



The National Coalition
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School Diversity

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**IS THERE SYSTEMATIC
MEANINGFUL EVIDENCE OF
SCHOOL POVERTY THRESHOLDS?**

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SUMMARY

Over the last five decades, a large body of research has demonstrated that concentrated school poverty undermines the educational progress of all students, especially pupils who are poor themselves. A handful of studies suggest there may be school-level poverty thresholds that influence achievement for some students in some subjects and grade levels. After a comprehensive review of the extant social, behavioral, and social science research, I found no reliable and valid body of evidence that points to specific thresholds of poverty concentration that can be used as the empirical basis for school assignment policies. We need more research on this

question using longitudinal, nationally representative datasets, employing state of the art statistical techniques to test for possible thresholds in different subjects, for demographic groups, and at various grade levels. Given the current state of our knowledge on the relationship of school-level poverty to achievement, *educational decision makers should focus on reducing concentrations of school-level poverty to as low a level as is feasible given the available demographic mix, and avoid policies based on the unsupported notion that there are poverty thresholds above and below which student achievement levels can be predicted.*

INTRODUCTION

For the last 50 years, social, educational, and behavioral scientists investigating the relationships among school socioeconomic (hereinafter “SES”) composition and educational outcomes have demonstrated time and again that schools with higher concentrations of students living in poverty provide less than optimal teaching and learning conditions, and they are especially harmful to the most vulnerable students who are, most often, youth living in neighborhoods of concentrated poverty and low-income students of color. Concentrated poverty in schools creates and sustains disparities in academic outcomes. High concentrations of students living in poverty complicate learning and teaching in schools, and reduce the effectiveness of other educational interventions designed to address gaps in academic outcomes. Short-term, “band-aid” solutions may improve some outcomes for some students in a particular school in a given year, but any gains are not sustained in the long-term.¹

Hundreds of studies by U.S. and international scholars have measured the effects of school demographic composition on educational outcomes. The most enduring of these is the 1966 Equality of

Educational Opportunity Report,² which found an association between school socioeconomic and racial composition and academic achievement. Since then, a large multidisciplinary³ body of educational, social, and behavioral science research has shown that the SES composition of schools influences students’ educational outcomes above and beyond their own family background, prior achievement, race, gender, and levels of effort or motivation. These studies demonstrate that students who attend schools with high concentrations of youth who live in poverty are not as academically successful—as measured by grades, test scores, promotion, and graduation rates—as their otherwise comparable peers who attend socioeconomically and racially diverse schools.

This research brief summarizes recent research about school SES composition effects on educational outcomes, with a focus on whether this enormous cross-disciplinary body of research supports claims that school poverty “thresholds” or “tipping points” exist. In other words, is there evidence of certain levels of school poverty concentrations above and below which students’ outcomes are affected?

1 Much of the enormous corpus of literature about school and classroom socioeconomic and racial compositional effects on students’ educational and life-course trajectories, neighborhoods, teachers, reforms, and school processes can be found in the *K-12 Integration, Desegregation, and Segregation Archive* (<https://k16diversity.uncc.edu>), a searchable database with close to 600 detailed abstracts of the social, educational, and behavioral science research disseminated since the late 1980s.

2 Coleman et al., 1966

3 This includes the educational, social, and behavioral science research abstracts found in the *K-12 Integration, Desegregation, and Segregation Archive* (<https://k16diversity.uncc.edu>).

The best studies about the relationships among SES and school outcomes tease out the influences of both individual student-level and school-level SES. Doing so allows researchers to focus on the school's contributions to student outcomes, holding constant the pupil's background characteristics. Research indicates that attending a school with high concentrations of low-income peers negatively influences individual students' outcomes, and this harmful relationship is stronger for

students from low-income backgrounds. The distinction between the contributions of school SES composition and individual SES background to students' outcomes is crucial because school policy makers can take actions to alter a school's poverty concentration while they cannot change a child's socioeconomic status.

HOW IS SCHOOL-LEVEL SES MEASURED?

School-level SES is generally understood as the average socioeconomic status of all students attending a given school. A student's SES is commonly indicated by whether or not the individual qualifies for free and/or reduced lunch (FRL).

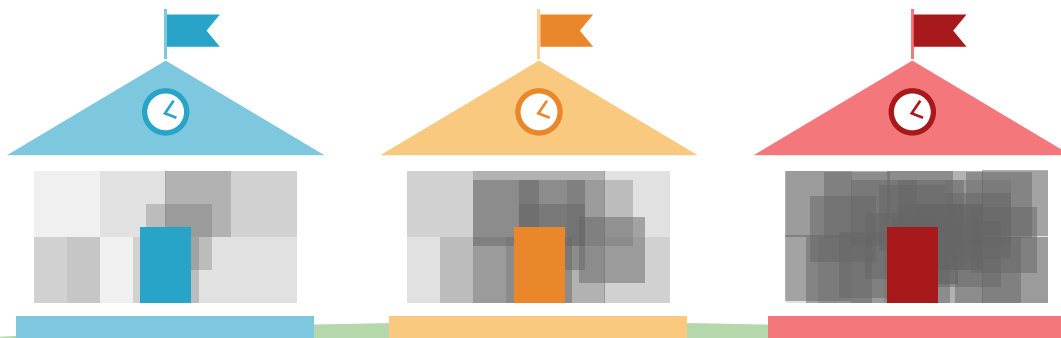
There are multiple problems with this measure of SES. First, it is an unreliable measure of poverty, especially among older students. Additionally, FRL is not a nuanced measure of poverty that incorporates any other dimensions of SES other than family income relative to family size, such as parental education levels. While some studies use better measures like parental income, occupation, and/or educational attainment as indicators of family SES, eligibility for free and/or reduced lunch was used in most U.S. studies of school SES composition effects discussed in this report.



If educators or other decision makers wish to enact evidence-based policies to boost student achievement by reducing concentrated poverty in schools, it would be useful to know whether there is a threshold, tipping point, or bandwidth (henceforth, “thresholds”) at which the effects of school poverty concentrations on educational outcomes are most harmful or relatively benign. It is also important to know whether any identified threshold effects operate similarly in some or all subject areas, and if they work similarly for students in different grades or with varying demographic

profiles. There is good reason to believe the influence of school SES composition actually varies by these factors. The literature on school racial composition’s influences on outcomes indicates, for example, that racial composition’s impact varies for students of different ages; genders; racial backgrounds; immigrant status; grade levels (elementary, secondary); subject areas (science, reading, mathematics); the intensity of school racial segregation; and the number of years a student experienced racially segregated education.

A SCHOOL'S POVERTY CONCENTRATION AFFECTS STUDENT EDUCATIONAL OUTCOMES



Do these effects operate similarly in some or all subject areas, or for students in different grades or with varying demographic profiles?

SUBJECT AREAS

**STUDENTS IN
DIFFERENT GRADES**

**VARYING STUDENT
DEMOGRAPHIC
PROFILES**

CLARITY ABOUT POSSIBLE SES THRESHOLDS

Clarity about possible SES thresholds and their effects is particularly relevant today, since the 2007 *Parents Involved in Community Schools*⁴ decision held the use of an individual student's race is (in most cases) an unconstitutional basis for school assignment. Educators and policy analysts increasingly have been looking to SES integration as an alternative or supplemental approach to equity-based reforms.⁵ A number of school districts nationwide have chosen to pursue strategies to minimize the impact of concentrated school poverty by drawing school assignments boundaries or designing school choice and magnet programs in ways that create socioeconomically diverse school populations. Other districts have been using combinations of SES and other factors to achieve both racial and economic integration.⁶

However, almost every study of school-level SES composition effects on educational outcomes uses what researchers consider a “continuous measure” of SES, typically the percent of a student body that qualifies for FRL. In general, continuous measures imply a linear relationship between school-

level SES composition and school outcomes. A positive linear relationship generally suggests that the effect of school poverty on student outcomes increases incrementally as poverty concentration grows, an implication that may or may not be justified.

Studies employing a continuous SES measure allow researchers to ascertain whether school SES composition is related to student educational outcomes and, if so, the strength of that relationship. However, studies that use continuous measures of SES do not allow policy makers to identify if there are thresholds of school poverty above and below which students' outcomes are affected. Nor do they indicate whether the effects vary in strength and direction at different concentrations of poverty, in different subject areas, or vary for different types of students based on their grade level, gender, or race/ethnicity. Yet, educational research on SES thresholds is relatively rare. But for the few exceptions discussed below, the handful of threshold studies in education examine racial composition tipping points or white residential flight triggers.⁷

4 *Parents Involved in Community Schools v. Seattle School District No. 1*, 551 U.S. 701 (2007)

5 U.S. Department of Justice [DOJ] & U.S. Department of Education [DOE], 2011; Kahlenberg, 2001, 2012a, 2012b

6 Ayscue, Frankenberg, & Siegel-Hawley, 2017; Parcel & Taylor, 2015

7 Brown-Jeffy, 2003; Card, Mas, & Rothstein, 2008; Giles, Cataldo, & Gatlin, 1975

REVIEW OF THE SOCIAL SCIENCE LITERATURE ON SCHOOL SES AND ACHIEVEMENT

This research brief addresses the question posed in the title: is there systematic meaningful evidence of school poverty thresholds? The answer to this question is important because it is potentially of great relevance to policy makers, educational practitioners, and parents making choices about where to send their children. The following section of this document briefly reviews the social and behavioral science research on school-level SES effects in general, and then reviews some of the most prominent threshold studies with the goal of identifying strengths or weaknesses of their research designs and findings, and if there are any broader conclusions we can draw from these reports based on the evidence they provide.

GENERAL LITERATURE ON SES AND EDUCATIONAL OUTCOMES

The research on the relationships among SES and educational outcomes is enormous and spans many decades and multiple disciplines. School composition research, also referred to as peer effects research, investigates either the socioeconomic levels or racial/ethnic mix of students, or both factors. The preponderance of these studies demonstrates that students who

HOW IS STUDENT ACHIEVEMENT MEASURED?

Student achievement can be measured by standardized test scores, grades, pass rates, or by various measures of student growth. Measurements of student achievement discussed in this research brief vary by state, school district, year in which the test was given, and type of measure (test scores, growth score, predicted growth scores, expected growth, proficiency levels, and so on). The absence of consistent measures of student achievement across studies complicates comparisons of results. However, tests such as the U.S. Department of Education's National Assessment of Educational Progress (NAEP), a nationally representative assessment of U.S. student knowledge in various subjects, permits comparisons across states and school districts. This is also true of the Organization of Economic Cooperation and Development's (OECD) testing program called Program for International Student Assessment (PISA), which assesses adolescents' reading, mathematics, and science literacy in OECD member states every three years.

attend schools that have high concentrations of disadvantaged students are less likely to score well on tests, earn high grades, graduate from high school, and succeed in college than their otherwise comparable peers who attend socioeconomically diverse schools.

Next, I highlight a few key research studies that report on the relationships between school SES and educational outcomes. They are emblematic of the highest-quality social science on the topic. Importantly, all of the studies utilize continuous measures of school-level SES and none directly examines the relationships of interest in this brief: SES thresholds.

I begin with an award-winning meta-regression analysis of SES and achievement studies and end the section with the most recent study that utilized longitudinal national test score data from almost every student and school system in the U.S.

Selcuk Sirin⁸ reviewed the published literature on SES and achievement between 1990 and 2000. His goal was to see if the relationship between SES and achievement had changed since earlier studies established the strength and direction of the association, and that both students' own SES and their school's SES composition were related to achievement. His metaregression analysis, which encompassed over 101,000 students, 6,871 schools, and 178 independent

districts, indicated that the SES-achievement relationship had changed little since White's⁹ 1982 seminal article on the topic. Student characteristics that moderated the relationships included grade level, minority status, and school location. Sirin found that the way a study measured SES (income, education, or FRL) influenced the size of the effects of SES on student outcomes. He noted that prior research indicated neighborhood and family characteristics also were influential factors in these relationships.

Richard Kahlenberg has synthesized research by scholars who investigate the relationships among school SES composition and school outcomes in a host of books and articles. He argues that while racial desegregation is important, without economic desegregation the benefits of diversity can be lost. Kahlenberg notes that 20 years ago, few school districts consciously sought to use SES as a basis for creating diverse schools. In the current era, school leaders increasingly choose to pursue SES diversity as a school reform strategy. And, indeed, there are documented benefits of this approach to improvement.¹⁰

Gregory Palardy and Russell Rumberger's research directly investigates the relationship of SES composition to academic outcomes.¹¹ Their 2005 study examined the impact of student demographics on the academic achievement

8 Sirin, 2005

9 White, 1982

10 Kahlenberg, 2001, 2012a, 2012b

11 Palardy & Rumberger, 2005

of a representative sample of secondary schools, using a large national data set (913 high schools and 14,217 students). They reported that the average socioeconomic mix of a school had as much impact on a student's achievement as the student's own family background. In 2013, **Palardy** used nationally representative data to examine the relationship between school SES composition and student attainment outcomes. Controlling for an array of student and school factors, he found that students who attend schools with concentrations of middle-class or higher-income students were far more likely to enroll at a 4-year college than students who attend schools with concentrations of low-income youths.¹²

A 2010 study by **Laura Perry and Andrew McConney** used 2003 Program for International Student Assessment (PISA) data to examine the SES profile of all secondary schools in Australia, disaggregated by student-level and school-level SES.¹³ Their two main observations were that increases in a school's average SES composition were associated with consistent increases in student academic achievement, and this relationship was similar for all students regardless of their individual-level SES.

In 2010, **Reyn van Ewijk and Peter Sleegers** published a meta-regression

analysis of 30 studies from Organization of Economic Cooperation and Development (OECD) countries (primarily European) that investigated school SES compositional effects.¹⁴ They showed that the way researchers measure SES influences the impact found. More nuanced, multi-factored measures of SES indicate a stronger impact on student achievement. Additionally, classroom-level measures of SES show a stronger impact on student achievement than school-level measures. Their cross-national results suggest that school-level SES continues to be an important contributor to individual students' academic outcomes.

Sean Reardon and Ann Owens have focused on SES and achievement outcomes since the early 2000s.¹⁵ They have documented how the growth in poverty has influenced achievement gaps, such that SES gaps now eclipse racial gaps in outcomes. In a 2016 study, **Reardon** analyzed 100 million test score records for students in grades 3-8 for virtually every public school district in the United States.¹⁶ He found clear evidence that students of color are much more likely than whites to attend high-poverty schools, and the disparity in their levels of exposure to school poverty is the single most powerful correlate of racial achievement gaps (also see **Bohrnstedt** and his colleagues who found similar patterns with respect to mathematics achievement).¹⁷

12 Palardy, 2013

13 Perry & McConney, 2010

14 van Ewijk & Sleegers, 2010

15 Reardon & Owens, 2014

16 Reardon, 2016

17 **Bohrnstedt**, **Kitmitto**, **Ogut**, **Sherman**, & **Chan**, 2015

Reardon's 2016 study is consistent with decades of school desegregation research that shows most of the damage from racial segregation comes not from the concentration of students of color in a school, but rather the concentration of low-income students in racially segregated schools.

His study indicates that high-poverty schools are, on average, much less effective than lower-poverty schools. As a result, strategies that reduce the differential exposure of black, Hispanic, and white students to low-income schoolmates may lead to meaningful reductions in academic achievement gaps. Additionally, he shows how a school's SES composition, its racial composition, and the interaction between the two forms of segregation shape educational outcomes for the nation's pupils.

STUDIES OF SES "THRESHOLDS" AND ACHIEVEMENT

My review of the literature about the relationships among SES and educational outcomes revealed surprisingly few SES threshold studies relative to the enormous corpus of research on SES composition effects. In his 2001 book *All Together Now*, Richard Kahlenberg cites several older studies that, while not precisely threshold studies, examined the relationships between

different concentrations of school poverty and student achievement outcomes.¹⁸

Orland found the poverty-achievement relationship was twice as large in medium- to high-poverty schools compared with low- to medium-poverty schools.¹⁹

Anderson, Hollinger, and Conaty's analysis of national data found that while there was a steady decrease in average test scores as the school poverty level increased, the greatest decrements were found in schools in the two poorest categories.²⁰

David Rusk's study of 186 Texas school districts found that middle class achievement declined only in schools with a majority of low-income students.²¹

More recently, **Gregory Palardy** tested specifically for actual SES thresholds using large scale survey data by comparing student's learning trajectories in high, medium, and low SES schools. His results suggest there is a threshold effect for attending a low SES composition school but his study did not locate the threshold with precision.²²

While provocative, none of the aforementioned studies have garnered the public's attention as much as the three influential SES threshold studies that I describe next.

18 Kahlenberg, 2001

19 Orland, 1990

20 Anderson, Hollinger, & Conaty, 1992

21 Rusk, 1998

22 Palardy, 2008



WAKE COUNTY, NC: The Wake County Public School System (WCPSS) in Raleigh, NC is widely recognized for its pupil assignment plan based on SES composition and student performance.²³ The plan created diverse schools by assigning students so that no school had more than 40% of students on free and/or reduced lunch or more than 25% of pupils not performing at grade level as measured by North Carolina’s End-of-Year standardized tests (also referred to as “EOG tests”).

In 2001, **Karen Banks** conducted a study to estimate the effectiveness of the schools in the truncated range of 35-40% poverty.²⁴ School effectiveness was defined in terms of student growth, measured as at or above proficiency on the 1999-2000 EOG tests in reading and mathematics for students in grades 3-8. Her findings supported the policy that set 40% as a target maximum

percentage of low-income students in a given school.

Specifically, Banks found:

Patterns of achievement growth were different for elementary and middle school students within each range of poverty. Elementary school poverty levels were more strongly related to achievement growth than middle school poverty levels.

School-level poverty had a small, statistically significant and substantively meaningful negative effect on educational growth on EOG standardized test scores in reading and mathematics in all grades. The magnitude of the effect varied across grades and subjects.

Small differences in school poverty levels (e.g. 25% vs. 30%) did not have a major impact on students’ EOG scores. However, large differences in poverty levels (for instance, 5% compared with 40%) appeared to have a 1-2 point negative impact on EOG scale scores, which equated to educationally meaningful difference.

23 Parcel & Taylor, 2015

24 Banks, 2001 Note: WCPSS’s study examined expected achievement growth.

Several factors limit the generalizability of the 35-40% poverty threshold in WCPSS to other school districts or for designing educational policy:

Proficiency levels on North Carolina EOG tests change every time a new test is released. This makes any generalizations about poverty thresholds' relationship to proficiency levels using Banks' findings problematic at best because EOG tests and their proficiency level cut scores are regularly changed with each new version of a test.

Unlike most large urban school systems, at the time of this study WCPSS had relatively little poverty overall. Only a few schools in the district exceeded the 35-40% poverty threshold, suggesting this study's findings are limited in their generalizability to other systems.

WCPSS's elementary schools showed some relationships between school-level SES and proficiency in some grades and subject areas, but there were few relationships between middle school (grades 6-8) SES and student proficiency levels.

The results showing an impact of school-level SES concentrations on student performance in reading (in grades 3, 4, and 6) and math (in grades 2, 6, 7, and 8) were difficult to interpret in a meaningful way because they fluctuated widely in their magnitude.

Notably, in a 2015 study, **Douglas Lauen and Michael Gaddis** revisited the relationship between school SES

composition and achievement in WCPSS. They concluded that causal claims about the effects of classroom poverty exposure on achievement growth may be unwarranted. Thus, here are two studies, conducted in the same school system at different points in time, yielding contrasting results on the central issue of interest in this research brief.²⁵



MONTGOMERY COUNTY, MD: Heather Schwartz examined the school performance of approximately 850 low-income students from 2001 to 2007. They all lived in public housing and attended elementary schools in neighborhoods that fell along a spectrum of very-low-poverty to moderate-poverty rates. The sample included only non-special education pupils living in public housing and enrolled in Montgomery County elementary grades K–6 for at least two consecutive years within the 2001–07 school-year period.

25 Lauen & Gaddis, 2015

Schwartz's key findings are:

Over a period of five to seven years, children in public housing who attended the school district's most advantaged schools (as measured by either the school's FRL composition or the district's own criteria) far outperformed in math and reading those children in public housing who attended the district's least advantaged elementary schools.²⁶

Children who lived in public housing and who attended schools where no more than 20 percent of students qualified for a free or reduced price meal did best. Study participants who attended schools where up to 35 percent of students qualified for a free or reduced price meal performed no better academically over time than public housing children who attended schools where over 35 percent of students qualified for a free or reduced price meal.

School-based economic integration had about twice as large an effect on low-income children's academic performance as did neighborhood-based economic housing integration.

Schwartz offers several caveats to her findings that limit their broader generalizability for education policy:

Narrow range in poverty concentrations among district's schools. With respect to school SES composition effects: fewer than 5 percent of schools had more than 60 percent of students from low-income families, and none had more than 85 percent in any year, making it impossible to compare the effects of low- or medium-poverty schools with truly high-poverty schools, where 75 percent to 100 percent of the families are low-income.

Possible self-selection concerns. While the study benefits from its natural experimental design (random assignment of all families on the local public housing authority waitlist), the analytic sample of 850 students arguably comes from a self-selected group of low-income families. For example, low-income families who live in an economically diverse suburban county like Montgomery County may differ from low-income families who live in a central city neighborhood. Thus, it is possible that the Montgomery County's integrative housing program promoted academic success for the kind of families in public housing that choose to live in a lower-poverty county (as opposed to a central city), and the factors related to that different residential choice may also be related to their children's school outcomes.

Not longitudinal. The study did not follow children through middle or high school, where there conceivably might be different effects on achievement from SES integration of schools over time.

²⁶ Schwartz, 2010, p. 5



FAIRFAX COUNTY, VA: In 2013, researchers in the Fairfax County, VA school system (FCPS) disseminated a study of school SES thresholds and student achievement. The study's goal was to find empirical evidence of a tipping point for FCPS, which the authors defined as “the level of school poverty at which success is statistically unlikely” for most students in that school. They conducted multilevel regression analyses using reading and mathematics pass rates on standardized test score data for FCPS elementary students in grades 3-6 collected at the end of the 2011-12 school year.

Two findings are noteworthy:

- Results revealed a demonstrable and specific link between overall poverty concentration in a school and a student's achievement in reading in grades 3-6. Follow up analyses found evidence of two thresholds in reading: a tipping point at 20% and 40-45% school poverty level. Schools

with greater than 20% poverty were less likely to meet performance expectations than those with less than 20%, and once school poverty levels reached 40% or more, schools were unlikely to meet performance expectations in grades 3-6. School poverty levels explained about 10% of the differences in elementary readings scores.²⁷

- Mathematics achievement data did not show a consistent or clear pattern between school-level poverty and mathematics performance in any grade. To be sure, mathematics performances varied among schools, but researchers found none of the variations in mathematics performance were related to overall poverty concentrations in a school.

The Fairfax County, VA report garnered significant publicity because it appeared to identify poverty thresholds that posed potential dangers from even modest efforts at SES integration. However, we should not ignore significant limitations of the study's reliability and validity, especially for generalizing beyond Fairfax County, VA. These limitations include a limited scope in terms of grade levels studied, subject areas tested, and the mixed result (e.g. threshold effects found for grades 3-6 in reading, but none found in math).

27 Fairfax County, 2013, pp. 2-6

CONCLUSION & RESEARCH RECOMMENDATIONS

CONCLUSION

Overall, I find that there is not yet a body of systematic, reliable, and valid evidence that school poverty thresholds exist, and that they influence student achievement outcomes. With few exceptions, such as Palardy's²⁸ suggestive threshold study and Schwartz's²⁹ quasi-experiment, the very small number of U.S. studies that report thresholds effects typically were conducted by a school district's internal staff using cross-sectional data (only one year) for a subpopulation of district's students (i.e., for students in some grades in some subjects at one point in time). Although the studies varied in quality, they all suffered from either research design, sample, or measurement problems that make it impossible to generalize from their findings to school systems elsewhere. Conclusions reached in these studies arguably apply only to the students in the district who took part in the study, in the year in which the data were collected, and only for the subject areas tested. In short, the studies described in this report are not an empirical foundation upon which general educational policy regarding SES thresholds can be reliably or validly based.

RESEARCH RECOMMENDATIONS

For the time being, then, educational leaders need not wait for evidence regarding SES thresholds to enact educational policies to reduce concentrated poverty in public schools. There is already an abundant empirical record supporting the enactment of policies that avoid assignments concentrating children living in poverty in the same schools. The best evidence available suggests school leaders should reduce poverty concentration to as low a level as is feasible given the available demographic mix. Furthermore, the preponderance of available evidence indicates that all students will benefit from such decisions.

While a suggestion that decision makers reduce school poverty concentrations to as low a level as possible captures the state of knowledge on the topic of this research brief, it begs the question of how—and to what extent—they can do this. Thus, this brief has identified two areas with gaps in research. The first gap concerns the state of knowledge on the possible existence of SES thresholds above and below which students' educational outcomes are affected. Future studies employing representative national

28 Palardy, 2008

29 Schwartz, 2010

samples of schools and students need to be conducted to establish whether or not thresholds exist; and if so, in which contexts they influence outcomes, in which subjects, for which demographic groups and grade levels. The second research gap concerns the present: what existing practices, policies, and programs have schools used to successfully reduce concentrated poverty as we currently understand the phenomenon?³⁰

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30 For some initial explorations of this question, see U.S. Department of Education, 2017 (available at <http://school-diversity.org/pdf/improving-outcomes-diversity.pdf>); Potter, Quick, & Davies, 2016 (available at <https://tcf.org/content/report/a-new-wave-of-school-integration>); Potter, 2016 (available at <https://tcf.org/content/commentary/updated-inventory-socioeconomic-integration-policies-fall-2016>); and Frankenberg, Anderson, & Taylor, 2017 (available at https://cecr.ed.psu.edu/sites/default/files/Voluntary_Integration_Research_Brief_0.pdf)

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