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Proposal Details

Personal Information

Name	Dr. Jaekyung Lee
Informal Name	Jaekyung
Institution / Affiliation	SUNY College at Buffalo
Unit / Department	Counseling, School and Educational Psychology
Title	Professor
Preferred Mailing Address	409 Baldy Hall
City	Buffalo
Country	United States
State	NY
Zip/Postal Code	14260-0000
Email	jl224@buffalo.edu
Phone	716-645-2484
Fax	

Financial Representative

Name	Mr. Bradley Bermudez
Informal Name	
Institution / Affiliation	University at Buffalo, State University of New York (SUNY)
Unit / Department	Sponsored Programs Services
Title	Senior Agreement Administrator
Preferred Mailing Address	402 Crofts Hall
City	Buffalo
Country	United States
State	NY
Zip/Postal Code	14260
Email	bermude@buffalo.edu
Phone	716-645-2760
Fax	

Secondary Investigator

1. Secondary Investigator Information

Name	Dr. Lois Weis
Informal Name	
Institution / Affiliation	University at Buffalo, State University of New York (SUNY)
Unit / Department	Department of Educational Leadership and Policy

Title	SUNY Distinguished Professor
Preferred Mailing Address	468 Baldy Hall
City	Amherst
Country	United States
State	NY
Zip/Postal Code	14260
Email	weis@buffalo.edu
Phone	716-645-1079
Fax	

Project Description I

Title:

High School Pathways to Postsecondary Education Destinations: Integrated Multilevel Analyses of NELS, ELS and NCES-Barron's Datasets

Statement of the research problem and national importance:

   The proposed project explores high school pathways to postsecondary institutions under conditions of large-scale expansion of higher education (herein termed massification; Trow, 2006). While important work has been done on the extent to which educational expansion reduces or magnifies inequality, there has been remarkably little exploration of the pathways through which students of varying backgrounds end up in differentially positioned institutions of higher education as the higher education system itself expands. Where such work has been done, the focus is generally on a set of background characteristics (race, SES, gender) coupled with some measure of educational experience (usually achievement test scores) as predictors of attaining *any* postsecondary education. More recently, scholars have started to model the chances of entering/attending baccalaureate granting, highly selective and/or two-year institutions based on these same individually driven predictor variables. A central hypothesis of our work is that secondary school institutional arrangements play a key role in shaping stratification processes, in this case postsecondary destinations. Specifically, we hypothesize that structural location of secondary school both as hierarchically ranked and as providing varied opportunities (e.g., achievement test scores, AP/IB examinations, SAT/ACT scores, GPA) for later moves and access to various kinds and levels of attainment will be a key factor (above and beyond the entering characteristics of students) in overall pathways to differentially positioned postsecondary destinations. We will investigate this question over a 12 year time period, providing a policy driven longitudinal component to the project.

   The focus on the role of institutional arrangements in shaping hierarchically arranged PS destinations constitutes an important contribution to the literature on the mechanisms through which inequalities of postsecondary opportunities are reduced or magnified in concert with the expansion of higher education. This research is critical in light of the unreflective assumption that expansion of access will, in and of itself, reduce inequalities. The proposed research constitutes a unique and important contribution to this key area in three interrelated ways: 1) a targeted exploration/conceptualization of secondary schools as hierarchically ranked and as providing varied opportunities for later moves into the postsecondary sector; 2) a more nuanced measure of institutional selectivity than routinely employed in such research; and as facilitated by the relatively recent release of the Barron's selectivity index data; and 3) a longitudinal component as specifically linked to broader sociological discussion of educational expansion as a mechanism for increasing equality of access, in this case

postsecondary education.

The proposed research is linked to critical policy concerns regarding meaningful access to postsecondary institutions. Although the rhetoric of "higher education for all" and "increased access to higher education" sound promising (and indeed, must be understood as a "positive" turn in light the opening of opportunities for previously disenfranchised groups in the US population), we need far more serious analyses of existing databases to assess empirically what happens with regard to postsecondary access patterns as the postsecondary system itself undergoes major expansion. In other words, we must take more seriously the "access to what" question in light of postsecondary massification. Additionally, we need empirically driven and nuanced analyses of the pathways to varying types of postsecondary institutions, and specifically the role of the secondary school opportunity structure in positioning students for postsecondary entrance. This will enable a more informed discussion about policy matters related to access to higher education, as well the specific contribution of secondary school opportunity structure to outcomes of interest. Such analyses are facilitated by merging NCES longitudinal education datasets with the relatively recently released Barron's dataset, which enables more serious and nuanced attention to this question.

AIR funded two important projects in 2010-2011 that are intellectually linked to the proposed research, offering great potential for marked progress in this critically important area (Engberg and Wolniak; and Bastedo). Engberg and Wolniak focus on high school context and socioeconomic status as predictor of postsecondary education. We focus on a more nuanced range of postsecondary access patterns, and we explore the extent to which where students are located in the structure of opportunities at one stage limits their possible locations at the next stage, and address this over time. Bastedo's study tracks change in patterns of race and gender stratification across four NCES datasets. The proposed research focuses specifically on secondary school location as hierarchically ranked and as providing varied opportunities for access to varying postsecondary institutions. Our proposed research both builds upon and simultaneously differs from Engberg/Wolniak and Bastedo. We consider the three studies highly complementary. Importantly, our study will add critical additional information to what AIR has already funded.

Review the literature and establish a theoretical grounding for the research:

Arum, Gamoran and Shavit (2007) argue the most important question regarding educational expansion is "whether it reduces inequality by providing more opportunities for persons from disadvantaged strata, or magnifies inequality by expanding opportunities disproportionately for those who are already privileged" (2007, p.1). Focusing on the relationship between forms of higher education expansion and social stratification in worldwide context, the volume constitutes an important contribution to the literature on educational expansion and democratization of access. In addition to this emerging body of scholarship, we have a more long standing body of research on the extent to which educational expansion reduces or magnifies inequality in academic achievement as measured by secondary school test scores and with specific attention to testing hypotheses related to "maximally maintained inequality" and "effectively maintained inequality" (Gamoran, 1987, 2001, 2008; Raftery and Hout, 1993; Lucas, 2001; Campbell, Hombo and Mazzeo, 2000; Hout, Raftery and Bell,1993).

Given the importance of these two strands of research, surprisingly little attention has been paid to the secondary to

postsecondary pipeline in relation to these issues. Although excellent research exists in both secondary and postsecondary sectors, the two bodies are largely disconnected. Where research on the secondary to postsecondary pipeline does exist, researchers generally employ a set of individually measured background characteristics (SES and race) coupled with some measure of secondary educational experience (usually test scores) as predictors of attaining *any* postsecondary education, and/or entering/attending baccalaureate-granting, highly selective and/or two year institutions (Roksa, Grodsky, Arum and Gamoran, 2007). By focusing specifically on the secondary to postsecondary pipeline over time, the proposed study draws together and extends important research in this area.

Kerckhoff (1995; 2001) posed an important question regarding the extent to which where students are located in the structure of educational opportunities at each stage limits their possible locations at the next stage. "Our growing knowledge of the role of institutional arrangements in shaping stratification processes suggests two kinds of modifications of the status attainment approach to modeling social stratification processes. One of these is to conceptualize intergenerational mobility as a series of moves through structural locations in social organizations (e.g., schools, firms). The other is to view these structural locations both as hierarchically ranked and as providing varied opportunities for later moves and access to various kinds and levels of attainment" (1995, p. 324). The proposed study takes Kerckhoff's observation at its starting point, with specific attention to the extent to which where students are located in the structure of educational opportunities in secondary schools empirically limits their possible locations at the postsecondary level. By engaging a longitudinal design, the proposed work links two critical scholarly areas while simultaneously making an independent contribution to each (expansion of postsecondary education and effects of secondary school institutional arrangement as per Kerckhoff's definition).

There is a rich literature on the myriad ways that SES and race stratification in families and educational institutions *potentially* affect postsecondary attendance patterns (Lee and Bryk, 1988; Hoogstra, 2000; Lareau, 1989, 2003; Oakes, 1985, 1990; Gamoran and Mare, 1989; Gamoran, 1987; Lucas, 2001; Kelly, 2008; Nichols and Berliner, 2007; Aaronson, Barrow & Sander, 2007; Burkam & Lee, 2003; Ma & McIntyre, 2005; Riegle-Crumb, 2006; Wimberly & Noeth, 2005; Oakes, Joseph and Muir, 2003; Haney et.al., 2005; Orfield and Lee, 2005). This voluminous body largely focuses on predictors of academic achievement at the secondary level, as measured by test scores, and does not empirically link what goes on in secondary school with postsecondary destination patterns. More recently Roksa, Grodsky, Arum and Gamoran (2007) explore postsecondary entrance patterns, but do not investigate the secondary school sector as hierarchically organized and/or as predictor of postsecondary opportunities, nor do they employ a nuanced notion of PS institutional selectivity such as we propose.

Important research has also been conducted on factors related to the postsecondary sector (e.g., changes in financial aid policies; increased marketization of higher education) that press towards particular patterns of college attendance (and outcomes in some cases). However, this body of research rarely addresses empirical connections between secondary schools and postsecondary destinations (Avery and Kane, 2004; Heller, 2001, 2002; Hoxby, 1997). Although Bowen, Chingos and McPherson(2009) evidence targeted attention to type of high school as predictor of PS opportunities, they concentrate solely on public colleges/universities rather than examine a range of PS destinations[1].

Few studies analyze secondary school level effects on what Hill (2008) calls the "college linking process." Her research on

institutional secondary school arrangements as predictor of postsecondary entrance patterns informs the proposed research. However, Hill focuses exclusively on college counseling at the secondary school level rather than a broader range of school based factors.

The effects of school location (urban, suburban and rural) on student performance have often been mixed and may be better understood when we take into account demographic and organizational contexts in which schools work (see Brooks-Gunn, Duncan, & Aber, 1997; Hallinan, 1988; Jencks & Mayer, 1990; Khattri et al. 1996; Wong & Lee, 1998; Lippman et al., 1996). Likewise, the effects of school type (public vs. private) on academic achievement and educational attainment also produced mixed results, with attendant controversies (Gamoran, 1987; Bryk et al., 1993; Coleman, Hoffer and Kilgore, 1982; Hoffer et.al, 1985; Chubb & Moe, 1990; Gamoran, 1996; Braun et al., 2006; Lubienski et al., 2006). These mixed results from two separate lines of research have confused educators and policymakers as to important variables that might be addressed to improve student's academic achievement and subsequent transition into postsecondary education. Gamoran's research on the effects of type of school attended on academic achievement is particularly germane to the proposed study. However, Gamoran does not focus on these variables as predictor of postsecondary destination. The proposed study builds on prior research so as to combine both school location and type effects to develop a more refined categorization of school setting. Additionally, by exploring the impact of type and location of secondary school on PS destination, the proposed research enters critical intellectual and policy related territory in our increasingly knowledge-based economy.

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[1] Much research remains to be done in light of Kerckhoff's important comments. For example, although we have much excellent research on the ways in which and the extent to which secondary school arrangements/opportunities are related to academic achievement, we know relatively little when we conceptualize secondary school location as hierarchically ranked and as providing varied opportunities for access to varying type and level of attainment. In the case at hand, there is relatively little research on the ways in which and extent to which variations across secondary school serve to limit possible locations with regard to PS destination (type, prestige etc., with serious potential implications for PS persistence, graduation, access to post-graduate study and the like). Arum, Shavit and Gamoran's (2007) volume on postsecondary access, for example, does not specifically address secondary school opportunity structure as linked to postsecondary destinations. Although the volume focuses on nature of eligibility for postsecondary attendance in worldwide context, thereby invoking the secondary school sector, authors do not specifically or uniformly address the empirical links between secondary school arrangements and postsecondary opportunities. On the other hand, work by Bowen, Chingos and McPherson (2009) on persistence and postsecondary completion patterns evidences more targeted attention to type of high school (size of senior class; racial/ethnic mix; urban/suburban/rural location; neighborhood wealth; and academic standing as measured by SAT/ACT test-taking behavior and average scores, and percentage of students who took at least one AP examination) as predictor of postsecondary possibilities. As they take as their starting point the analysis of 1999 cohort students who enrolled at public colleges and universities (including public flagships, less selective publics, and HBCU's), it was not their intention to consider linkages between type of high school as defined in the proposed study and a wide range of PS destinations (publics and privates of varying selectivity; two versus four year and the like). Although both studies inform the proposed work, sustained attention to linkages between high school opportunity structures and a wide range of PS destinations does not constitute the focus of either study.

Describe the research method that will be used:

This study uses multilevel correlational research design to explore the impact of high school type and location on students' transition into postsecondary education. Based on prior research, we will build multilevel models to "explain" variation in postsecondary education destinations based on key school settings (location and type) and other variables. We will use two NCES national longitudinal datasets, the National Education Longitudinal Study (NELS) and the Educational Longitudinal Study (ELS), both

of which provide information on transition from high school to postsecondary education along with student, family and school characteristics.

First, we will cross-classify students in both NELS and ELS samples based on their high school origin (by type/location) and PSE institution destination (by type/selectivity). Table 1, cross-break table, illustrates our tentative classification scheme for preliminary analysis of the relationship between high school setting variable (14 categories) [1] and PSE institution type variable (8 categories) [2]. For PSE institution types, we will also consider public vs. private distinction on top of 2-year vs. 4-year distinction and selectivity classifications. The frequency and percentage of NELS: 88 high school graduates and ELS: 2002 high school graduates who attended 4-year postsecondary institutions, will be compared by Barron's' admissions competitiveness rating (1992 ratings for NELS and 2004 ratings for ELS). Because both of the NCES datasets employed comparable sampling and assessment/survey designs, cross-cohort comparison of the results will enhance our understanding of any changes in the nature and type of student transition from high schools to PSE institutions over the past two decades.

Table 1 here

The data collected under both NELS and ELS is hierarchical in nature because students are nested within schools. Hierarchical linear models (HLM) address the problem of students nested within schools. The use of HLM on NELS and ELS data will cope with sampling error resulting from the multi-stage sampling. The data will be weighted at the student and school levels. The selectivity of PSE institutions as measured by Barron's rating of institution admissions competitiveness as well as the distinction between 4-year and 2-year colleges is used as the dependent variable. We, therefore, use "hierarchical generalized linear model" (HGLM) by specifying a nonlinear analysis appropriate for multinomial dependent variable (Raudenbush & Bryk, 2002).[3]

The outcome, Y_{ij}, takes on different values according to the chance that student i in school j enters different type of PSE institution including 4-year colleges/universities with differential level of selectivity (i.e., most competitive, highly competitive, very competitive, competitive, less competitive, noncompetitive) and 2-year colleges. We will test the hypothesis about the effects of high school location and type on different PSE destination. In addition, student and school-level covariates are important both in their own right and as controls for estimating unique effects of school location/type. We follow the sequence of testing multilevel mediation effects (2 → 2 → 1 and 2 → 1 → 1) as proposed by Krull and MacKinnon (2001). We hypothesize that the independent variable, school location/type at the school level (level 2), influences the mediators such as advanced course offering and academic learning climate at the school level (level 2) and advanced course-taking and academic achievement/aptitude at the student level (level 1) and that those mediators in turn influence the dependent variable, the odds of differential PSE destination at the student level (level 1).

One of tentative HLM models that regress the dependent variable (Y) on the independent variable (Z) along with mediators (M) and control variables (X and C) are shown below.

Level-1 model (Student Level):

$$Y_{mij} = b_{0j} + b_{1j}X_{1ij} + b_{2j}X_{2ij} + b_{3j}M_{1ij} + b_{4j}M_{2ij} + e_{ij}$$

Y_{mij} is the log-odds of falling into category *m* relative to category *M (the reference group/category) regarding* postsecondary educational

institution destination for student i in school j; $Y_{mij} = \log(P_{mij} / P_{Mij})$. In this case the reference group is those who did not attend any PSE institutions. The other six categories of 4-year colleges/universities and 2-year colleges are then compared to the non-PSE category.

b_{0j} is the intercept for school j, that is, adjusted school mean score;

X_{1ij} is the indicator of student i's race, which is a dummy variable for white student in school j;

X_{2ij} is the indicator of student i's family SES (a factor composite of parental education and income level, availability of reading materials at home, etc.) in school j;

M_{1ij} is a set of indicators of student i's taking advanced English and math courses (honors or AP courses) in school j;

M_{2ij} is a set of measures of student i's academic achievement/aptitude (SAT/ACT, high school GPA, standardized reading and math test scores at 12th grade) in school j;

e_{ij} is a Level-1 random effect that represents the deviation of student $_{ij}$'s score from the predicted log odds based on student-level model.

Level-2 model (School Level):

$$b_{0j} = g_{00} + g_{01}Z_j + g_{02}C_{1j} + g_{03}C_{2j} + g_{04}M_{1j} + g_{05}M_{2j} + r_{0j}$$

b_{0j} represents the school j's average log odds of students' PSE destination (m) adjusted for its composition of students' academic, racial, and social backgrounds.

Z_j is a set of dummy variables for the location/type of school j.

C_{1j} is student enrollment in school j.

C_{2j} is the average SES of school j.

M_{1j} is the indicator of offering advanced courses to students in school j.

M_{2j} is the measure of academic learning climate (a factor composite of academic press and support) of school j.

We will check model fits and address potential threats to internal validity. If our school variables are just proxies for unidentified selection factors in choosing between different location and types of schools, a model that accounts for the between-school differences is unlikely to be equally effective in explaining variability among schools within each type of location. As an empirical check, we will calculate—separately for each type and location—the variability in the estimated residuals on the basis of the unconditional model and conditional models. We then compute a proportion of the reduction in variability for random parameters in all school types/locations.

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[1] For the sake of illustration, we consider all possible categories here in this table. However, this tentative list of categories used for data analysis is subject to change after review of the frequency distribution results. If it turns out that certain categories end up with too few cases to give reliable estimates of the population, we will exclude them from analysis.

[2] Barron's organizes colleges into seven competitiveness categories. The exact criteria (i.e., cut points for SAT, ACT, GPA, and class rank) used to assign institutions to one of the seven categories are explained by Schmitt (2009). It reflects the degree of competitiveness of an institution with respect to a student gaining admission.

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[3] While these eight categories can be treated as hierarchically ordered, the student and school-level factors that predict competitive four-year colleges can be different from those that predict noncompetitive four-year colleges or 2-year colleges. In this case, it is useful to model the outcome as multinomial rather than ordinal so that information about the differential processes and contexts leading to different postsecondary destinations can be fully captured.

Uploaded Appendix Document(s):

- Table 1: Cross-Break of HS and PSE Types

Project Description II

Will you use NCES target dataset? Yes

Please check all NCES datasets that apply
- Educational Longitudinal Study of 2002 (ELS: 2002)
- National Education Longitudinal Study of 1988 (NELS:88)

Explain why each dataset best serves this research. Include a variable list for each dataset used.

Our study of these high school panel datasets involve the comparison of two separate cohorts at different periods (1988-1994 for NELS and 2002-06 for ELS) with common focus on the postsecondary education institution destination of high school graduates. The NELS:88 database is a nationally-representative sample of students in eighth grade in 1988, whereas the ELS:2002 database is a nationally-representative sample of students in tenth grade in 2002. This study will use data from grades 10 and 12 and approximately 2 years after high school graduation.

Our dependent Variable is PSE destination status. For institutional stratification, we merge NELS and ELS with NCES-Barron's data files that give "Barron's Seven Categories of Institution Admissions Competitiveness." Since the Barron's rating does not include institutions that offer only a junior or senior year of undergraduate study or junior or community colleges, we add a separate category for 2-year colleges.

Our key independent variable is high school setting as differentiated by school type and location. Based on the location of high school variable in the NELS and ELS data, we classify schools in large or mid-size city as "urban," schools outside the city within MSA (metropolitan statistical area) as "suburban," and schools outside MSA as "rural." At the same time, the type of high school is public (comprehensive, magnet) vs. private (Catholic, other religious, independent private). We combine these two variables to cross-classify schools into mixed type/location categories and explore their student and school/teacher characteristics to identify key mediators and extraneous variables.

Will you use NSF target dataset? No

Explain why each dataset best serves this research. Include a variable list for each dataset used.

Will you address the NPEC focus topic? No

If yes, please briefly describe:

Project Description III

Provide a timeline of key project activities:

May 2011-April 2012

 This one-year research project will be completed in the following order:

1. Analysis Planning and Data Preparation (Months 1-3)

    1. Determine the best analytical strategy and review technical issues in regards to the national datasets to be used (ELS and NELS with NCES-Barron's)
    2. Examine rationales for selected measurement and statistical models
    3. Prepare and merge data files
    4. Establish benchmarks for research tasks and ensure data security
    5. Collect and review prior research

2. Data Analysis and Interpretation (Months 4-10)

    1. Descriptive statistical analysis
    2. HLM analysis
    3. Repeat analyses separately for NELS and ELS and then compare/synthesize them
    4. Interpret and summarize the results

3. Write up a final report (Months 11-12)

List deliverables such as research reports, books, and presentations that will be developed from this research initiative:

    Two manuscripts will be written with an eye towards submission to two of the following tier one journals: AERJ-SIA,

Journal of Higher Education, Higher Education, and Sociology of Education. As noted in 2g below, results will be

disseminated through presentations at AERA, ASA, ESS, and the 2012 AIR Forum in New Orleans.

Describe how you will disseminate the results of this research:

    Results of the research will be disseminated through presentations at the following forums/conferences: AERA, ASA, ESS,

and the 2012 AIR Forum in New Orleans.

Provide a reference list of sources cited:

References

Aaronson, D., Barrow, L., & Sander, W. (2007). Teachers and student achievement in the Chicago Public Schools. *Journal of Labor Economics, 25*, 95-135.

Arum, R., Gamoran, A. & Shavit, Y. (2007). More inclusion than diversion: Expansion, differentiation, and market structure in higher education. In Y. Shavit, R. Arum and A. Gamoran, (Eds.), *Stratification in higher education: A comparative study*. Stanford, California: Stanford University Press, 1-38.

Avery C. & Kane, T. J. (2004). Student perceptions of college opportunities: The Boston COACH Program. In C. M. Hoxby, (Ed.). *College choices: The economics of where to go, when to go, and how to pay for it* (pp. 355-394). Chicago: University of Chicago Press.

Bowen, W.G., Chingos, M.M., & McPherson, M.S. (2009). *Crossing the finish line: Completing college at America's public universities*. Princeton and Oxford: Princeton University Press.

Brooks-Gunn, J., Duncan, G. and Aber, L. (Eds.) (1997) *Neighborhood Poverty: Context and Consequences for Children.* New York: Russell Sage Foundation.

Braun, H., Jenkins, F., & Grigg, W. (2006). *Comparing private and public schools using hierarchical linear modeling.* Washington, DC: Government Printing Office.

Bryk, A. S., Lee, V. E., & Holland, P. (1993). *Catholic schools and the common good.* Cambridge, MA: Harvard University Press.

Burkam, D. T., & Lee, V. E. (2003). Mathematics, foreign language, and science coursetaking and the NELS: 88 transcript data (NCES 2003–01). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Campbell, J.R., Hombo, C.M., & Mazzeo, J. (2000). NAEP trends in academic progress: Three decades of school performance. NCES document No. 2000-2469. Washington, DC: US Government Printing Office.

Chubb, J. E. and Moe, T. M. (1990). *Politics, Markets and America's Schools.* Washington, DC: Brookings Institution.

Coleman, J. S., Hoffer, T., & Kilgore, S. (1982). *High school achievement.* New York: Basic Books.

Gamoran, A. (1987). The stratification of high school learning opportunities. Sociology of Education, 60, 135-155.

Gamoran, A. (1996). Student Achievement in Public Magnet, Public Comprehensive, and Private City High Schools. *Educational Evaluation and Policy Analysis, 18*(1), 1-18.

Gamoran, A. (2001). American schooling and educational inequality: A forecast for the 21st century. *Sociology of Education, 74*, 135-153, Extra Issue.

Gamoran, A. & Mare, R. (1989). Secondary school tracking and educational equality: Compensation, reinforcement, or neutrality? *American Journal of Sociology, 94*, 1146 – 1183.

Hallinan, M. T. (1988). Equality of Educational Opportunity. *Annual Review of Sociolog*y, 14: 249-268.

Haney, W., Abrams, L., Madaus, G., Wheelock, A., Miao, J.,& Gruia, I. (2005). The   education pipeline in the United

States, 1970-2000: Trends in attrition, retention, and graduation rates. In L. Weis and M. Fine (Eds.), *Beyond silenced voices: Class, race, and gender in United States schools*, *revised edition*, (pp. 21-45). Albany, NY: State University of New York Press.

Heller, D. (2001). *The states and public higher education policy: Affordability, access and accountability.* Baltimore: Johns Hopkins University Press.

Hill, L. (2008). School strategies and the college-linking process: Reconsidering the effects of high schools on college enrollment. *Sociology of Education, 81*, 53-76.

Hoffer, T., Greeley, A., & Coleman, J. (1985). Achievement growth in public and Catholic schools. *Sociology of Education,58(2)*, 74-97.

Hoogstra, L. (2000). The Design of the Study: Sample and Procedures, In. Csikszentmihalyi and Schneider, B, (Eds). *Becoming adult*. New York. Basic Books.

Hout, M., Raftery, A. & Bell, E.O. (1993). Making the grade: Educational stratification in the United States, 1925-89. In Y. Shavit and H.P. Blossfeld (Eds.), *Persistent inequality: Changing educational attainment in thirteen countries* (pp. 25-49). Boulder, CO: Westview Press.

Hoxby, C. (1997). How the changing market structure of U.S. higher education explains college tuition. Working Paper 6323. Cambridge, MA: National Bureau of Economic Research.

Jencks, C.; Mayer, S. E. (1990). Social Consequences of Growing Up in a Poor Neighborhood. In L. E. Lynn, Jr. and M. G. H. McGeary, (Eds). *Inner City Poverty in the U.S.* Washington, D.C.: National Academy Press.

Kelly, S.P. (2008). Social class and tracking within schools. In L. Weis (Ed.). *The way class works: Readings on school, family, and the economy*, 210-224. New York: Routledge. Kerckoff, A. (1995). Institutional arrangements and stratification processes in industrialcountries. *Annual Review of Sociology, 21* 323-347.

Kerckoff, A. (2001). "Education and Social Stratification Processes in Comparative Perspective". <u>Sociology of Education</u>. Volume 4. Pp. 3-18.

Khattri, N., Riley, K.W., & Kane, M.B. (1997). Students at risk in poor, rural areas: A review of the research. <u>Journal of Research in Rural Education</u>, 13, 79-100.

Krull, J. L., & MacKinnon, D. P. (2001). Multilevel modeling of individual and group level mediated effects. *Multivariate Behavioral Research*, 36, 249-277.

Lee, V. & Bryk, A. (1988). Curriculum tracking as mediating the social distribution of high school achievement. *Sociology of Education, 61*, 78-94.

Lareau, A. (1989) *Home advantage: Social class and parental intervention in elementary education*. London: Falmer.

Lareau, A. (2003). *Unequal childhoods: Class, race and family life*. Berkeley, CA: University of California Press.

Lee, V. E., & Bryk, A. S. (1988). Curriculum Tracking as Mediating the Social Distribution of High School Achievement. *Sociology of Education*, 61(2), 78-94.

Lippman, L., Burns, S., & McArthur, E. (1996). Urban schools: The challenge of location and poverty. Washington, D.C.: National Center for Education Statistics.

Lubienski, C., & Lubienski, T. (2006). *Charter, private, public schools and academic achievement: New evidence from the NAEP mathematics dat*a. New York: National Center for the Study of Privatization in Education.

Lucas, S. (2001). Effectively maintained inequality: Education transitions, track mobility, and social background effects. *American Journal of Sociology, 106*, 1642-90.

Ma, X., & McIntyre, L. J. (2005). Exploring differential effects of mathematics courses on mathematics achievement. *Canadian Journal of Education, 28*, 827-852.

Nichols,S.L. & D.C. Berliner (2007). *Collateral damage: How high-stakes testing undermine education.* Cambridge: Harvard University Press.

Oakes, J. (1985). *Keeping track: How schools structure inequality*. New Haven, CT: Yale University Press.

Oakes, J. (1990). *Multiplying inequalities: Race, social class and tracking on students'   opportunities to learn mathematics and science*. Santa Monica, CA: RAND.

Oakes, J., Joseph, R., & Muir, K. (2003). Access and achievement in mathematics and science. In J.A. Banks & C.A.M. Banks, (Eds.), *Handbook of research on multicultural education, 2nd edition* (pp 69-90). San Francisco, CA: Jossey Bass.

Orfield, G. & Lee, C. (2005). Segregation 50 years after Brown: A metropolitan challenge. In L. Weis & M. Fine (Eds.). *Beyond silenced voices: Class, race, and gender in United States schools*, (rev. ed., pp. 3-20). Albany, NY: SUNY Press.

Raftery, A.E. & Hout, M. (1993). Maximally maintained inequality: Expansion, reform, and higher education in Irish education, 1921-75. *Sociology of Education, 66*, 22-39.

Raudenbush, S.W., & Bryk, A.S. (2002). *Hierarchical Linear Models: Applications and Data Analysis* (2nd ed.). Newbury Park, CA: Sage.

Riegle-Crumb, C. (2006). The path through math: Course sequences and academic performance at the intersection of race-ethnicity and gender. *American Journal of Education, 113*, 101–122.

Roksa, J, Grodsky, E, Arum, R. and Gamoran,A. 2007. "United States: Changes in Higher Education and Social Stratification". In Shavit, Y., Arum, R, & Gamoran, A. *Stratification in higher education: A comparative study*. Palo Alto: Stanford University Press., pp. 165-194

Schmitt, C. M. (2009). *Documentation for the Restricted-Use NCES-Barron's Admissions Competitiveness Index Data Files: 1972, 1982, 1992, 2004 and 2008* (NCES 2010-330). National Center for Education Statistics, Institute of Education Sciences. U.S. Department of Education. Washington, DC.

Wimberly, G. L., & Noeth, R. J. (2005). *College readiness begins in middle school*. Iowa City, IA: American College Testing.

Wong, K. K., & Lee, J. (1998). Interstate variation in the achievement gap among racial and social groups: Considering the effects of school resources and classroom practices. Advances in Educational Policy Vol. 4, Greenwich, CT: JAI Press

IRB Statement

Statement of Institutional Review Board approval or exemption:

From Christian Marks, Ph.D., CIP, Social and Behavioral Sciences Institutional Review Board (SBSIRB) Administrator, University at Buffalo: "I am authorized as the designee of the SBSIRB Chair to provide determinations as to whether or not a project constitutes human subjects research and if a project engages UB or its affiliates in human subjects research. Based on the information provided, the project does not meet the definition for human subjects research under the federal definitions used by UB. This is because there is neither intervention nor interaction between the research team and the subjects to obtain the data and the data is not identifiable private information. As such UB is not engaged in human subjects research and no UB IRB approval is needed for your participation."

Statement of Use of Restricted Datasets

The proposed research uses NELS, ELS, and Barron's restricted use datasets. Both Jaekyung Lee and Lois Weis have all appropriate licenses in hand for use of these datasets.

Biographical Sketch

Jaekyung Lee's Biography Sketch

Jaekyung Lee is a professor of education at the State University of New York at Buffalo, and a 2009-10 Fellow of the Center for Advanced Study in the Behavioral Sciences at Stanford University. His current fields of scholarly work encompass educational policy analysis, assessment and evaluation, and quantitative research methodology. A major part of his research agenda is to conduct empirical analysis of the effects of school reform policy and practice on student achievement gaps. Because his research is drawn predominantly from national databases, it holds particularly strong potential for improving P-16 education and school improvement in the United States. Trained as a quantitative educational policy researcher at the University of Chicago, Lee is very capable of applying advanced quantitative methods to educational policy research and program evaluation, including the applications of the Hierarchical Linear Modeling (HLM). His research has been published in major journals including *Educational Evaluation and Policy Analysis, American Education Research Journal, Review of Education Research, American Journal of Education.* To date, he has received ten national grants (8 grants as PI and 2 grants as co-PI). The awards came from high-profile, competitive sources, including the U.S. Department of Education (DOE) and the National Science Foundation (NSF).

Lee is also expanding his research horizon to P-16 (preschool through college). Building on an ecological perspective of human development as occurring within a dynamic environmental system, Lee studies the interplay between the trajectories of student achievement outcomes and educational policies. His recent article, "Tripartite Growth Trajectories of Reading and Math Achievement" (published in American Educational Research Journal) gives foundation for this line of research. Investigating the entire growth pattern from elementary through high school, the study suggested that American high schools take academically better-prepared students than the earlier generation but fail to help them prepare for colleges and universities well.

Lee will be primarily responsible for designing, conducting, and reporting statistical analyses for the AIR project.

Lois Weis's Biography Sketch

Lois Weis received her PhD in Educational Policy Studies from the University of Wisconsin-Madison in 1978. She is currently State University of New York Distinguished Professor of Sociology of Education at the University at Buffalo, State University of New York, one of only twenty-five faculty members across campus who hold this rank. She is the author and/or editor of numerous books and articles relating to race, class, gender, education and the economy. Her most recent volumes include The Way Class Works: Readings on school, family and the economy (Routledge, 2008), Class Reunion: The Remaking of the American White Working Class (Routledge, 2004), and Beyond Silenced Voices: Class, race and gender in United States Schools (edited with Michelle Fine, SUNY Press, 2005). She is a winner of the outstanding book award from the Gustavus Meyers Center for the Study of Bigotry and Human Rights in North America, as well as a seven-time winner of the American Educational Studies Association's Critic's Choice Award, given for an outstanding book. She is past-president of the American Educational Studies Association and current editor of the American Educational Research Journal-Social and Institutional Analysis section.

Lois Weis does not have extensive experience working with national datasets but has engaged research over the years that is intellectually linked to the proposed work. She has been PI on four Spencer Foundation grants and is currently CO-PI (with Margaret Eisenhart, University Distinguished Professor, University of Colorado) on a 1.5 million dollar NSF grant. The proposed AIR research is intellectually linked to the NSF grant in that it focuses on secondary school opportunity structures (particularly as related to STEM) and linkages to postsecondary admissions and choice of major. The proposed AIR grant does not duplicate efforts of the NSF grant. They are, however, complementary.

Weis and Lee represent intellectual collaboration at its very best. Weis is well known for her theoretical and qualitative work on produced and lived out social identities, social structure and the linkages between social identities, structure and education. One of the first scholars to focus in-depth attention on the role that lived out race, gender and class play in student experience, Weis is particularly well known for her nuanced, multi-layed, and complex analysis that not only uncovers key issues of gender, ethnicity, and social class, but also reveals the complicated system of intersections among them. Her longitudinal work represented by Working Class Without Work: High School Students in a De-Industrializing Economy (Routledge, 1990) and her already classic follow-up study, Class Reunion: The Remaking of the American White Working Class (Routledge, 2004) of these same students in their early thirties, particularly mark her theoretical and

methodological contributions. She has recently turned her attention to the pipeline through which secondary school students move towards tertiary education and will engage, with Lee, in the proposed piece of quantitative research that tests specific hypotheses related to her broader research trajectory.

Budget Requirements

Jaekyung Lee' Budget

Personnel-Time on Project
%(FTE) Academic Year: 0.00
%(FTE) Summer: 33.00

Personnel-Salary & Benefits
Academic Year: $ 0.00
Summer: $ 37597.00

Lois Weis's Budget

Personnel-Time on Project
%(FTE) Academic Year: 0.00
%(FTE) Summer: 0.00

Personnel-Salary & Benefits
Academic Year: $ 0.00
Summer: $ 0.00

Graduate Research Assistant's Budget

Personnel-Time on Project
%(FTE) Academic Year: 50.00
%(FTE) Summer: 50.00

Personnel-Salary & Benefits
Academic Year: $ 20340.00
Summer: $ 6780.00

Total Salary and Wages: $25967.01

Travel: $4500.00
Other travel related expenses: $0.00
Other research expenses: $8400.00
Total Request: $38867.01

Funding History

Neither PI has prior, current, or pending funding for the proposed research. Both Lee and Weis have no prior AIR funding.