

**Small Frog in a Big Pond vs. Big Frog in a Small Pond:  
Comparing Actual and Perceived Math Achievement Gaps  
among Korean, Korean-American Immigrant and Korean-American Native Students**

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### Abstract

This study examines the pattern and extent of actual vs. perceived math achievement gaps (test scores vs. self-ratings) among Koreans, Korean-American immigrants and Korean-American natives. The study links TIMSS 2007 8th grade math data and ECLS-K 2007 8th grade math data together for matched sample (Korean ethnicity) comparisons. In terms of actual achievement as measured by test scores, Korean students perform significantly better than Korean-American students who in turn perform better than other American students. In contrast, in terms of perceived achievement as measured by self-ratings, Korean students have significantly lower self-concept than both Korean-American and other American students. The findings imply that Korean students are akin to “a small frog in a big pond”, whereas Korean-American students are more like “a big frog in a small pond.” This study gives new insights into multi-faceted, transnational achievement gaps between student groups with common ethnic background but different frames of reference and academic standards.

*Keywords:* achievement gap, math achievement, Korean-American

On one hand, the U.S. faces significant challenges of tackling enormous academic achievement gaps among different racial and ethnic subgroups of students within the nation (Lee, 2002). The task of narrowing this racial gap is complicated by growing immigrant student populations who bring cultural and linguistic differences to schooling. On the other hand, the U.S. also faces another daunting challenge of addressing large achievement gap relative to other developed countries (Baker, 2003). The gap between the average U.S. student and the average student from the highest-performing Asian countries (e.g., Korea) in math is as large as or sometimes even larger than the within-country achievement gap among racial groups such as Black-White achievement gap. The domestic racial achievement gaps including immigrant vs. non-immigrant gaps may be examined in a larger international context, and in this paper we focus on the comparison of immigrant and native Korean-American students relative to native Korean students as well as other American students.

The paradox of Korean education is that students are performing well on tests but feeling bad about their performance (Lee, 2016).<sup>1</sup> According to Trends in International Mathematics and Science Study (TIMSS) 8<sup>th</sup> grade math test results, Korean students perform at the top, while American students perform below the international average. The actual level of students' math performance measured by test scores is sharply contrasted with perceived level of math achievement reported by students; Korean students tend to report the lowest level of self-concept of mathematics achievement among all the TIMSS countries, while American students are placed in the top ranks. While U.S. President Obama often mentioned the Korean education system as a model of educational success for American schools and children in terms of academic achievement, those praises came as a surprise to many South Koreans at that time as the country's education system has been under constant public criticisms such as excessive

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<sup>1</sup> Similar tendency was found among other high-performing East Asian nations. Asian students outperform American students, but they tend to have lower self-concepts of ability (Stigler, Smith, & Mao, 1985; Whang & Hancock, 1994).

academic competition and stress among students (The Korea Times, 2010).

A similar kind of paradox may happen to Asian-American students who tend to outperform other racial groups in schools but experience academic pressure and stress as a model minority group. Asian-American students report the most challenging trouble threshold for school grades and the greatest fear of the consequences of not doing well in schools (Steinberg, 1996).<sup>2</sup> However, there can be significant “washaway” of Asian sociocultural influences among Asian-American immigrant students of the third generation and plus (Sue & Okazaki, 1990; Wang & Lin, 2005). Asian-American native students are more likely to experience the “big frog in a small pond” phenomenon; these students manage to maintain only a slight edge over any other racial group including White students within the U.S. and thus may feel an inflated sense of achievement. In fact, Asian-American students substantially lag behind international competitors including native Asian students with the same ethnic background outside of the U.S.

How do cultural and institutional differences between Korean and American education systems affect contradictory patterns of achievement gaps as measured by students’ self-concept ratings vs. test scores? While the between-country gaps have been studied and known better, the question remains as to how the paradox of achievement result-perception gap plays out among Korean-American students in the United States. Korean-American students are more likely to become overachievers through higher academic expectations. At the same time, Korean-Americans are still relatively immune from academic pressure at both home and school, compared to their counterparts in Korea where academic competition for college entrance is much more intense. This study examines the pattern and extent of math achievement gaps (both test scores and perceptions) among Koreans, Korean-American

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<sup>2</sup> Steinberg (1996) found racial variation among in terms of the lowest grade that students think that they could receive without their parents getting angry. The school grade trouble threshold was C- for Blacks and Hispanics, B- for Whites, and A- for Asians.

Immigrants, and Korean-American Natives.

### Research Frameworks and Perspectives

This international comparative study intends to further theoretical knowledge of achievement gaps in its examination of U.S. domestic and international achievement gaps measured in students' test scores and perceptions and of the dynamic influences on the comparative achievement gaps. In this study, achievement gaps--conventionally understood as "[p]ersistent differences in achievement among different groups of students as indicated by scores on standardized tests, grades, levels of educational attainment, graduation rates, and other data" (Ravitch, 2007, p. 9)—are not defined merely as the binary group differences between the dominant reference group and the rest, traditionally, White students and minorities--Black, Hispanic, or Asian American--in the United States (Lee, 2002, 2016). Addressing the need to expand the traditional, singular definition (Carpenter, Ramirez, & Severn, 2006) and also to shed insights on the existing relationship between cultural community practices and individuals' repertoires of cultural practice (Gutiérrez & Rogoff, 2003), this study assumes and further examines the plurality of within- and between-group differences among multiple student populations. Understanding the achievement gaps phenomenon should include considerations of the complexity of dynamic cultural-historical and educational environments as well as racial and ethnic cultural heritage and immigration generation status.

The *achievement gaps* problems are, thus, newly and operationally defined as “*any measured difference between how children learn and grow (actual learning growth) and how children could learn and grow under ideal circumstances (desired learning growth).*” (Lee, 2016, p. 15, emphasis in italics original) In regards to the new definition above, Lee's dynamic, multi-componential model (2016) of Balanced Achievement Gap Management

System (BAGMS hereafter) offers an explanatory lens with which to reframe the notion of achievement gaps and to further the understanding of the dynamicity of the phenomenon influenced by an increasing number of identified and potential factors on the achievement gaps trends. According to the BAGMS model, achievement gaps result from the discrepancy between desired achievement goals--in other words, *Desired Achievement Level* (DAL)--and current achievement status--*Actual Achievement Level* (AAL). DAL can be oriented by standards and/or norms set for the target student (sub)population in a particular education system and, additionally, by subgroup-specific needs related to situated environmental conditions and individual students' learning growth potential. Students' socially constructed background characteristics such as race and ethnicity, socioeconomic status, and nationality influence both DAL and AAL and resulting achievement gaps (see Figure 1; Lee, 2016 for a comprehensive introduction of the BAGMS model). The achievement gaps are likely to affect student attitude and disposition including *Perceived Achievement Level* (PAL). A manageable level of "positive" achievement gaps ( $DAL > AAL$ ) is healthy and can be conducive to achievement gain by bringing more learning opportunities and engagement efforts. However, excessively large gaps (as a result of unrealistic achievement goals) can be harmful by depressing academic self-efficacy and improvement. At the same time, too much "negative" gaps as a result of artificially lower expectations and overpraise may lead to an illusion of proficiency and can be detrimental to potential growth.

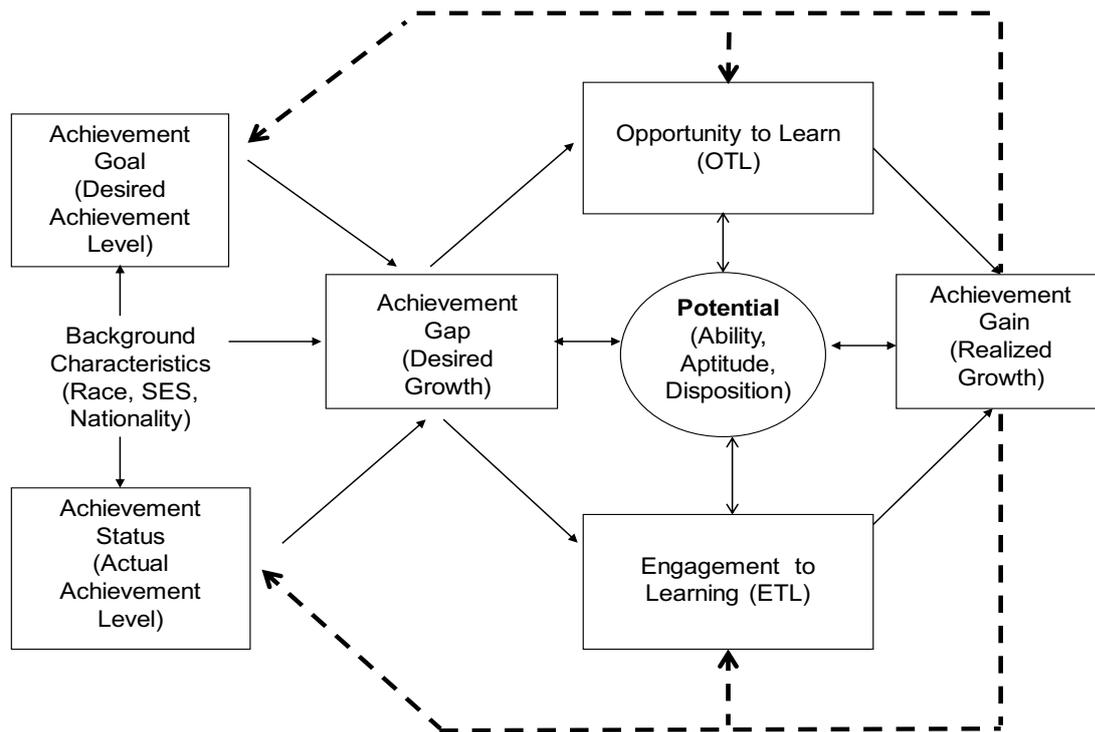


Figure 1  
Model of Balanced Achievement Gap Management System (BAGMS)

Additional theoretical constructs that aid in delving into the BAGMS components of interconnected influence and, thus, guide the interpretation of measured achievement gaps in test scores and perceptions by Koreans, Korean-American Immigrants, and Korean-American Natives concern differences in terms of sociocultural ecologies of standards and expectations and frames of comparative reference, to be discussed in turn.

First, culture, often viewed as the significant influence on Asian immigrant students' high academic achievement, is not without debates on its nature. Culture is not framed, in this study, as an inherent, unvarying endowment to all individuals with the common cultural origin or heritage (Fukuyama, 1993), which may not only neglect within-group differences and but also dangerously lead to perpetuating the 'model minority' myth (Lee, 2009). Similar reasoning against stereotyping applies to refute the myth of the 'culture of poverty' (Lewis,

2011) that tends to wrongfully position the culture of lower socioeconomic cultural groups as deficient thus resulting in stereotyped minority--Black or Hispanic--students' underachievement (Gorski, 2008), compared to higher achieving Asian American or White peers.

Rather, the role of culture is conceptualized as a social 'structure' (Zhou & Kim, 2006) or a cultural-ecological 'environment' (Ogbu & Simons, 1998). On one hand, this notion supports and strengthens the traditional Confucianist and collectivist cultural value of education for the success of the group and the individual as an organic part within the cultural group (Gudykunst, 2004) and also fosters immigrants' heightened view of education as the effective means toward social mobility in the United States (Sue & Okazaki, 1990) in its culture-structural interaction through ethnic 'community forces' (Ogbu & Simons, 1998) or, in other words, cultural resources and developing 'social capital' (Bourdieu, 1986)—the aggregate of the actual or potential resources linked to membership in a group. Thus, culture as the socioecological structural drive may influence Korean American students' Desired Achievement Level in the sociocultural standards and expectations, Actual Achievement Level, thus, the achieving gaps (Lee, 2016) and also Perceived Achievement Level (introduced above).

Further, important variations among students with same ethnicity and cultural heritage—Koreans, Korean-American immigrants, and Korean-American natives in this study—may be understood in terms of, among other factors, the extent of their comparative participation in the cultural 'repertoires' of their origin or heritage (Gutiérrez & Rogoff, 2003) and the relative differences in their status frames of reference (Ogbu & Simons, 1998) that may account for the reversed pattern of the students' perceptions of their academic achievement.

Understanding Korean cultural ways, repertoires, or ‘styles’ of learning would help explain the pattern and extent of variations among Korean—native or immigrant— students’ achievement gaps lies in the comparative “proclivities of people with certain histories of engagement with specific cultural activities” (Gutiérrez & Rogoff, 2003, p. 19), or in other words, families and communities’—not merely the students’—experience participating in cultural practice, in particular, toward academic achievement in the interest of this study. For example, the levels of parental involvement (Kim, 2002) as learners’ social capital and educative community environment (Zhou & Kim, 2006) as students’ educational ecology contribute importantly to the observed phenomenon with Korean-American immigrant and Korean-American native high achievers in the United States.

In addition, a stronger manifestation of educative ecology with much heightened levels of engagement in achievement-oriented ways of learning is noted with the values, standards, expectations, goals, and behaviors/practices of individuals, families, formal schools, supplementary academic programs, and the broad-based society in Korea. The persistent phenomenon of ‘education fever’ in Korea is interdependent on the nation’s notable economic development, and the educational zeal continues to propel rigorous investment in education in societal and individual levels, which is fueled by and also leads to intense academic competition among students for high-stakes college entrance to gain social mobility and status and economic prosperity in the status-driven, competitive capitalist industrial environment (Seth, 2002). The sustainability of the nationwide—and possibly transnational depending on the comparative strength of Korean-American students’ participation in the Korean education fever repertoires (Gutiérrez & Rogoff, 2003)—cultural activities is systemically coordinated by the traditionally centralized educational system (Seth, 2002) that operates national standards, curricula, assessments, and teacher certifications.

To elaborate on the transnational nature of the Korean achievement orientation and investment, immigrants and their children may participate in such cultural repertoires, whether on the peripheries, in the new ecological center created in the new society, or in between. Varying degrees of the engagement and resulting achievement gaps and gains can be accounted for in part in terms of immigration generation status—third generation and plus Asian-American students’ experience of ‘washaway’ of Korean macro sociocultural influences (Wang & Lin, 2005)—and ‘voluntary’ minority group members’ comparative status frames of reference in the ecological continuum (Ogbu & Simons, 1998) of their overall identity work. The ways voluntary (immigrant) minorities view their dual worlds and behave in them include their perceptions of—for example, Perceived Achievement Level—and responses to education—including measurements in achievement test scores. The dynamic nature of the frames of reference defined as “the way a person views a situation” explains voluntary minorities’—not only the first generation—use of non-singular frame of reference, one based on their current situation in the new society, and the other rooted in their place of origin or heritage. In comparison with the ‘back home’ situation that the immigrants or their children may or may not have experienced firsthand, the minorities may take a positive view of the opportunities in the United States, which may lead to positive achievement gains whereas involuntary immigrants may show different, oppositional frames of reference (Ogbu & Simon). Taking within- and across-group heterogeneity of individuals’ conditions and experiences into consideration, this study importantly acknowledges the existence of disparate worlds—‘back’ home (Korea) and ‘new’ home and schools in the United States—with different cultural codes and discourses (Lew, 2006) and, extends Ogbu’s theoretical frames of reference to interpret possible paradoxical acts in achievement gaps.

Korean, American, and Korean-American students are likely to have different sociocultural frames of reference. One major source of frame of reference is school

curriculum and performance standards as well as teacher and parent expectations for students. TIMSS curriculum studies have showed that the U.S. curriculum is not only less focused, but also less advanced; the topics being taught in U.S. 8<sup>th</sup> grade math classrooms were taught at the 7<sup>th</sup> grade level in some high-performing countries such as Korea (Schmidt, McKnight, & Raizen, 1997). For average Korean students who are expectedly all college-bound and under severe competitive stress, their frame of reference is more likely to be national high-performing student group based on high-stakes college entrance tests and feedback from private tutors in their college-prep cram schools; their primary goal is getting admissions to top-tier selective colleges and universities (Kwon, Lee, & Shin, 2015). For average American students who are not always college-bound and under less competitive pressure, their frame of reference is more likely to be local norms in their own schools based on school grades and teacher feedback (Lee, Liu, Amo, & Wang, 2014). For Korean-American students in the U.S., their frame of reference is likely to be dual (e.g., primarily American and secondarily Korean or vice versa depending on their identity and generation status), and thus performance expectation is intermediate between the average Koreans and Americans. Asian-American parents' expectations for academic performance tend to be generally higher than those of other racial groups (Thernstrom & Thernstrom, 2003), but their gaps relative to ones back in home country are less well known and may vary by the origin of country and culture.

Frog-pond model has been usually studied in the organizational context of educational and occupational attainment, involving comparisons among high-performing students from high vs. low-performing schools. For example, college admissions studies weighed the importance of individual students' academic merit relative to their schools' average achievement for determining the chance of admissions to selective colleges. Previous studies found modest benefits of being positioned as a "big frog in a small pond" (i.e., high class rank) but at the same time there were counterbalancing effects of being regarded as a "small

frog in a big pond” (i.e., high prestige of school reputation) (see Attewell, 2001; Espenshade, Hale, & Chung, 2005; Marsh, Koller, & Baumert, 2001). However, there is dearth of research on frog-pond model in the larger sociocultural context of educational achievement through comparisons among high-performing ethnic groups from high vs. low-performing nations. This transnational comparison would give new insights into multi-faceted achievement gaps between Koreans, Korean-American immigrants and native students of the same ethnicity who have different frames of reference and standards for academic achievement.

### Methods

This study drew on subsamples from the 2007 Trends in International Mathematics and Science Study (TIMSS) that provides math assessment and survey data for grade 8 students, with focus on the two nations including the U.S. and Korea. This study also drew on subsamples from the Early Childhood Longitudinal Study-Kindergarten (ECLS-K) that provides math assessment and survey data for a nationally-representative U.S. sample of kindergartners from the fall of 1998 through 2007, with focus on Korean-American 8<sup>th</sup> grade students in 2007. ECLS-K 8<sup>th</sup> graders whose school-reported race was Asian and whose self-reported ethnic identity was Korean were classified into two groups: immigrants (the first and second generation students) and natives (the third generation and plus). This generation grouping was based on the birthplace of students and their mothers (or fathers in the absence of mothers): if both students and parents were born in the U.S., then they were treated as natives.

This study linked TIMSS 2007 8<sup>th</sup> grade math assessment/survey data and ECLS-K 2007 8<sup>th</sup> grade math assessment/survey data for comparing the 8<sup>th</sup> grade samples of Americans (N = 7,377 in TIMSS and N = 7,332 in ECLS-K), Koreans (N = 4,240 in TIMSS), and Korean-Americans (N = 19 in ECLS-K). For measuring “Actual” Achievement Level (AAL), test

score data were used. A linear linking (scale concordance) method was used to convert both TIMSS and ECLS-K math achievement test scores into National Assessment of Educational Progress (NAEP) scale, based on the assumptions of test and population comparability. There were commonalities between NAEP and TIMSS that enhance the validity of linking the scores. First, both NAEP and TIMSS were based on similar curricular frameworks; although the two assessments have no common items, content analyses of both assessments suggest that they are sufficiently similar to warrant linkage for global comparisons (National Center for Education Statistics, 2006). The same can be said of NAEP and ECLS-K. Using the U.S. average as common anchor point between TIMSS and ECLS-K datasets, the aforementioned math achievement test scores were compared among Koreans, Korean-American immigrants, and Korean-American natives; the gaps were measured in standard deviation units relative to average American students (common reference group).

For measuring “Perceived” Achievement Level (PAL), survey questionnaire data were used. The TIMSS survey question asked students to indicate the degree of agreement with a statement: “I usually do well in math.” The percentage of students who rated themselves as good performers in math (i.e., choosing the response “strongly agree” or “agree” as opposed to “strongly disagree” or “disagree” on a 4-point scale) has been calculated separately for the U.S. and Korean 8<sup>th</sup> grade student samples. Similarly, the ECLS-K survey asked students to indicate the degree of truthfulness about a statement: “I get good grades in math.” The percentage of students who rated themselves as good performers in math (i.e., choosing the response “very true” or “true” as opposed to “not at all true” or “a little bit true” on a 4-point scale) was calculated separately for the U.S overall sample and Korean-American immigrant and native 8<sup>th</sup> grade student subsamples. Although the questions were not identical between the two datasets, both tapped into students’ own perceptions of math achievement that would reflect their school grades and performance standards as set by school teachers. The survey

self-ratings of math achievement were compared among Koreans, Korean-American immigrants, and Korean-American natives; the gaps were measured in standard deviation units relative to average American students (common reference group).

Figure 2 illustrates how this study was designed to examine and compare actual vs. perceived achievement gaps between Korean, Korean-American, and American students. Given the hypothetical normal distributions of math achievement test scores for Korea (left-hand side bell curve) and U.S. (right-hand side bell curve) respectively, the average test score differences between Koreans (eighth-grade students in Korea) and Americans (eighth-grade students in the U.S.) are equivalent to the vertical distance between  $Y_k$  and  $Y_a$  points:  $Y_k - Y_a = \text{Korea-US math achievement test score gap}$ . This gap calculation is based on the TIMSS 2007 8<sup>th</sup> grade math assessment data for Korea vs. U.S. samples. In a similar vein, the average test score differences between Korean-American 8<sup>th</sup> grade students in the U.S. and all American 8<sup>th</sup>-grade students in the U.S. are calculated:  $Y_{ka-i} - Y_a = \text{Korean-American immigrant vs. average American math achievement test score gap}$ , and  $Y_{ka-n} - Y_a = \text{Korean-American native vs. average American math achievement test score gap}$ . This gap calculation is based on the ECLS-K 2007 8<sup>th</sup> grade math assessment data for Korean-American student subsamples (both immigrants and natives) relative to entire American student sample (reference group). Based on relevant theory and prior research, it is hypothesized that Actual Achievement Level in math (AALm) as measured by test scores follows this rank order: Koreans > Korean-American immigrants > Korean-American natives > Americans.

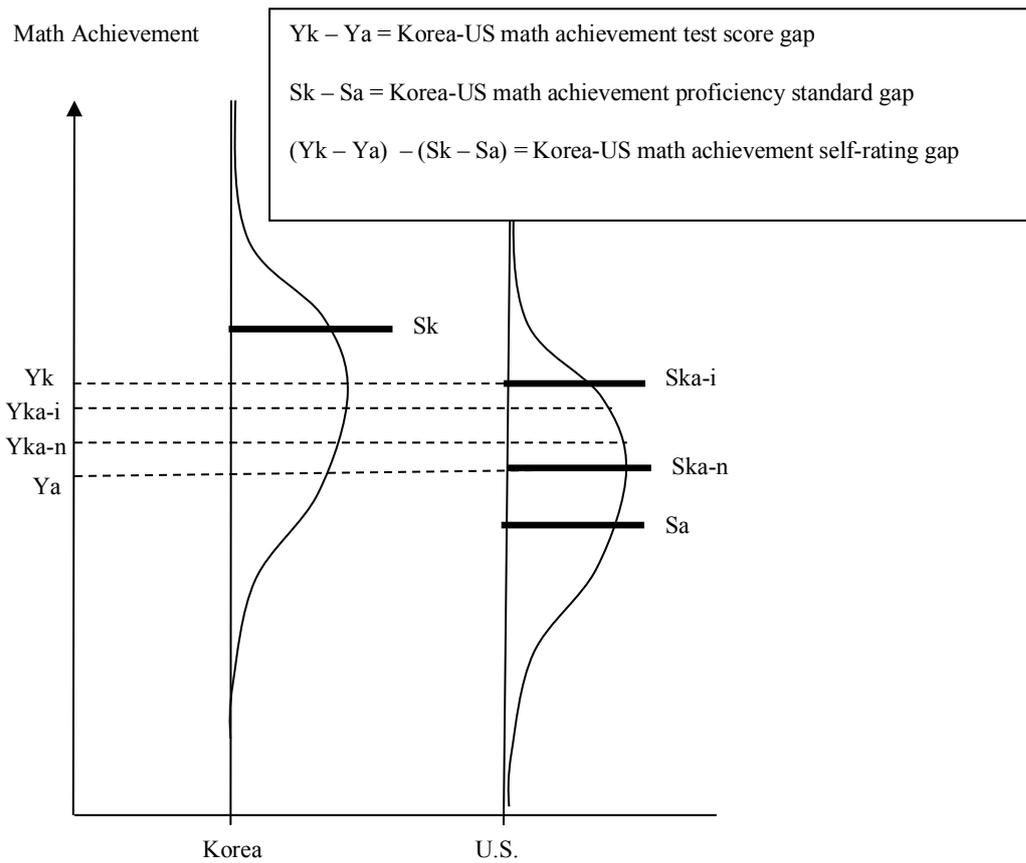


Figure 2  
Illustration of hypothetical Korea-US math achievement test score and proficiency standard distributions

Note.  
 $Y_k$  = Korea students' average math achievement test scores;  $Y_a$  = American students' average math achievement test scores;  $Y_{ka-i}$  = Korean-American immigrant students' average math achievement test scores;  $Y_{ka-n}$  = Korean-American native students' average math achievement test scores;  $S_k$  = Korea students' average math achievement standard for proficiency;  $S_{ka-i}$  = Korean-American immigrant students' average math achievement standard for proficiency;  $S_{ka-n}$  = Korean-American native students' average math achievement standard for proficiency;  $S_a$  = American students' average math achievement standard for proficiency

On the other hand, we also expect very different distributions of math achievement proficiency standards, that is, Desired Achievement Level (DAL) for Korea (left-hand side bar) and DAL for U.S. (right-hand side bar). The average proficiency standards/expectations differences between Koreans (eighth-grade students in Korea) and Americans (eighth-grade students in the U.S.) are equivalent to the vertical distance between  $S_k$  bar and  $S_a$  bar:  $S_k - S_a$  = Korea-US math achievement proficiency standard gap. Because the DAL gap is even bigger than the AAL gap between the two countries, their Perceived Achievement Level

(PAL) gap is likely to become negative;  $(Y_k - Y_a) - (S_k - S_a) = \text{Korea-US math achievement self-rating gap}$ . In other words, American students are likely to rate their performance higher than Korean students. In a similar vein, the proficiency standard differences between Korean-American 8<sup>th</sup> grade students in the U.S. and all American 8<sup>th</sup>-grade students in the U.S. may cause relatively lower self-rating among Korean-American students. Based on relevant theory and prior research, it is hypothesized that Perceived Achievement Level in math (PALm) as measured by self-ratings follows this rank order: Americans > Korean-American natives > Korean-American immigrants > Koreans.

### Results

Figure 3 shows math achievement gaps in both test scores (black bar) and self-ratings (white bar) among Koreans, Korean-American immigrants, and Korean-American natives. For the sake of facilitating comparable interpretation on a common scale, all of the gap measures were reported in Cohen's effect size ( $d$ ) metric; the average group score differences were divided by corresponding standard deviations for the U.S. student sample (reference group).

For math test scores, Korean-American students, both immigrants and natives, perform significantly better than the average American students (zero-value horizontal reference line) including White students as well as other racial and ethnic minority groups. However, the Korean-American vs. average American math achievement gap within the U.S. is much smaller than the gap between the U.S. students and the Korean native students. Specifically, the Korean-American vs. average American achievement gap ( $0.66 \sigma$ ) in grade 8 math based on ECLS-K 2007 data is about half of the gap between American students and Korean students ( $1.25 \sigma$ ) in grade 8 math based on TIMSS 2007 data; both gaps are statistically significant, while one gap—American vs Korean—is significantly greater than the other—

American vs Korean-American achievement gap (see Figure 3). When Korean-American students are further classified into immigrants (1<sup>st</sup> and 2<sup>nd</sup> generations) vs. natives (3<sup>rd</sup> generation and above), it turns out that immigrants perform better than natives ( $0.78 \sigma$  vs.  $0.43 \sigma$ ).

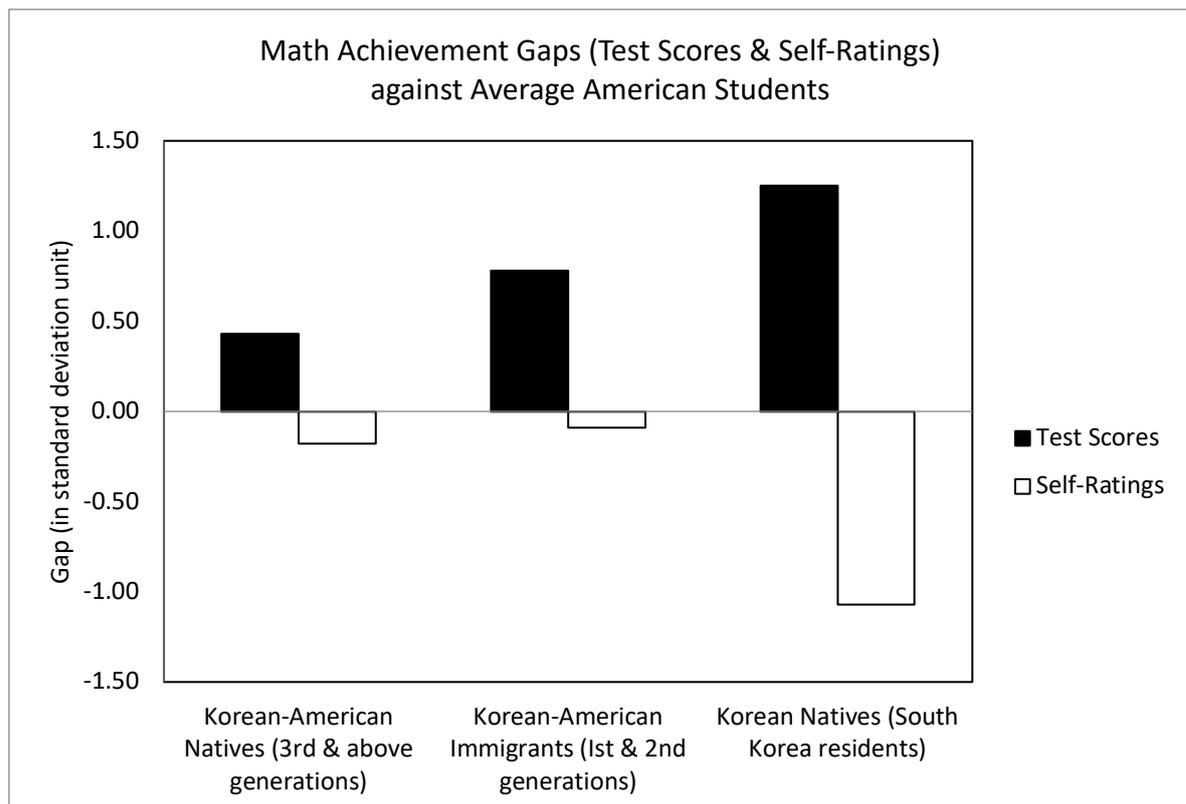


Figure 3. Math Achievement Gaps in Test Scores vs. Self-Ratings among Koreans, Korean-American immigrants, and Korean-American natives relative to average American students, 8th Grade in 2007

Those actual test score gaps are hardly attributable to family socioeconomic status (SES) differences among American, Korean, and Korean-American groups. The percentage of 8<sup>th</sup> grade students with college-educated parents was 49% for Koreans, 52% for Americans, and 69% for Korean-Americans (83% for immigrants and 63% for natives). After we match these sample groups of students by their average parental education level (reported

in both ECLS-K and TIMSS datasets), the test score gaps did not change much. The achievement gap between Korean and American students gets slightly larger ( $1.34 \sigma$ ), and the achievement gap between Korean-American and average American students gets a little smaller ( $0.54 \sigma$ ) after adjustment for parental education gaps. Further, the adjusted gap between immigrant Korean-American students and American students ( $0.62 \sigma$ ) remains larger than the adjusted gap between native Korean-American students and American students ( $0.51 \sigma$ ).

On the other hand, it seems that Korean high academic standards and overachievement takes a toll on their academic self-concept, that is, perception of their math achievement (PALm). Only 43.5% of Korean 8<sup>th</sup> grade students said that they usually do well in math, whereas 83.3% of American 8<sup>th</sup> grade students said the same; the gap was negative in direction and large in size ( $-1.07 \sigma$ ). Similar pattern of the opposite gap, albeit to a lesser extent, was observed between Korean-American students and average American students. In the U.S., 68.5% of American 8<sup>th</sup> grade students said that they get good grades in math, whereas 63.2% of Korean-American 8<sup>th</sup> grade students said the same; the gap was negative but very small in size ( $-0.11 \sigma$ ). The difference between immigrants and natives among Korean-American students was also too small to be significant (64.3% for immigrants vs. 60% for natives). This non-linear gap pattern for self-ratings is contrary to expectations and different from the linear pattern of test score gaps; the trending patterns of test score vs. self-rating gaps (black vs. white bars in Figure 3) are not straightforward mirror images of each other across the horizontal reference line (value of zero).

## Discussion

The study is aimed at understanding multi-faceted and transnational nature of the achievement gaps with focus on the case of Korean and Korean-American students. The

study adds an international dimension to the research on achievement gaps between immigrants and native students in the U.S. Existing research has drawn heavily upon achievement norms from American student samples. Although there are increasing references being made to high-performing countries on international tests, research on domestic achievement gaps and international achievement gaps remains largely separate and traditionally has not informed one another. In an increasingly globalized world and internationally competitive higher education market, the problems of domestic achievement gaps (racial and ethnic gaps within the U.S.) and international achievement gaps are intertwined. Fresh insights into achievement gap problems can be gained by integrating the two separate lines of analyses.

The analysis suggests that observed group differences in achievement test scores vs. self-ratings reflect the confluences of cultural and institutional forces. In terms of actual math achievement as measured by standardized test scores, it turns out that Korean students perform significantly better than Korean-American immigrant students who in turn perform better than Korean-American native students. Korean-American students' math achievement is intermediate between native Korean students and American students. Korean-American native students were more similar to typical American students than to typical Korean students in terms of math achievement test scores. In contrast, Korean-American immigrants are more similar to typical Korean students than to typical American students in math test performance. Despite having similar cultural background characteristics and relatively lower level of parental education, Korean students perform significantly better than the Korean-American immigrants whose parents or who themselves were born in Korea.

On the contrary, in terms of perceived math achievement as measured by students' self-ratings, Korean students have significantly lower self-concept than Korean-American (both immigrant and native) students. It is worth noting that among Korean-American students,

there are no significant differences in perception but significant differences in test scores by generation status. The findings imply that Korean students are more like a “small frog in a big pond”, whereas Korean-American students are more like a “big frog in a small pond.” High academic expectations and pressure seem to play a double-edged sword role for students’ academic achievement and self-concept. There are no clear winners, since the dynamics of a small frog in a big pond vs. a big frog in a small pond may have counterbalancing effects. Moreover, in spite of high academic performance on average, both Korean and Korean-American student groups would need psychological help with self-concepts; they may struggle with the stereotype threat of model nationality or model minority in terms of educational success. Subsequent studies need to examine long-term effects and implications of middle school students’ actual vs. perceived academic achievement gaps in terms of their future college and career success.

## References

- Attewell, P. (2001). The winner-take-all high school: Organizational adaptations to educational stratification. *Sociology of Education*, 74, 267-95.
- Baker, D. P. (2003). Should we be more like them? Reflections on causes of cross-national high school achievement differences and implications for American educational reform policy. In D. Ravitch (Ed.), *Brookings papers on education policy* (pp.309-325). Washington, DC: Brookings Institution.
- Carpenter, D. M., Ramirez, A., & Severn, L. (2006). Gap or gaps: Challenging the singular definition of the achievement gap. *Education and Urban Society*, 39(1), 113-127.
- Espenshade, T. J., Hale, L. E., & Chung, C. Y. (2005). The frog pond revisited: High school academic context, class rank, and elite college admission. *Sociology of Education*, 78(4), 269-293.
- Fukuyama, F. (1993). Immigrants and family values. *Commentary*, 95(5), 26-32.
- Gorski, P. (2008). The myth of the "culture of poverty". *Educational Leadership*, 65(7), 32-36.
- Gudykunst, W. B. (2004). *Bridging differences: Effective intergroup communication* (4<sup>th</sup> ed.). Thousand Oaks, CA: Sage.
- Gutiérrez, K. D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher*, 32(5), 19-25.
- Kim, E. (2002). The relationship between parental involvement and children's educational achievement in the Korean immigrant family. *Journal of Comparative Family Studies*, 33(4), 529-540.
- The Korea Times (2010, February 20). *Obama praises Korean education again*. Retrieved from [http://www.koreatimes.co.kr/www/news/nation/2010/04/113\\_61138.html](http://www.koreatimes.co.kr/www/news/nation/2010/04/113_61138.html).
- Kwon, S., Lee, M., & Shin, D. (2015). Educational assessment in the Republic of Korea: Lights

- and shadows of high-stake exam-based education system. *Assessment in Education: Principles, Policy & Practice*, 29, 1-18.
- Lee, J. (2002). Racial and ethnic achievement gap trends: Reversing the progress toward equity? *Educational Researcher*, 31(1), 3-12.
- Lee, J. (2016). The anatomy of achievement gaps: *Why and how American education is losing (but can still win) the war on underachievement*. New York: Oxford University Press.
- Lee, S. J. (2009). *Unraveling the "model minority" stereotype: Listening to Asian American youth* (2nd ed.). New York: Teachers College Press.
- Lee, J., Liu, X., Amo, L., & Wang, W. (2014). Multilevel linkages between state standards, teacher standards, and student achievement: Testing external vs. internal standards-based education models. *Educational Policy*, 28(6), 780-811.
- Lew, J. (2006). *Asian Americans in class: Charting the achievement gap among Korean American youth*. New York: Teachers College Press.
- Lewis, O. (2011). *The children of Sánchez: Autobiography of a Mexican family* (2nd ed.). New York: Vintage Books.
- Marsh, H. W., Koller, O., & Baumert, J. (2001). Reunification of East and West German school systems: Longitudinal multilevel modeling study of the big-fish-little-pond effect on academic self-concept. *American Educational Research Journal*, 38, 321-350.
- National Center for Education Statistics. (2006). *Comparing mathematics content in the National Assessment of Educational Progress (NAEP), Trends in International Mathematics and Science Study (TIMSS), and Program for International Student Assessment (PISA) 2003 Assessments*. Washington, DC: Government Printing Office.
- Ogbu, J. U., & Simons, H. D. (1998). Voluntary and involuntary minorities: A cultural-ecological theory of school performance with some implications for education. *Anthropology and Education Quarterly*, 29(2), 155-188.

- Ravitch, D. (2007). *EdSpeak: A glossary of education terms, phrases, buzzwords, and jargon*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Schmidt, W. H., McKnight, C. C., & Raizen, S. T. (1997). *A splintered vision: An investigation of U.S. science and mathematics education*. Boston, MA: Kluwer Academic Publishers.
- Seth, M. J. (2002). *Education fever: Society, politics, and the pursuit of schooling in South Korea*. Honolulu, HI: University of Hawaii Press.
- Steinberg, L. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do*. New York: Simon & Schuster.
- Stigler, J. W., Smith, S., & Mao, L. W. (1985). The self-perception of competence by Chinese children. *Child Development, 56*, 1259-1270.
- Sue, S., & Okazaki, S. (1990). Asian-American educational achievements: A phenomenon in search of an explanation. *American Psychologist, 45*(8), 913–920.
- Thernstrom, A., & Thernstrom, A. (2003). *No excuses: Closing the racial gap in learning*. New York, NY: Simon & Schuster.
- Wang, J., & Lin, E. (2005). Comparative studies on U.S. and Chinese mathematics learning and the implications for standards-based mathematics teaching reform. *Educational Researcher, 34*(5), 3-13.
- Whang, P. A., & Hancock, G. R. (1994). Motivation and mathematics achievement: Comparisons between Asian-American and non-Asian students. *Contemporary Educational Psychology, 19*(3), 302-322.
- Zhou, M., & Kim, S. (2006). Community forces, social capital, and educational achievement: The case of supplementary education in the Chinese and Korean immigrant communities. *Harvard Educational Review, 76*(1), 1-29.