achievement levels.

Children’s cultural acquisition

Similar to the previous research, the findings in this study indicated that cultural acquisition ability is a significant factor to children’s obtaining higher or excellent academic achievement. That is, for a one-unit advancement in students’ cultural acquisition ability, we also expect to see an increase in the likelihood of them obtaining higher or excellent academic levels.
Many researchers believed that cultural acquisition is a process of learning, which involves family, school, society, and people groups for adolescents. Children’s cultural acquisition is also an important predictor and significant contributing factors for middle school student’s social and educational development (Van Schaik & Burkart, 2011). In Taiwan’s context, one of the most important aspects of cultural impact on children’s academic achievement is the emphasis of academic excellence in pan-Chinese culture. Many researchers believed that the underlying belief of academic excellence plays a critical role in children’s motivation of obtaining higher academic achievement, particularly for middle school students (Deng, 2000; Zhou, 2004).

Wu (2009) argued that most middle school students in Taiwan first experience the pressure of academic excellence due to the upcoming competitive regional Joint High School Entrance Exams. Thus, how they perceive the pan-Chinese cultural of academic excellence from their parents, school and peers may be a motivator for their academic achievement. Also, as the High School Entrance Exams is believed to be decisive for student’s future academic path (either to vocational schools or colleges in a near future), children’s cultural perception of how their future career paths would be is a particular crucial factor to their academic achievement (Huang, 2009; Wu, 2009). The results of this study show that it is more likely that children’s cultural acquisition of academic excellence is a statistically significant factor for them to obtain higher academic achievement levels, when parents, schools, society, and educational system around them are all evolved around the idea of academic excellence.

**Interactive Effects between Mother’s Immigration Status, Children’s Interpersonal Skills, and Children’s cultural Acquisition**
In terms of the interactive effects between mother’s immigration status, children’s interpersonal skills, and children’s cultural acquisition, the results of this study show that: a) The likelihood of children with non-Taiwanese CI/PR mothers obtaining higher academic achievement increases if those children also have better interpersonal skills, b) the likelihood of children with non-Taiwanese CI/PR mothers obtaining higher academic achievement slightly decreases if those children have better cultural acquisition ability, and c) the likelihood of children who have better interpersonal skills obtaining higher academic achievement increases if those children also have higher cultural acquisition ability.

Similar to the previous discussion, middle-school students’ interpersonal skills and friendships are crucial to their obtaining higher academic achievement in addition to mother’s immigration status, for better interpersonal skills increases the likelihood by 32% for children of non-Taiwanese CI/PR mothers to achieve higher academic levels. Also, the likelihood of children who have better cultural acquisition ability to obtain higher academic achievement increases by 25%, if they also have better interpersonal skills. The results are similar to the previous discussion that children’s cultural acquisition, particularly in regard to pan-Chinese culture of academic excellent, is a statistically significant factor to middle-school students’ academic achievement.

However, having better cultural acquisition ability slightly decreases the likelihood by 3% for children of non-Taiwanese CI/PR mothers to obtain higher academic achievement. Many researchers argued that in Taiwan’s context, the relationship between new immigrant mothers and their children’s cultural acquisition is often more complicated than children who have both Taiwanese parents because of the cultural identity or conflicts in the families of new immigrant parents (Huang et al, 2007; Wu, 2004). In this study, since the focus of children’s cultural
acquisition is more related to the academic excellence rather than other aspects of cultural identity or conflicts, and also given the results of it slight mitigation effects, it requires further investigation on detailed relationships between mother’s immigration status and children’s cultural acquisition ability.

**Implications for Middle School Leaders and Practitioners**

With the findings in this study, middle school leaders in Taiwan may be able to better understand the impacts of mother’s immigration status, children’s interpersonal skills, children’s cultural acquisition on middle school students’ academic achievement. I proposed four implications for middle school leaders and practitioners based on the results of this study.

**Stigma reduction.** Despite of prevalent stigma and discrimination against new immigrant mothers and their children, middle school leaders and practitioners should consider children of new immigrant mothers having great potentials to achieve higher academic levels. The results of this study indicated that children who have non-Taiwanese CI/PR mothers are more likely to obtain higher or excellent academic standings, particularly for children who have mainland Chinese mothers living in urban areas of Taiwan. Therefore, school leaders should overcome the prevalent stigma and discrimination against new immigrant mothers in Taiwan’s society, and be very careful to avoid any negative tagging of children who were born to non-Taiwanese citizen mothers. Also, it is critically important for school leaders and practitioners to reassure a welcoming atmosphere and pursue educational diversity in school and classroom that would provide an equal opportunity for academic success for children of both Taiwanese citizens and new immigrant mothers.

School leaders and practitioners should also encourage creating positive community forces among voluntary immigrant minorities, particularly among mainland Chinese
communities in urban areas of Taiwan. Ogbru and Simons (1998) argued that community forces among voluntary immigrants are significant factors contributing to their children’s high academic achievement. The results of this study also found that Chinese immigrant mothers particularly take advantage of language and cultural similarity in Taiwan’s society, and their positive and pragmatic attitude towards school significant help their children for better academic achievement. However, because of the complicated political relationship between mainland China and Taiwan, mainland Chinese mothers and their children are still easy to be tagged as “different” in Taiwan’s society. Therefore, it is critically important for school leaders and practitioner to avoid this type of negative tagging, and ensure children of mainland Chinese mothers to enjoy the diversity and a comprehensive educational resources and incentives provided to them and their families.

**Educational equity and diversity.** Middle school leaders in Taiwan must recognize their roles in shaping Taiwan’s educational and immigration reforms in the next decade, and support for educational resources and incentives provided to new immigrant mothers and their children. The Ministry of Education (MOE) in recent years has been committed to educational equity and diversity in local school level because of the increasing needs of children of new immigrant mothers. However, MOE’s proposals and commitment cannot be realistic and feasible without practical inputs and enormous experiences from local school leaders and practitioners who have worked with children of new immigrant mothers for many years at the frontline. Thus, school leaders and practitioners’ attitude and understanding of how children of new immigrant mothers are more likely to outperform children who have both Taiwanese parents will be critical to MOE’s future policy proposals.
Also, as discussed above, many researchers believed that one important factor contributing to children of new immigrant mothers having higher academic achievement is the continual educational incentives provided to them in local school level (Chen & Yu 2005; Tsai & Huang, 2011). Middle school leaders and practitioners should continue to support this type of educational incentives when it comes to creating an equal opportunity or educational diversity for children of new immigrant mothers. As many researchers predicted that children of new immigrant mothers is becoming and will continue to be an important focused group in Taiwan’s educational reforms in the next decade, school leaders’ support for educational incentives, equal educational opportunity, and educational diversity for children of new immigrant mothers will set tones for MOE and the Central Government’s future reforms.

In additional to the contribution to Taiwan’s future educational reforms, middle school leaders should have voice when it comes to Taiwan’s immigration policy reforms. In Taiwan’s context or any pan-Chinese culture, education policy is often considered one of the most significant factors that may affect many areas of the government’s legislation. Therefore, middle school leaders in Taiwan should take advantage of their positions, and provide a perspective from working with new immigrant mothers and their children for future immigration policy reforms.

**School climate.** As interpersonal skills and friendships are important contributing factors to children of low-educated mothers obtaining higher academic achievement in middle school, school leaders should assure a friendly school environment that encourages more meaningful engagement and interactions among students from diverse backgrounds. Middle schools in Taiwan are often referred as “the end of happy childhood” because of the upcoming High School Entrance Exam taking place at the end of third school year (Wu, 2009). Under such pressure,
school environment is often intense, and most school leaders also consider the upcoming Exam the only priority in student’s life (Tsai, 2006).

With the findings in this study, middle school leaders should realize that the social factor of having better interpersonal skills and friendships is critical for children’s better academic achievement. Jin (2011) argued that “being cool” or “feeling welcomed by friends” is such a critical factor in middle school students’ school life that would likely shape students’ self-identity, self-confidence, emotional awareness, and educational outcomes in their teen years. Therefore, in addition to making much emphasis on the importance of academic achievement or High School Entrance Exam, middle school leaders should also focus on creating a friendly school environment that would encourage, strengthen, and foster more meaningful engagement and interaction between students.

In practical ways, middle school leaders should propose certain action plans to improve students’ interpersonal skills and foster meaning friendships and engagement among students. Many researchers suggested school leaders to take initiative in offering communication skill, problem-solving, negotiation, and decision-making curriculum in social science, or establishing student clubs that would encourage student engagement and meaningful friendships (Lin, 2013; Tsai et al, 2011).

**Holistic Cultural Perspective.** As children’s cultural acquisition is a significant factor to their obtaining higher academic achievement level, middle school leaders and practitioners should pursue cultural diversity and also offer a more holistic understanding of academic excellent, which is often overly emphasized in Taiwan’s culture. As the results in this study show that children who have better cultural acquisition are more likely to obtain higher academic achievement levels, school leaders should realize their important roles in shaping middle
students’ cultural acquisition ability. Many researchers believed that cultural acquisition is a process of learning, which involved students’ family, school, society, and people group around them. Thus, students’ cultural acquisition ability is considered as an important predictor for students’ overall social and educational development (Van Schaik & Burkart, 2011).

In Taiwan’s context, among other aspects of family, society, and people groups, school is commonly regarded as the most important influencer of students’ cultural acquisition (Deng, 2001; Zhou, 2004). Thus, to enhance students’ better cultural acquisition ability, middle school leaders should consider promoting cultural diversity and create a welcoming culture for different people groups, including new immigrant mothers and their families. In response to MOE’s guidelines, school leaders could support individual student’s own cultural identity and assure curriculum diversity to enhance middle school students’ cultural acquisition ability (Taiwan Ministry of Education, 2015).

On the other hand, middle school leaders should also consider providing a more balanced and holistic view of academic excellence, which is often overly emphasized in Chinese culture. Even though students’ cultural acquisition of academic excellence is a significant motivator contributing to their obtaining higher academic achievement in this study, the measurement of “academic excellence” used in this study is different from what the majority of Taiwanese people might think of academic excellence culturally. In Taiwan’s culture, the measurement of academic excellence for middle school students is often referred as “the once-for-all results of High School Entrance Exams”, while this study uses Comprehensive Analytical Ability Test designed by Academia Sinica researchers. Therefore, when considering the relationship between how children’s cultural acquisition of academic excellence contributes to their higher academic
achievement, school leaders should think through various views and provide more detailed arguments of academic excellence for students to consider.

**Limitations of the Study**

This study is limited to particular group of middle school students in Taiwan. Also, due to a) the sensitivity of revealing personal immigration status, b) the complexity of Taiwan’s immigration system, and c) TEPS being a student-centered survey, this study is limited to direct information available regarding mother’s immigration status in TEPS database. Many TEPS researchers also argued that the complexity of Taiwan’s immigration system made the survey questions related to new immigrant mother’s immigrant status extremely difficult to design (Cheng, 2105; Lin, 2006). Additionally, as TEPS is for the most part designed for student assessment, survey questions related to student’s family or school practitioners are considered as the secondary survey with less information available. As the results, it requires much investigation and screening to determine the criteria of mother’s immigration status as an inferential variable in this study.

Also, this study is limited to the bias of the demographic distribution of the sample. That is, the majority of the sample in this study is mainland Chinese mothers who live in urban areas of Taiwan. Since previous studies showed that there is a significant difference between mainland Chinese immigrant mothers, and new immigrant mothers from Southeast Asia, the results of this study contain certain bias because of a large number of mainland Chinese mothers in the sample (Chiu et al, 2008; Huang & Tang 2007). Similarly, previous research study indicated that there is a significant difference between urban and rural school districts rereading educational resources, students’ academic performance, and etc. (Chen, 2011; Lin, 2013). Therefore, the results of this study contain certain bias because the majority of the sample live in the urban areas of Taiwan.
As discussed above, this study is limited to the validity of TEPS’s measurements of achievement outcomes, which is less considered in the current literature. The majority of current literature regarding middle school students’ academic achievement is still based on the results of High School Entrance Exams, or self-designed measurements by researchers for specific case studies. Therefore, as this study used TEPS measurement of academic achievement outcomes, it is also subjected to its validity.

Also, due to the limited current literature regarding the impact of mother’s immigration status on children’s academic achievement in the context of Taiwan and other Asian countries, this study is limited to the conceptual frameworks available in the current literature. As Huang and Tang’s (2007) model was originally designed to assess the impact of mother’s low educational attainment on children’s academic achievement, their model is only appropriate for this study because most new immigrant mothers in Taiwan also have lower educational attainment. Huang and Tang’s (2007) model is thus limited to assess the academic achievement of children who have low-educated new immigrant mothers, but not new immigrant mothers who have higher educational attainments.

**Recommendations for future research:**

As previous research studies showed a greater and more direct impact of mother’s immigration status and low educational attainment on early childhood education (Lin, 2013; Tsai et al, 2011; Van Schaik & Burkart, 2011), further research should pay closer attention to how mother’s low educational attainment and immigration status may affect kindergarten or elementary school students’ academic outcomes in Taiwan’s context. Also, though much research has been done examining the relationship between mother’s low educational attainments and children’s academic achievement in Taiwan, little was done investigating the
relationship between all three factors: new immigration mother’s immigration status, their low educational attainment, and their children’s academic achievement (Chen & Yu, 2005; Huang & Tang, 2007). Thus, researchers could attempt to clarify and identify factors contributing to how the exact change of mother’s immigration status, (i.e. change of status, change of citizenships, or change of residency) may affect their children’s academic achievement, or how the exact change of mother’s immigration status interact with other identified factors contributing to children’s academic achievement.

Due to the bias of the sample in this study, future research could distinguish the difference between mainland Chinese mothers and new immigrant mothers from Southeast Asia in data screening and analyses, and examines if new immigrant mothers’ different countries of origin play a significant role in their children’s academic achievement. Future study could also attempt to investigate if residency areas of new immigrant mothers’ make significant difference in their children’s academic achievement.

In addition, given the little information available regarding mother’s immigration status and the complexity of Taiwan immigration system, researchers should focus on designing robust survey questions that will clearly identify one’s immigration status. As discussed previously, mother’s immigration status is a sensitive and complicated issue that the majority of new immigrant mothers in Taiwan are hesitant to answer or have little information to reveal the accurate details (Wu, 2009). However, in order to have better assessment of how immigration policy affects the academic achievement of children who have new immigrant mothers, policy makers and researchers must have more accurate information regarding mother’s immigration status. Thus, a better design of obtaining details of new immigrant’s immigration status might help increasing our knowledge to improve their children’s academic achievement.
In terms of the measurement of academic achievement, researchers should consider examining the relationships between TEPS results, the results of students’ High School Entrance Exams, or the measurements of many previous case studies in the literature. The emphasis of the national Entrance Exams for high schools and colleges in Taiwan’s educational system often overshadows other measurements of students’ academic achievement. Given the TEPS is one of the few retrospective longitudinal databases conducted by Academia Sinica of Taiwan, further research should pay closer attention to its validity and also examine the its relationships with other measurements of students achievement.

Additionally, it is important to design research frameworks that examine the relationship between immigration-related issues and the academic achievement of children who were born to new immigrant mothers in Asian or pan-Chinese culture context. The majority of current literature regarding the issue of parents’ immigration status are done in the US or European context. As some Asian countries, such as Taiwan and South Korea, are facing the increasing needs of children who were born to new immigrant mothers, further research should analyze the issue from certain contexts for more accurate assessment.

Given the increasing number of children who have new immigrant mothers in Taiwan’s local schools, it is also critical to evaluate how school leaders and practitioners’ knowledge and attitudes regarding immigration-related issues affect the school life or academic achievement of children of new immigrant mothers. Further research should examine if school leaders and practitioners’ understanding of immigration policy improve school’s cultural and educational diversity that may negatively or positive impact the academic achievement of children of new immigrant mothers in Taiwan’s context.

Summary and Conclusion
The demographic composition of low-educated mothers in Taiwan has changed drastically because of the increasing number of low-educated foreign-born mothers immigrating to Taiwan from mainland China, Vietnam, Indonesia, and Thailand in recent years. Currently, children of low-educated new immigrant mothers are consisted of nearly thirteen percent of middle school population in Taiwan. The purpose of this quantitative inferential study was then to explore the degree to which low-educated new immigrant mother’s immigration status, and other four identified factors related to mother’s low educational attainment, affect middle school students academic achievement in Taiwan. The interactive effects between mother’s immigrant status and these four identified factors, including children’s language acquisition, children’s adaption in school, children’s interpersonal skills, and children’s cultural acquisition, are also investigated in this study.

The database used in this study was a retrospective repeated-measures observational study of Taiwan Educational Panel Survey (TEPS) conducted and sponsored by Taiwan’s Academic Sinica and Taiwan’s Ministry of Education. Based on the findings of Huang and Tang’s (2007) regarding four identified factors related to mother’s low educational attainment that affect children’s academic achievement, I added mother’s immigration status as the first-order variable in Huang and Tang’s (2007) model. This study is then based on this five-factor model, which includes mother’s immigration status, children’s language proficiency, adaption to school, interpersonal skills and cultural acquisition, and examines how these factors affect middle school students’ academic achievement. Due to the nature of the independent and all predictor variables being categorical, and are under the assumption of natural ordering, I used the stepwise ordinal logistic regression to determine the likelihood of students obtaining higher or
excellent academic achievement, for a one-unit increase in each predictor variable. Also, the interactive effects of beta exponential functions were also included in the study.

Similar to the previous research, the findings in this study showed that: a) Middle school students having new immigrant mothers, particularly those who come from mainland China living in urban areas of Taiwan, b) middle school students who have better interpersonal skills, and c) middle school students who have better cultural acquisition, are more likely to obtain higher or excellent academic achievement levels. It also showed in this study that for middle school students who have new immigrant mothers, if they also have better interpersonal skills, the likelihood increases for them to obtain higher or excellent academic achievement level. In addition, for middle school students who have better interpersonal skills, if they also have better cultural acquisition, the likelihood increases for them to obtain higher or excellent academic achievement level. On the contrary, for student whose mothers are new immigrant mothers, if they have better cultural acquisition, the likelihood decreases for them to obtain higher or excellent academic achievement level.

With the results of this study, school leaders and practitioners should make efforts to create a welcoming school environment and pursue diversity for all students from different family, race and cultural backgrounds. It is also critically to avoid any negative tagging of students who have new immigrant mothers. Also, school leaders and practitioner should assure an interactive school environment that encourages meaningful friendships and engagement among students from diverse cultural backgrounds, and assists to improve students’ interpersonal skills and friendships. In term of enhancing students’ cultural acquisition of academic excellence, school leaders and practitioners should also offer a holistic and balanced view of how Chinese culture of academic excellent becomes a motivator for students obtaining higher academic
achievement, but at the same time would not overly emphasized it. More importantly, school
leaders and practitioners should realize their positive influences in Taiwan’s society that highly
values school leaders and practitioners, and actively take their important roles in Taiwan’s
educational and immigration reforms in a near future.
References


Ministry of Immigration:


Ministry of Immigration:


Taiwan Educational Panel Survey (TEPS): Center for Survey Research Data Archive


Taiwan Ministry of Education: Education in Taiwan. Retrieved from:

Taiwan Ministry of Immigration Census Center Digital Archive:
http://sowf.moi.gov.tw/19/quarterly/data/114/05.htm

Taiwan Ministry of the Interior Laws and Regulations:

Taiwan Ministry of Interior Policy and Incentives for New Immigrant Mothers. Retrieved from:
http://social.tncg.gov.tw/doc/woman/990622004.ptf


Tsai, S.-L. (2006). The research trend analysis for the East-southern spouse in Taiwan during the past decade—taking the nationwide theses as the examples. Unpublished master’s thesis, National Cheng-Kung University, Tainan City, Taiwan


doi: 10.1080/13621020701794224


Wu, S. (2004). 東南亞外籍女性配偶對於發展遲緩子女的教養環與主體經驗 初探—從生態系統觀點及相關研究分析 [An explorative study of Southeast Asian women’s parenting...
experiences of children with developmental delay]. *Community Development Quarterly* (in Chinese), 105, 159-175.


Appendix A: The Contents of the Questionnaires

<table>
<thead>
<tr>
<th>Students</th>
<th>Parents</th>
<th>Teachers</th>
<th>Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. My Life</td>
<td>I. Your Family</td>
<td>I. Questions to be Jointly answered by Teachers</td>
<td>I. Questions to be Answered by the Principal</td>
</tr>
<tr>
<td>1. A typical day at school</td>
<td>1. Personal details of household head (gender, marital status, education, state of health, etc.)</td>
<td>1. Position held in the school</td>
<td>1. Principal’s personal details</td>
</tr>
<tr>
<td>2. The learning experience in class</td>
<td>2. Linguistic skill of household head</td>
<td>2. Educational experience</td>
<td>2. Basic data of the school</td>
</tr>
<tr>
<td>II. My Home</td>
<td>3. Place of birth of household head</td>
<td>3. Teaching status</td>
<td>3. Relations between school administration and teachers association</td>
</tr>
<tr>
<td>1. Family members</td>
<td>4. Learning ability of household head</td>
<td>4. Attitude taken by students’ parents</td>
<td>4. Students’ family background</td>
</tr>
<tr>
<td>2. Major home events</td>
<td>5. Household financial status and learning resources</td>
<td>5. Academic atmosphere within the school</td>
<td>5. Awards system</td>
</tr>
<tr>
<td>4. Parents’ participation degree in school and learning activities</td>
<td>1. Child learning ability</td>
<td>7. School organization and administration</td>
<td>II. Questions to be Answered by the Director of Academic Affairs</td>
</tr>
<tr>
<td>5. Interaction with siblings</td>
<td>2. Child learning attitude</td>
<td>8. Teaching resources</td>
<td>1. Director’s personal details</td>
</tr>
<tr>
<td>III. School Life</td>
<td>4. Child health</td>
<td>II. Questions to be Answered by the Homeroom Teacher</td>
<td>3. School entrance methods and teaching approach</td>
</tr>
<tr>
<td>3. Interaction with classmates and teachers</td>
<td>III. Your Child during Primary School and Junior High School</td>
<td>3. Interaction with parents</td>
<td>6. How the school operates in practice</td>
</tr>
<tr>
<td>4. The student’s life at school</td>
<td>1. Interaction with parents</td>
<td>4. Incentives and punishments used</td>
<td>II. Student Affairs</td>
</tr>
<tr>
<td>IV. Leisure and Entertainment</td>
<td>2. Common conflicts and the solutions adopted</td>
<td>5. Appraisal of student’s overall performance</td>
<td>1. Details of classes taught</td>
</tr>
<tr>
<td>1. Extracurricular activities</td>
<td>3. Consensus of your spouse at disciplinary attitude</td>
<td>III. Questions to be Answered by Core Subject Teachers</td>
<td></td>
</tr>
<tr>
<td>2. Experience in school societies and leadership</td>
<td>4. Interaction with the parents of the child’s classmates</td>
<td>1. Details of classes taught</td>
<td></td>
</tr>
<tr>
<td>3. Experience in societies outside school and leadership</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Participation in talent and cultural activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Part-time work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Friends</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V. About Me</td>
<td>IV. Relationship Between Family and the Child’s Current School</td>
<td>V. Expectations for the Child</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------------------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>1. Personal details (age, gender, height, weight, eyesight, learning status in junior high school, etc.)</td>
<td>1. Interaction with the school</td>
<td>1. Parents’ sacrifices for the sake of the child education</td>
<td></td>
</tr>
<tr>
<td>2. Educational choices</td>
<td>2. Understanding of the school</td>
<td>2. Expectations relating to the child’s educational achievement</td>
<td></td>
</tr>
<tr>
<td>3. Personal educational goals and expectations</td>
<td>3. School-related expenditure</td>
<td>3. Comparison of the child’s educational achievement with others</td>
<td></td>
</tr>
<tr>
<td>5. Reasons for discomfort</td>
<td>5. Classroom atmosphere</td>
<td>5. Parental employment status</td>
<td></td>
</tr>
<tr>
<td>6. Physical and psychological perplexity (such as the issue that affect concentration)</td>
<td>6. Appraisal of academic performance</td>
<td>6. Progression status to higher levels of education</td>
<td></td>
</tr>
<tr>
<td>7. Learning attitude</td>
<td>7. Appraisal of student performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Personality</td>
<td>8. Types of consultation room</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Self-appraisal of own abilities level of happiness</td>
<td>9. Types of psychological testing used and action taken based on test results</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IV. School Funding and Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Appraisal of teaching equipment</td>
</tr>
<tr>
<td>2. Teaching-related expenditure</td>
</tr>
<tr>
<td>3. School budget</td>
</tr>
<tr>
<td>4. External contributions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V. Personnel Matters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching staff</td>
</tr>
<tr>
<td>2. Teacher seniority</td>
</tr>
<tr>
<td>3. Teacher education</td>
</tr>
</tbody>
</table>
Appendix B TEPS Student Survey Questions

Identification

- Stud_id—student ID
- W1priv—private schools
- W1urban—urban and rural

Part 1 My Life

- W1s101—when do you usually wake up in the morning?
- W1s102—what time do you usually leave for school?
- W1s103—what do you usually do before the first class in school?
- W1s104—what do you usually do during naptime?
- W1s105—what time do you usually leave school for home?
- W1s106: if you stay after school, what are the reasons?
- W1s10: on average, how long do you stay in school everyday?
- W1s108: how much time do you spend on school work, extracurricular activities, school counseling, cram schools or tutoring every week?
- W1s109: when do you usually go to bed during the semester?
- W1s110: In addition to going to cram schools and tutoring, how much time do you spend on homework, studying and tests?
- W1s111—in general, what is the school subject do you spend the most of time working on every week?
- W1s112—how much time do you exactly spend on this subject?

W1—during the past summer vacation, did you spend any time on any of the followings:
- W1s1131—crams schools and extracurricular activities.
- W1s1132—oversea summer camps or language schools.
- W1s1133—Special summer camps (e.g. Science camp, Computer camps, or etc.)
- W1s1134—Special or language courses
- W1s1135—work-study or part-time jobs
- W1s1136—None of above

W1—during the past summer vacation, did you spend any time on any of the followings:
- W1s1141—Versatile classes (e.g. guitar, drawing, dancing)
- W1s1142—sports classes (e.g. Judo, swimming, scouts)
- W1s1143—community service
- W1s1144—readings (extracurricular books)
- W1s1145—Surfing internet or playing video games (more than two hours)
- W1s1146—None of above
- W1s115—How many days did you ask for leave in this semester so far?
- W1s116—have you skipped any classes this semester so far?
- W1s117—have you been late for schools this semester so far?
• W1s118 (for high school students)—have you taken any electives in your freshman year?

Part 2 My Family

• W1s201—where do you live this semester?

W1: who do you live with in your family?
• W1s2021—father
• W1s2022—mother
• W1s2023—step-parents
• W1s2024—grandparents
• W1s2025—siblings
• W1s2026—others
• W1s203—how many older brothers do you have?
• W1s204—how many younger brothers do you have?
• W1s205—how many older sisters do you have?
• W1s206—how many younger sisters do you have?
• W1s207—how many of your siblings are younger than 18?

W1: have any of the followings happened in your family? When?
• W1s208—Divorce or separation of parents
• W1s209—Passing of parents
• W1s210—Serious health issues of parents.
• W1s211—Parents having mental illness
• W1s212—Parent having habit of excessive alcohol drinking
• W1s213—Family economic issues
• W1s214—did your family member pass away or hurt in 921 Earthquake?
• W1s215—how long did it take to bring your family back to normal live after the 921 Earthquake?
• W1s216—since when did you family members start to teach you the homework?
• W1s217 since when were your family members not able to teach you the homework?
• W1s218—what are the reasons your family members do not teach you the homework?
• W1s219—does your father talk to you about schoolwork or your future career?
• W1s220—does your father listen to you talking about your secrets?
• W1s221—does your father look into your tests, or try to understand your learning progress?
• W1s222—does your father participate your school activity or volunteer in parents committee?
• W1s223—does your mother talk to you about schoolwork or your future career?
• W1s224—does your mother listen to you talking about your secrets?
• W1s225—does your mother look into your tests, or try to understand your learning progress?
• W1s226—does your mother participate your school activities or volunteer in parents committee?
• W1s227—do you argue with your father or not to talk to him?

What are the reason you fight or not talk to your father?
• W1s2281—we do not have argument at all.
• W1s2282—academic performance
• W1s2283—friends
• W1s2284—schedule
• W1s2285—money
• W1s2286—my behaviors
• W1s2289—how do you resolve the conflicts with your father?
• W1s230—my father loves me and accepts me.
• W1s231—my father discipline me rigidly.
• W1s232—do your interactions with your father change since you are in middle school?
• W1s233—do you argue with your mother or not to talk to her?

What are the reasons you fight or not talk to your mother?
• W1s2341—we do not have argument at all.
• W1s2342—academic performance
• W1s2343—friends
• W1s2344—schedule
• W1s2345—money
• W1s2346—my behaviors
• W1s235—how do you resolve the conflicts with your mother?
• W1s236—my mother loves me and accepts me.
• W1s237—my mother disciplines me rigidly.
• W1s238—do your interactions with your mother change since you are in middle school?
• W1s239—do your parent bring you along to visit friends and relatives?
• W1s240—do you often have friends or relatives visit your home?
• W1s241: when I do something wrong, my parents always…
• W1s242: when I do something great, my parents always…
• W1s243—does it bother you when your parent argue over issues regarding how to discipline you?
• W1s244—do it bother you when parents favor your siblings over you?

W1: you interaction with your siblings:
• W1s245—we argue and do not talk each other.
• W1s246—we share our secrets
• W1s247—we play sports and go shopping together.
• W1s248—they know my schedule, my behaviors and my friends.
• W1s249—we accept each other
• W1s250—the performances of my sibling give me pressure

W1 mark true or false: relationship in my family
• W1s251—clear traditional Chinese family hierarchy: to respect the elders and honor those who are above you.
• W1s252—favor male children over female children
• W1s253—my family is a great support of my life
• W1s254—we make important decisions together
• W1s255—how long are you usually at home alone after school before any adult family members come home?
• W1s256—if you do not live at home, how often do you go home?

Part 3: School Live: do you think your school is a place of…
• W1s301—happiness
• W1s302—friends
• W1s303—Boring place
• W1s304—learning a lot stuff
• W1s305—strict school rules
• W1s306—unfairness where the awarding or punishment system is bad
• W1s307—unsafe campus
• W1s308—not caring for students
• W1s309—students do not study
W1—does the followings occur in your school often?
• W1s310—student’s skipping class
• W1s311—student’s fighting and arguing with teachers
• W1s312—student’s watching pornographic books, videos or websites
• W1s313: student’s smoking, drinking and eating “Bing Lang”
• W1s314—student’s stealing or breaking other’s stuff

W1—does it happen in your class?
• W1s315—better academic performance than other classes
• W1s316—classmate often discuss homework or study together
• W1s317—big competition on grades among classmates
• W1s318—classmates talking about where to go to school in the future.
• W1s319—classmate often go to speeches or shows together.
• W1s320—classmate go to see teachers and chit chat
• W1s321—classmate’s family and economic ground is fairly good.

W1: interactions between students and teachers:
• W1s322—teachers are able to recognize every student in the class
• W1s323—teachers blame or punish students often
• W1s324—teachers encourage students when they study hard
• W1s325—teachers do not care even when students cannot focus or catch up in class
• W1s326—teachers spend a lot of time quieting down students and talking topics that are not related to the curriculum
• W1s327—teachers using various methods to help us understand the curriculum
• W1s328—teachers give us a lot of homework for practice
• W1s329—teachers will definitely follow up on if students do not hand in homework or do it bad
• W1s330—teachers talk about the exams questions afterwards.

W1: do teachers show favors to…over others?
• W1s3311—male students
• W1s3312—female students
• W1s3313—student with good grades
• W1s3314—students with bright characters
• W1s3315—students who pay much attention in class
• W1s3316—teachers do not show any favoritism

W1 have any of the following incidents happen to you?
• W1s332—someone stole my stuff
• W1s333—someone attempted to sell me illegal drugs
• W1s334—someone threatened me
• W1s335—someone used force to threat or seize my stuff
• W1s336—someone sexually harassed or abused me
• W1s337—I was called to the student’s discipline office due to behavior issues.
• W1s338—I was called to the teacher’s office because of poor academic performances
• W1s339—my family member was notified because of my behavior issues
• W1s340—my family was notified because I skipped class

W1 what type of person do you think you are?
• W1s341—a popular person
• W1s342—a good athlete
• W1s343—a student who teachers like
• W1s344—a famous person in school

Part 4 Extracurricular activities
• W1s401—I represented my schools for competitions
• W1s402—I represented my schools in choir athlete or music band activities.
• W1s403—how much time do you spend practicing for athletic competition?

W1 Are you now participating on any of the following clubs?
• W1s404—student organizations
• W1s405—Community services
• W1s406—Sports clubs
• W1s407—Academic clubs
• W1s408—Art clubs
• W1s409—How much time do you spend on club activities every week?
• W1s410—does your school have any academic requirement for joining the sports team?
• W1s411—have you been one of the class leaders?
• W1s412 have you participated in any clubs outside the school?
• W1s413—how much time do you spend on these club activities?
• W1s414—have you been any club leaders?

W1 have you participated in any of the following activities?
  • W1s415—Gone to any music concerts.
  • W1s416—Listened to the classic music and or gone to any art performance.
  • W1s417—Gone to museums or any exhibitions.
  • W1s418—Gone to technology or computer exhibitions
  • W1s419—Gone to bookstores or library
  • W1s420—Volunteered in community services
  • W1s421: Do you play any instruments?

W1 What is the reasons using computer?
  • W1s4261—Never used computer
  • W1s4262—Emails, online chat or online bulletin board
  • W1s4263—Doing homework, searching information or newsletters.
  • W1s4264—Playing video games, listening to music or watching VCD
  • W1s4265—Others
  • W1s427—How much time do you spend on using computer?
VITA (CHAO JUI HUANG)

EDUCATION
2011-2018 Pennsylvania State University, University Park, PA
Doctoral of Philosophy in Educational Leadership
Academic concentrations: Educational Collaborative Leadership and Statistics

2008-2010 Pennsylvania State University, University Park, PA
Master of Art in Political Science (International Affairs)
Academic concentrations: Comparative Politics and Methodology

EXPERIENCES WORKING WITH UNDERGRADUATE STUDENTS
2011-2017 Coordinator of College Student Ministry, State College Chinese Alliance Church, State College, PA
- Provides on-site supervision to the weekly Bible study group leaders and offer ongoing constructive feedback and guidance to assist the leaders in creating a collaborative learning environment.
- Creates and develops resources that pertain to collaborative learning, student engagement, study skills, problem-solving and other Bible-study tools for students leaders.
- Conducts, reviews, and helps to update or redesign weekly training and facilitation materials and resources to student leaders.

2011-2015 IT Services Consultant/Graduate assistant, Information Science and Technology Services, Pennsylvania State University, University Park, PA
- Conducts research and constructs surveys questionnaires and assessments regarding customer’s stratification with the Penn State IT Services.
- Provides consultations to all Penn State students, staff and faculty members on any IT Services through phone calls and email correspondences.
- Assists the managers with IT trainings, open-house events conference planning and day-to-day office operations.

OTHER PROFESSIONAL EXPERIENCES
February 2011- July 2011 International Center for Language Studies, Washington, DC
Program assistant
- Performed daily logistic duties, including phone answering and email communications.
- Arranged various curriculums teaching schedule and maintained the Center’s library.
- Delivered one-on-one Chinese language trainings to the US military and government personnel.

August 2010 - February 2011 American Enterprise Institute for Public Policy Research, Washington, DC
Research assistant
- Conducted extensive literature reviews and translations for Taiwan’s economy project, a series of economic and sustainability studies on China, Taiwan and the Asian Tigers’ future economic edges
- Assisted the projects on China’s navy and air force capacity, Taiwan’s military overview, and the China-Japan disputes with intensive daily news monitoring, research and literature reviews and translations.