Article

Closing Poverty-Based Excellence Gaps: Conceptual, Measurement, and Educational Issues

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Abstract

The number of economically vulnerable students in the United States is large and growing. In this article, we examine income-based excellence gaps and describe recent controversies in the definition and measurement of poverty, with an eye toward their application to gifted education and meeting the needs of talented, economically vulnerable students. Regardless of how poverty is conceptualized, evidence suggests that U.S. childhood poverty rates are indeed high, both in absolute terms and relative to other countries, and that income-related achievement disparities are similarly large. Recommendations are included for interventions to close persistent poverty excellence gaps, including frontloading, broadened understanding of opportunity, universal screening using local norms, improved educator preparation and support, state K-12 accountability systems that reward schools for closing excellence gaps, widespread use of ability grouping, and selective use of psychosocial interventions at the college level.

Keywords

identification, assessment, policy/policy analysis, programming/service delivery models, low income, special populations/underserved gifted, teacher preparation/induction

Meeting the needs of economically vulnerable gifted students has been a concern within the field of gifted education for some time. Many early approaches to the topic involved a focus on promising practices (Bernal, 1976; Miley, 1975), such as career and occupational interventions (Henderson, 1966; Moore, 1978), teacher training on gifted students living in poverty (Gear, 1978; Torrance, 1974), and modifications to curriculum and instruction (Baldwin, 1978). The emphasis continues to this day, with many Javits Act projects focusing, at least in part, on the talent development needs of students living in poverty (e.g., 2015 Javits grants awarded to the Colorado Department of Education and the Utah State Office of Education; see National Association for Gifted Children, 2015).

At the same time, the study of poverty is marked by several recent conceptual issues and controversies. For example, how can and should practitioners and policy researchers define poverty? At what point on the family income continuum does "poverty" produce negative effects? Does a particular definition of poverty have implications for interventions? Although partly an academic exercise, the implications of these questions may have a significant impact on how society addresses poverty in educational settings—or if it does at all. For example, if a school seeks to close income-related excellence gaps through a specialized intervention or wants to use group-specific norms based on income for the purposes of student identification, then being able to accurately define and measure poverty is critical.

This example touches on distinctions between relative and absolute poverty, which is generally not well understood by education researchers. If the absolute standard is the percentage of people living on less than $1 per day, then the United States indeed has few poor people compared with other countries. But it is also true that $1 per day in rural China or Zimbabwe or Moldova has considerably greater purchasing power than $1 per day in Baltimore, rural West Virginia, or Los Angeles. For this reason, many researchers use a relative definition, such as family income being, for instance, less than 20% of the national average.

As a result of these issues, conceptualizing and measuring poverty is complex, controversial, and often misunderstood. In the following sections, we present data on poverty-based excellence gaps, review recent research on the effects of poverty, examine conceptual issues with the study of poverty in

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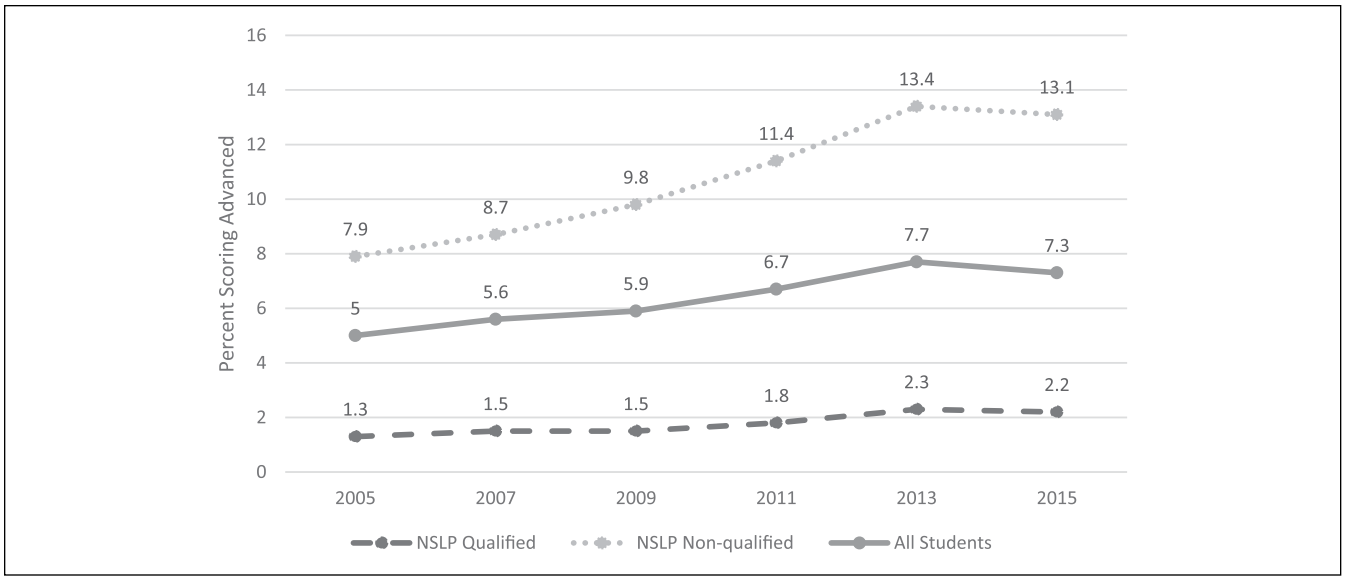

Figure 1. National Assessment of Educational Progress (NAEP) Grade 4 mathematics advanced scoring rates by lunch status.

education, and conclude with recommendations for meeting the needs of economically vulnerable gifted students.

Performance of Economically Vulnerable Gifted Students

Before examining data for gifted students, we note the United States shows some of the largest income-based achievement gaps in the industrialized world, with gaps operationalized as the difference between students scoring at the 90th and 10th percentiles for each income group. Chmielewski and Reardon (2016), using data from Programme for International Student Assessment (PISA), Progress in International Reading Literacy Study (PIRLS), and (for the United States) Early Childhood Longitudinal Program–Kindergarten (ECLS-K), showed that these gaps are in part due to very high levels of childhood poverty (the highest of any nation in their analysis) and very low levels of social welfare (the lowest of any nation in their sample). In a related vein, Warne, Anderson, and Johnson (2013) argue that the disparity in minority representation rates in gifted programs can be largely explained by America's large achievement gaps.

Very few low-income students, as identified by eligibility for the federal free/reduced-price lunch program eligibility, score at the advanced level on any national tests. For example, Figure 1 includes data on students scoring advanced on the National Assessment of Educational Progress (NAEP) Grade 4 mathematics assessment from 2005 to 2015, including estimates for all students and for those eligible for the National School Lunch Program (NSLP). Figure 2 presents the net difference in advanced scorers between students qualifying for the NSLP and those who do not.

Figure 1 shows that the number of advanced performers has increased over time, but that growth in advanced scorers among students who do not qualify for lunch assistance outpaced growth among qualifying students. Space limitations do not allow for inclusion of similar figures based on other grades and content areas, but the patterns are similar (Plucker, Hardesty, & Burroughs, 2013). The data in Figure 2 suggest that excellence gaps based on family income have also grown significantly over the same time period, and at all three grade levels tested. In math and reading, excellence gaps tend to be stark; in other content areas, the differences are significant but not nearly as large (i.e., usually because the top-performing subgroup does not perform at high levels). This probably is a result of the No Child Left Behind Act's narrowing of the curriculum and/or narrow focus on improving math and reading test scores (Beveridge, 2009; Fitchett & Heafner, 2010).

State data are also illustrative, especially because some states with relatively high rates of advanced students also have very large excellence gaps (Plucker & Peters, 2016). A good example is Massachusetts, a state that has experienced sharp increases in the percent of students scoring advanced on state assessments and NAEP—and among the highest rates in the country: NAEP Grade 8 mathematics advanced scorers increasing from 11.4% in 2005 to 18.2% in 2015. But at the same time, Massachusetts also suffers from some of the largest excellence gaps in the country; the lunch-status gap in Grade 8 mathematics has increased from 11.2% (14.6% for nonqualifiers vs. 3.4% for qualifiers) to 19.5% (26.6% vs. 7.1%). Massachusetts may be seeing more students scoring at advanced levels, but this growth has largely taken place among students who are not affected by poverty. This observation points to an all too common trend in gifted education—services offered under such an umbrella tend to show a far greater effect for higher income students, in part because they are much more likely to receive them.

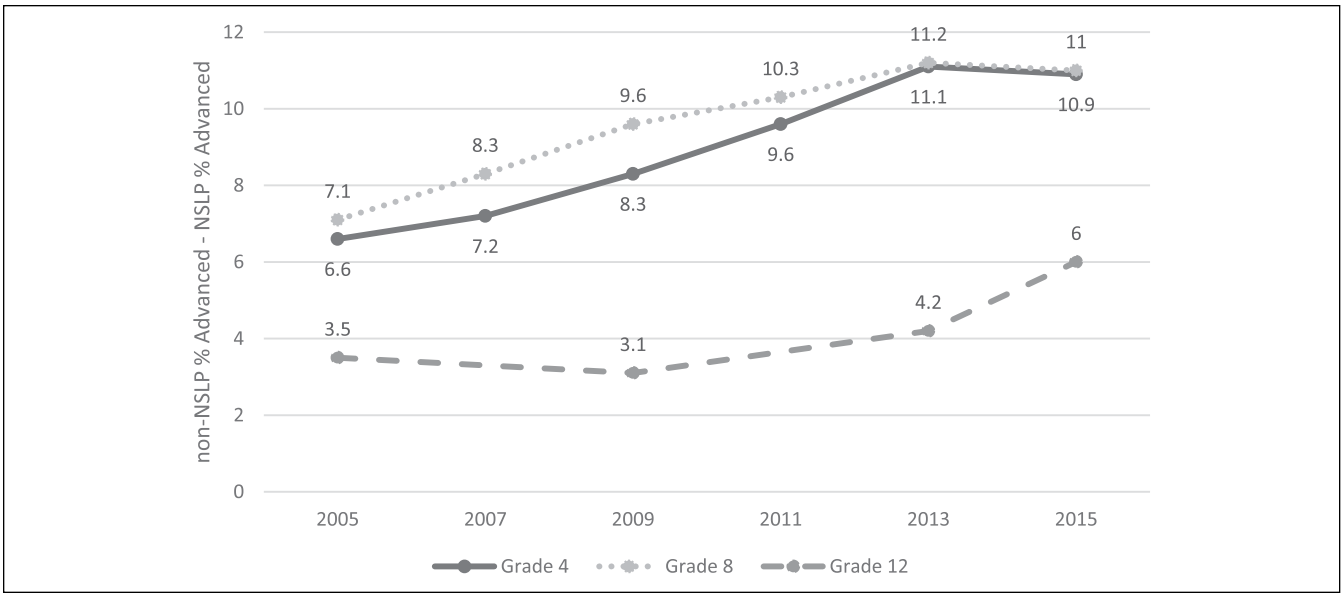

Figure 2. National Assessment of Educational Progress (NAEP) mathematics excellence gaps based on lunch status.

Data on international excellence gaps is less plentiful, with most recent research occurring in the United States and United Kingdom. Rutkowski, Rutkowski, and Plucker (2012) used Trends in International Mathematics and Science Study (TIMSS) data from 82 education systems and found evidence of shrinking gender excellence gaps and persistent but small immigration excellence gaps (e.g., academic performance of immigrant vs. nonimmigrant students). To date, little research appears to have been conducted on excellence gaps across countries based on student socioeconomic status (SES), in part because of the challenges regarding the use of comparable metrics of poverty across national borders.

Finn and Wright (2015) took a different approach to study comparative excellence gaps. Using PISA data, they compared the percent of high scoring students from the top and bottom quartiles of SES, as measured by PISA's Index of Economic, Social, and Cultural Status. They found a clear relationship between the percent of poorer versus wealthier students who score at high levels, and they used these data to calculate a ratio of high-SES advanced performers to low-SES advanced performers. For their selected countries, ratios ranged from 2.9:1 to 18.0:1, with smaller ratios representing smaller socioeconomic excellence gaps. Unfortunately, the United States had a higher ratio than all but Hungary in math and reading, and only Hungary and Taiwan had higher ratios in science. Not only do excellence gaps exist in every country, but the available evidence suggests they are much larger in the United States than in most other, developed countries.

Effects of Poverty

These persistent excellence gaps are not surprising given the widely documented effects of poverty. Scholars have noted a wide range of effects of poverty and low income on students, their families, and their communities. Research suggests that most aspects of children's physical, cognitive, and affective health and development are affected by poverty, primarily due to the effects of deleterious environments, lack of access to quality education and other human services, and lack of resources (Hill & Sandfort, 1995; Odgers & Jaffee, 2013). Several recent studies suggest impoverishment is also debilitating in a number of unexpected ways. As children move into adulthood, negative effects include problems with economic productivity, health, personality, and even cognition (Chou, Parmar, & Galinsky, 2016; Duncan, Ziol-Guest, & Kalil, 2010; Gilman, Kawachi, Fitzmaurice, & Buka, 2002; Lee et al., 2015; Spencer, Thanh, & Louise, 2013; Staff et al., 2012; Sturge-Apple et al., 2016).

Recent neuroscience research suggests that the effects of poverty hit early and hit hard. For example, the relationship between poverty and negative aspects of brain development has been documented (Hair, Hanson, Wolfe, & Pollak, 2015; Kishiyama, Boyce, Jimenez, Perry, & Knight, 2009; Lawson, Duda, Avants, Wu, & Farah, 2013; Noble et al., 2015), with researchers finding significant, negative impacts of poverty on brain development among children before they enter kindergarten (Luby et al., 2013) and even in the first year of life (Tomalski et al., 2013). Given all of this research, the fact that economically disadvantaged children grow up into adults that are disproportionately subject to negative health, educational, and criminal justice outcomes is not surprising (see Caspi et al., 2016).

The accumulating evidence on the negative influence of poverty leaves us wondering if any gap elimination intervention can be successful absent a serious effort to mitigate the effects of poverty. For example, Hill, Prokosch, DelPriore,

Griskevicius, and Kramer (2016) found evidence that childhood SES is related to the adult desire to eat when needed; people who grew up in relatively high SES tended to eat more often when they had high energy needs and less often when they had low energy needs; participants who grew up in lower socioeconomic circumstances tended to eat at high levels regardless of energy need. This, in turn, leads to higher rates of chronic health problems such as obesity and diabetes. Regardless of the specific outcomes, the research literature provides ample evidence that growing up economically vulnerable has lasting effects into adulthood, *even if the adult is no longer economically insecure*. These numerous and wide-ranging effects negatively influence achievement, including excellence gaps; although excellence gaps probably do not lead to further negative effects due to poverty, they certainly do not help alleviate those effects.

Race Versus Poverty in Identification, Programming, and Data Reporting

Another complication that is relevant to the current analysis is that much education policy—and many related policy debates—focus primarily on race and ethnicity at the expense of economic vulnerability. This focus is understandable given the country's long, troubled history of racial and ethnic discrimination, but although some racial and ethnic groups are more likely to experience poverty than others, economic vulnerability is experienced by all racial and ethnic groups, although to varying degrees (Kneebone, 2014). For example, the U.S. Census estimates that 32% of Hispanic children younger than 18 years lived in poverty in 2013, but with considerable variation based on national heritage (i.e., 23% for Cuban students vs. 35% for Dominicans) and family structure (22% for Hispanic children living with both parents vs. 50% for children living only with their mother).[1] In other words, socioeconomic insecurity is often correlated with other demographic characteristics, but those correlations do not explain all of the variance, and correlation should not be inferred to represent causation. Instead, poverty and race tend to covary with other factors that do influence educational achievement such as student health, school quality, and access to supplementary educational resources (see Espinoza-Herold & Gonzalez-Carriedo, 2017; Hernandez & Pressler, 2014; Penner & Saperstein, 2013; Vaughan, Rosenberg, Shouse, & Sullivan, 2014). Looked at from a different perspective, if poverty were completely eradicated, racial differences would still exist in student outcomes due to the effects of discrimination.

At the same time, educators and policy makers need to acknowledge the substantial overlap between race/ethnicity and SES. This correlation has important and somewhat severe implications for public schools; Black, Hispanic, and American Indian students tend to be concentrated in high poverty schools; few Black, Hispanic, or American Indian fourth graders attend public schools where 10 percent or less of the student body qualifies for lunch assistance. Over half of Hispanic students attend schools with more than 75% of the students on lunch assistance. The pattern for White and Asian students is very different, with 71% and 65%, respectively, attending schools with 50% or fewer of the students qualifying for lunch aid (Plucker & Peters, 2016). This concentrated poverty results in a kind of multiplier effect. Whereas being economically vulnerable has its own set of challenges, when everyone around you is also economically vulnerable, these challenges are exacerbated.

Definitions of Poverty

The United States is among the richest countries in the world yet has one of the poorest populations. Data from the U.S. Census provide evidence that more than 45 million Americans live in poverty, representing 14.5% of the population. Although this poverty rate is not exceptional (similar rates were experienced in the early 1980s and 1990s, and rates were historically much higher prior to the implementation of Social Security and Great Society social programs in the 1950s and 1960s), population growth has led to larger numbers of Americans living in poverty today than at least since the 1950s (DeNavas-Walt & Proctor, 2014).

Poverty rates for children 18 years old or younger have dropped slightly during the current economic recovery, currently standing at 21.1%, representing over 15 million children (DeNavas-Walt & Proctor, 2014). This rate is one of the highest in the developed world (UNICEF Innocenti Research Centre, 2012). The National Center for Children in Poverty estimates that 11% of U.S. children aged 0 to 9 years live in deep poverty, living in families earning less than half the federal poverty level (Ekono, Yang, & Smith, 2016).

Nearly 10% of households (3.8 million households) experience some degree of food insecurity, defined as a lack of "access at all times to enough food for an active, healthy life for all household members" (Coleman-Jensen, Gregory, & Singh, 2014, p. i); these household data translate to over 8.5 million children experiencing some degree of food insecurity in 2013. Terms such as low income, poverty, food insecure, and many others are often used interchangeably even though they are operationalized and defined differently. They also assume that people not classified as being in any of these groups do not experiences the challenges related to financial or economic challenges, assumptions that are not as safe as they might seem.

Over the past generation, the percent of K-12 students qualifying for free or reduced-price lunch programs, one of the most widely used metrics of low-income status, has substantially increased. For the 2012-2013 school year (the latest available data), 51.3% of students qualified for these programs, meaning that over half of our public school students live in households whose income is 1.85 times the poverty level or less. For a family of four this means an income of slightly less than $50,000 a year. That rate is up from

49.6% in 2011-2012, continuing the trend since the last economic crisis of a roughly 1.5% annual increase. In 22 states (plus the District of Columbia), over half of the student population qualifies for lunch assistance (up from 18 the year before), with over 60% qualifying in 9 of those states and the District of Columbia (up from 5 the previous year).[2] Childhood poverty and, more broadly, economic insecurity are increasing.

However, these statistics mask a number of important complexities related to measuring poverty, and as a result, determining its impact on children and families. Poverty is not easy to define, and measuring it is not without considerable controversy, both regarding national and global estimates (Anand, Segal, & Stiglitz, 2010). Some U.S. databases estimate poverty based on whether students are qualified to participate in free or reduced-price lunch programs, but the issues of using this data point as a measure of poverty are well-documented (Harwell & LeBeau, 2010; Snyder & Musu-Gillette, 2015). For example, researchers have found evidence that a family needs resources at least twice the federal poverty level to meet basic needs (Cauthen & Fass, 2008), making even the lunch assistance level a conservative estimate of economic insecurity. Other databases simply do not have any indicators of family economic well-being, further complicating matters. And some students who qualify for free or reduced-price meals do not experience the factors associated with poverty for a variety of reasons, and even some seemingly wealthy people might still experience financial challenges.

For example, 25.2% of children living in households at or below the poverty line are estimated to experience food insecurity. In households with income-to-poverty ratios of 1.85 or lower (the cutoff for free or reduced-price lunch), food insecurity rates are not terribly dissimilar at 21.5% (Coleman-Jensen et al., 2014). For these reasons, we use the term "economically vulnerable" to describe students who deal with the myriad issues faced by individuals experiencing a lack of socioeconomic security in the United States.[3] In the data provided below, we use lunch program qualification as a proxy for economic vulnerability, as it is the only relevant indicator available in the data sets of interest.[4]

Recent Controversies

The impetus for the recent controversy about poverty rates was two articles by Petrilli and Wright (2015, 2016) in which they argued that research saying the United States has a very high childhood poverty rate compared with other countries, such as the UNICEF report cited earlier, exaggerate the magnitude of U.S. child poverty. They sharply criticize the use of a relative poverty definition when calculating these rates, with poverty often defined in such approaches as earning less than half the median salary in a given country. From their perspective, when comparing countries, "Many of the U.S. households that are counted as poor on a relative measure would be considered middle class on an absolute measure." They provide data suggesting that U.S. poverty, when estimated in absolute terms, is fairly typical for a developed country.

The response to these arguments was intense, with many counterarguments that the original analysis had itself made too many assumptions about the relative versus absolute poverty distinction. For example, Bruening (2015) noted that the local economic context matters: If you use absolute poverty estimates, you have to factor in the cost of goods within each economy. And many countries have social services for the poor that do not involve cash transfers or other direct benefits (which Petrilli and Wright included in their calculations), such as free health clinics and other social services that are not as widely available to economically vulnerable children in the United States. Using an approach that accounts for purchasing power within each country, Bruening found that disposable income for households with children, even when using the absolute poverty approach, was among the lowest in the developed world. By way of illustration, at the 5th percentile of per capita income, children in poor Norwegian families have 97% more per capita disposable income than children in similar American families, in large part because of a wide array of public social safety supports that are provided.

The United States clearly has a large number of economically vulnerable children (probably more than other rich countries, in both relative and absolute terms), and those children rarely excel academically. That said, one aspect of the Petrilli–Wright argument that was largely lost in the heated debate is their argument that relative poverty rates are a better indicator of income inequality than absolute poverty, and that we need to focus on income inequality just as much poverty. Growing income inequality certainly needs more attention in American public policy debates, and discussions over how best to address excellence gaps are no exception.

Role of Government Social Programs

Compared with other developed countries, the United States spends far less as a percentage of GDP on aid for the poor (Organisation for Economic Co-operation and Development [OECD], 2012; UNICEF Innocenti Research Centre, 2012). The OECD, in an analysis of the influence of tax and transfer policies on income inequality and growth, grouped the United States with Chile, Israel, Mexico, Portugal, and Turkey as countries

> characterised by above average inequality originating from the labour market. . . . Capital and self-employment income also tend to benefit a small group of households. Cash transfers have little redistributive impact because they are small in size and often largely insurance-based. . . . Overall, for these nations both inequality in household disposable income and the poverty rate are well above the OECD average. (OECD, 2012, p. 9).

Indeed, Plucker and Peters (2016), in the review of research on causes of excellence gaps, found few arguments that high U.S. poverty rates were *not* a function of our economic and social policies. All of these analyses suggest that growing income inequality and high childhood poverty rates are not an inevitable part of the American experience. And there is recent historical precedence for the belief that poverty can be directly addressed in a big segment of the U.S. population. For example, without social security, nearly half of seniors would live in poverty, versus the reality of 10% today (Lindsey, 2008). Growing old in America used to correlate highly with dying in poverty, but social security and other social safety net programs greatly improved the lives of older Americans. Similar progress has not been made, especially over the past few decades, in reducing child poverty. Compare the sharp reduction in senior poverty from the mid-1960s to today (about 28% to 10%) with the change in the childhood poverty rate over the same time period (from about 20% to 21% today: DeNavas-Walt & Proctor, 2015). Poverty reduction among seniors is unquestionably one of the country's biggest public policy accomplishments; lack of poverty reduction among children is one of our biggest public policy failures (Lindsey, 2008). This inability to reduce poverty and, more specifically, the negative effects of poverty, is a direct barrier to the elimination of income-based excellence gaps and, therefore, both economic development and social justice.

Implications for Gifted Education

Identifying causes of poverty excellence gaps is straightforward, but finding promising strategies for shrinking these gaps is a much more difficult task. This difficulty is due to the fact that recommendations abound, but research support for various strategies is remarkably thin. For example, Plucker and Harris (2015) recently reviewed research on the use of acceleration strategies with economically vulnerable students. They found numerous suggestions that acceleration *could* be an effective intervention for closing poverty-based excellence gaps (e.g., acceleration strategies via distance education), assuming the interventions do not rely on resources in the students' often poorly resourced schools (see also Hebert, 2002). But the actual empirical research on many of these strategies is thin.

For example, some acceleration options may involve a need for transportation, yet economically vulnerable students may not have access to easy or reliable transportation beyond their neighborhood (Andersson, Haltiwanger, Kutzbach, Pollakowski, & Weinberg, 2014; Kneebone, 2014). Plucker and Harris (2015) also cautioned that there are legitimate questions about whether certain strategies can work with this population of talented students. Recent research provides evidence that many students attending high poverty schools do not have many of the technological skills necessary to benefit from internet-delivered programs (Leu et al., 2015). Much of this research has been conducted with mixed ability populations, making it difficult to determine the extent to which the many debilitating correlates of poverty (e.g., lack of access to reliable transportation, healthcare, well-resourced schools, and technology) affect the use of acceleration and other interventions with economically vulnerable students (Leuven, Lindahl, Oosterbeek, & Webbink, 2010).

Excellence Gap Intervention Model

In order to identify specific strategies for closing poverty-based excellence gaps, Plucker and Peters (2016) conducted a review of the available research and proposed an excellence gap intervention model. The six sets of interventions in the model include realistic opportunities, universal testing and local norms, ability grouping, K-12 accountability systems, educator preparation and support, and psychosocial interventions. The interventions, which cross levels of education and policy and are not meant to be exhaustive, represent promising practices for shrinking excellence gaps. We envision these interventions being used comprehensively and not in a piecemeal fashion. Indeed, a P-20 approach to service delivery for talented, economically vulnerable students, in which a comprehensive and seamless set of services are provided for these students from preschool through college graduation, would appear to be a wise approach, given the potential for these students to get "lost in the cracks" during transitions between educational levels (Chamberlin & Plucker, 2008; Roberts, 2008).

A reviewer of an earlier draft of this article challenged us to define our target population more clearly, asking if, in our discussion of the following model, we are targeting poor students identified as gifted; talented, poor students who are unidentified due to school resource issues or being judged against national norms; or all students living in poverty. This is a fair question, and our response is that we are focused on all economically vulnerable students with the potential to perform at the highest level of achievement. As noted earlier in this article, the research provides evidence that these students are (a) not performing at advanced levels at nearly the level that can be reasonably expected, (b) not receiving adequate services to develop their talents, and (c) not being identified for services when such services exist.

All components of the intervention model assume considerable frontloading on the part of educators (i.e., essentially making frontloading the foundation on which the six other intervention strategies rest). For the purposes of this article, frontloading represents deliberate strategies used to help prepare students for challenging opportunities, some of which they may not face for years. Frontloading is focused on students who are not on the typical trajectory to need, benefit from, or be identified for advanced programs and helps them explicitly prepare for such opportunities and interventions. A classic example of the dangers of a lack of

frontloading is Advanced Placement (AP) incentive programs. With the best of intentions, policy makers around the country implemented AP incentive programs that expanded the number of schools offering AP coursework and covered the cost of taking AP tests. On their surface, this type of program appears to be a thoughtful excellence gap intervention. But without frontloading—preparing students in middle school for the rigorous AP curricula—students will not thrive in the AP program.

Unfortunately, poor results for underserved and minority students became the norm for AP incentive programs, resulting in calls by Loveless (2016) and others for educators to pay more attention to preparation for AP coursework well before students enter high school. Plucker and Peters (2016) provide examples within the AP context of successful frontloading efforts, suggesting that frontloading is both necessary and achievable. Perhaps the most notable of these programs is The College Board's (2011) SpringBoard program, which specifically addresses frontloading for future AP course participation and test taking. In other words, educators need to provide necessary supports and academic rigor as early as possible in students' schooling in order to increase their chances of succeeding in advanced learning opportunities in high school and college.

Realistic Opportunities

The three keys to opportunity for advanced learning are successful communication, belief and acceptance, and low barriers to access (Plucker & Peters, 2016). If an opportunity for developing the talents of students exists, the students and their caregivers need to know the opportunity exists, they need to believe they should be taking advantage of the opportunity, and they need a realistic chance of accessing the opportunity. Each of these three criteria are necessary but not sufficient for an opportunity to move from being a well-intentioned idea to a tangible benefit for talented students.

For example, poor students with scientific talents and interests will not participate in a weekend or afterschool science enrichment program if they do not know about it, if the program charges a fee the students cannot afford, and if the students' caregivers do not understand and value the opportunity for their students. At the same time, opportunities are much more likely to be realized by economically vulnerable students if the programs are well-communicated to families of all potentially eligible students, have few barriers to entry (e.g., no registration or materials fees, no transportation required of participating families), and are described to the caregivers in ways that convince them of the value of the activity for their child are much more likely to be realized.

Every Student Succeeds Act (ESSA) specifically states that Title I funds can be used for the identification and education of advanced learners. Without proactive support of this new flexibility in Title I, districts are likely to continue to use the funds solely for struggling learners. If, instead, a state takes on the issue of encouraging districts to include attention to advanced learners and providing ideas and suggestions for what that might look like, these efforts could be used to address excellence gaps. State education agencies should modify their application processes for Title I funds in order to make it clear that such funds can be used for advanced learners, especially those from underrepresented populations.

Universal Testing and Local Norms

Nonuniversal screening for talent will leave many students out, and those students will be disproportionately from underrepresented populations (Grissom & Redding, 2016; McBee, 2006; McCoach, Siegle, Callahan, Gubbins, & Hamilton, 2016). A clear implication is that whenever possible, assessments or systems used to identify talent should be administered universally to all students under consideration (Card & Giuliano, 2015; McBee, Peters, & Miller, 2016; Peters & Engerrand, 2016). This could take the form of testing or observing all second grade students instead of only those who received a teacher recommendation. This will involve some increased time and money, but it will also mean the fewest students from low-income or minority families are missed. This is one of the clearest action steps that gifted or advanced programs should take.

An additional benefit to universal screening is that it facilitates the use of local norms, given the availability of data on all students (Peters & Gentry, 2012). Using local norms moves the comparison group from the students across the nation (national norms) or within the state (state norms) to a particular student's school or district peers. In high poverty schools, using national or state norms tends to produce identified student populations that are not representative of the school or district population, whereas the use of local norms tends to identify more students from underrepresented groups, such as economically vulnerable students (see Brody, 2015, for negative implications of using national norms in economically diverse districts). Implementing local norms would increase the number of identified advanced learners in the schools with the largest numbers of low-income and minority students. Of course, simply identifying them is not likely to have much of an effect on their learning, but if they are identified and then provided with additional support, local norms could have an effect on excellence gaps.

If districts want to close excellence gaps, district staff need to proactively seek out students of potential who also come from low-income or minority families. Universal screening and local norms may help, but additional efforts such as group-specific comparisons and allowing teachers to recommend students into certain programs even if the student's test scores are not particularly high. That said, such proactive identification cannot be implemented in isolation. Students who are identified via alternative criteria need to be provided additional support in order to be successful. Mentoring, tutoring by

older peers from similar communities, or additional support from school staff need to all be considered. For any modified or proactive identification system to be successful, curriculum supports need to be modified or expanded as well.

Ability Grouping

Although often unpopular because of its association with tracking, ability grouping has been shown to increase the number of underrepresented students identified as high achieving over time (e.g., Card & Giuliano, 2014; Gentry, 2014; Robinson, 2008). The hypothesized mechanism for these effects is that grouping strategies tend to narrow the range of achievement that any single teacher is expected to instruct in a general classroom setting (see Firmender, Reis, & Sweeny, 2013; Peters, Rambo-Hernandez, Makel, Matthews, & Plucker, 2017), although Rogers and Feller (2016) have recently provided evidence that minimizing peer comparisons between low- and high-performing students may also facilitate positive grouping benefits.

K-12 Accountability Systems

Most states will be rethinking their K-12 school accountability systems over the next few years. They generally tinker with their systems routinely, but ESSA has important implications for those systems that will encourage and allow for major retooling. Accountability systems have a demonstrable effect on education policy and student outcomes, yet few states have much in the way of excellence indicators in their systems' data points (Petrilli, Griffith, Wright, & Kim, 2016; Plucker, Giancola, Healey, Arndt, & Wang, 2015). Adding such indicators would send an important message that advanced learning and growth for all students is important and obtainable for all K-12 public school students.

Some states, such as Wisconsin, now include points derived from schools' ability to "close gaps" on their school report cards. However, evidence suggests that closing excellence gaps is not included in most state accountability systems (see also Petrilli et al., 2016). Instead, only minimal proficiency gaps allow schools to earn credit for their efforts toward equity. Changing state policies to allow for excellence gap closure to be included on school report cards would allow schools to devote resources (such as the Title I and Title II funds now allowed to be used for advanced learners) to receive credit for their work toward greater equity in this area. If a local school community is seeing talents in their low-income, African American, Native American, or Hispanic students going underdeveloped, they should not be penalized with funding and opportunity costs for devoting money and effort to addressing this issue.

Educator Preparation and Support

The federal Higher Education Opportunity Act (HEOA) was signed into law in summer 2008 (HEOA, PL110-315). This law made three substantive changes regarding teacher training in the United States. First, it required teacher-training programs to instruct their students in the identification of student learning needs, including those of advanced learners. Second, it required that teacher-training programs instruct their students in how to differentiate instruction for advanced learners and otherwise meet their learning needs. And third, it required that the state report cards on the quality of teacher training programs include criteria on how the earlier two requirements were being addressed and evaluated. If all states and teacher training programs had indeed done all of this, every teacher who completed his or her program over the past 5 to 8 years would have received some training regarding how to challenge advanced learners. Unfortunately, most state reporting makes very little reference to how teacher-training programs are evaluated to assure their candidates are being appropriately training with regard to the identification and instruction of advanced learners. Few states require specific coursework in teacher training programs (National Association for Gifted Children & Council of State Directors of Programs for the Gifted, 2015; Plucker et al., 2015). All of this points to a relatively easy recommendation for states to implement: Enforce the HEOA requirements related to advanced learners.

If states want to address the low overall rates of advanced achievement or specifically excellence gaps, they should require teacher preparation programs within their state to follow the lead of the Javits program at the federal level. This would involve requiring teacher training programs to include content on how to identify when students are being under challenged, how to differentiate curriculum in order to better meet their needs, how to implement student acceleration processes, and how to support underrepresented learners in their work toward advanced achievement. In our experience in teacher education, advanced learners tend to receive one or two lessons of attention, *at most*, within a larger class about special education. With this as the state of affairs, it should be no surprise that teachers focus more of remediation than on developing excellence.

ESSA requires that any state and district that accepts Title II money must report on how those funds were used to increase the capacity of teachers to reach all students. Importantly, the definition of "all students" specifically includes gifted and talented students. If states want to address excellence gaps, they could proactively enforce this requirement or even focus a state priority on the closure of excellence gaps through staff professional development. Unlike with HEOA where the mandates were weakly enforced (at best), states could implement extensive oversight to Title II funds to make sure that they are being used to develop educator ability to reach *all* students. For example, a district could train its teachers in the use of the Mentoring Mathematical Minds curriculum for high potential English Language Learners (Cho, Yang, & Mandracchia, 2015; Gavin et al., 2007). Similarly, a district could seek to expand the pre-AP programs for low-income students in

order to close excellence gaps and increase overall rates of achievement. A range of options are possible if a state takes on this issue as a priority with its Title II funds. Since most states are just beginning to determine how the ESSA rules and requirements will be implemented, this seems like the perfect time.

As we noted earlier, K-12 educators are rarely required to take coursework on the needs of gifted students in their preservice preparation programs (Plucker et al., 2015). This lack of exposure to the needs of advanced students and lack of preparation for meeting those needs puts a large burden on K-12 schools to address these deficits via professional development. Fortunately, the availability of Title II funds for this purpose provides an avenue through which all schools can provide professional development opportunities for their leaders and educators about meeting the needs of economically vulnerable, talented students.

Psychosocial Interventions in College

Plucker and Peters (2016) found little evidence to support the use of psychosocial interventions, such as interventions focused on improving student grit and mindset, to close K-12 excellence gaps (e.g., Cohen, Garcia, Apfel, & Master, 2006; Cook, Purdie-Vaughns, Garcia, & Cohen, 2012; Nguyen & Ryan, 2008), although they found the research on the impact of stereotype threat interventions on college excellence gaps to be promising (Good, Aronson, & Harder, 2008; Walton & Cohen, 2011). These interventions are also brief and cost effective, suggesting that they can be applied widely. Any comprehensive approach to addressing excellence gaps needs to consider the role of psychosocial interventions at the college level.

Recommendations for Future Research

Although researchers, educators, and policy makers are gaining a deeper understanding of economic vulnerability, its many pernicious effects, its impact on excellence gaps, and strategies for addressing those gaps, a great deal of work remains.

Specifically focusing on talent development and gifted education, the field needs more evaluations of individual interventions, but an emphasis on *comprehensive* interventions that tackle the complexities of economic vulnerability would be especially helpful. In this vein, one possible direction for future research is to investigate whether the growing number of community schools, largely located in impoverished urban areas, are having a positive impact on income-related excellence gaps. If so, and assuming these schools do little else to develop talent (which is fairly common in urban districts), any positive benefit from the community school model would provide evidence that alleviating the effects of poverty helps address excellence gaps—even in the absence of educational interventions. At the same time, a lack of progress in shrinking the gaps (or perhaps even if they grow) would suggest that poverty reduction alone is insufficient to raise the achievement of talented, disadvantaged students. And additional research on the excellence gap intervention model would help determine if the best practices identified in the research literature reduce or eliminate income-based excellence gaps in a range of educational and societal contexts.

In addition, future research on poverty and gifted students should be sensitive to recent advances in the measurement of poverty and economic vulnerability. For example, Michelmore and Dynarski (2016) provide evidence that assessing persistent economic insecurity (i.e., students who are routinely qualified for lunch assistance vs. those who intermittently qualify) is a good proxy for family income. Ensuring our measures of poverty—and giftedness and talent, for that matter—are reliable, valid, and constantly improving will help provide the solid research needed to support work in this area.

Despite the large volumes of needed research, we see reason for optimism. Plentiful research is available on the extent, causes, and implications of poverty in general, and a number of well-considered and well-researched interventions are available—including within gifted education. And research is beginning to find evidence that even small poverty-focused interventions can make a big difference, such as the Noble et al. (2015) study that found large improvements in brain development among poor students with even small increases in family income. The question is no longer *How big are poverty excellence gaps?* and we are quickly learning how to answer the question *How can we shrink these gaps?* In the near future, the primary question of interest will become *Do we have the will to eradicate these gaps once and for all*?

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Notes

1. See http://nces.ed.gov/programs/digest/d14/tables/dt14_102.60.asp
2. See https://nces.ed.gov/programs/digest/d14/tables/dt14_204.10.asp?current=yes. All data in this paragraph are drawn from the same source.
3. During work on related projects, our colleague Prof. James Moore suggested the use of this term, and we use it throughout this article. For stylistic reasons, we do occasionally use poverty and economic vulnerability interchangeably to avoid repetition of the longer term.
4. In our experience, schools are becoming increasingly reluctant to share data related to free or reduced-price lunch status over

student privacy fears. Although these fears may be warranted, making economic data even harder to access is not going to help address the challenges associated with family poverty and will complicate any efforts to better develop talent within this population.

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