Egalitarianism and Educational Excellence: Compatible Goals for Affluent Societies?

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Explanations for U.S. students' performance on international comparisons of educational achievement abound, with much of the scholarly and public discussion centering on cross-national differences in education systems. The author argues that the connection between economic inequality and educational achievement in affluent societies deserves far more attention than it receives. Analyses of data from the 2006 Programme for International Student Assessment and other sources indicate that egalitarian countries have higher average achievement, higher percentages of very highly skilled students, and lower percentages of very low-skilled students than do less egalitarian countries. These patterns suggest that egalitarianism and educational excellence are compatible goals for affluent societies. The author discusses the implications of these findings for educational and economic policy in the United States.

Keywords: achievement; comparative education; social stratification

The United States is one of the most affluent countries in the world, yet U.S. students' average achievement tends to lag behind that of students in many other affluent countries. How can this be? To date, much of the research and public discourse on this question has centered on cross-national differences in education systems, shedding light on how the United States differs from other countries in classroom climate, curriculum, access to high-quality teachers, and so forth (Akiba, LeTendre, & Scribner, 2007; Baker, 1993a, 1993b, 2003; Kang & Hong, 2008; Westbury, 1992, 1993). Yet the United States differs from other affluent countries in a crucial way that has received less attention: It is the most *economically unequal*. That is, income and wealth are more unevenly distributed in the United States than in any other affluent society (Smeeding, 2005; Wolff, 2002).

How might this high inequality help us to understand U.S. students' low educational achievement in cross-national perspective? In this article, I explore the relationship between economic inequality and achievement in the world's most affluent countries. After discussing the potential impact of economic inequality on societies' capacities to produce very high and very low achievers, I present the results of analyses using data from the 2006 Programme for International Student Assessment (PISA). I conclude by discussing implications for economic and educational policy in the United States.

Is There an Equality–Achievement Trade-Off?

Patterns of educational achievement in contemporary affluent societies are embedded in economic systems that produce varying degrees of inequality. In *egalitarian capitalism* (Kenworthy, 2004), for instance, government policies maintain a relatively low level of economic inequality; in *laissez-faire capitalism*, to varying degrees, there are fewer regulations and typically a higher level of inequality. The United States saw a period of egalitarian capitalism that began with the New Deal and ended in the early 1970s, when four decades of declining income inequality gave way to more than three decades of increasing income inequality (Massey, 2007). In the United States today, income inequality is as high as it has been since the eve of the Great Depression (Massey, 2007) and higher than in any other affluent country in the world (Pontusson, 2005). The comparison is very similar with regard to wealth inequality (Wolff, 2002). The United States is unique in these ways. Most other affluent societies tax and redistribute income and wealth to a greater extent, thereby maintaining lower levels of inequality and poverty and providing more expansive social safety nets for their citizens (Smeeding, 2005).

A common critique of egalitarian capitalism posits that high levels of taxation and redistribution harm capitalist economies in various ways, such as by inhibiting economic growth, increasing unemployment rates, and lowering the incomes of those near the bottom of the distribution. In response, Kenworthy (2004) systematically analyzed longitudinal data on affluent countries to assess whether efforts to promote greater equality necessitate these three trade-offs. He concluded "that low income inequality can be sustained and that it need not severely impede the growth of economic output, employment, or living standards for those at the bottom of the distribution" (Kenworthy, 2004, p. 146). In his research, Kenworthy found no evidence of an equality–growth trade-off or of an equality–incomes trade-off. The evidence did suggest that egalitarian capitalist economies have lower employment rates, which prompted Kenworthy (2004) to emphasize the importance of achieving "employment-friendly egalitarianism" (p. 147). Other scholars, similarly, have concluded that low inequality does not harm an economy (see

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Fischer et al., 1996; Pontusson, 2005); and some evidence suggests that "it is now possible to have *too much* [emphasis added] inequality from the point of view of maximizing economic growth" (Breen, 1997, p. 444). What does all of this have to do with educational achievement?

Economic inequality has a tremendous impact on educational opportunities and outcomes. For individual students, growing up in an affluent family provides many advantages in both school and nonschool environments in comparison with growing up in a poor family, advantages that contribute to a gap in academic skills (Berliner, 2006; Condron, 2009; Lareau, 2002; Marks, Cresswell, & Ainley, 2006; Payne & Biddle, 1999; Rothstein, 2004). This gap is present even before children begin formal schooling (Lee & Burkam, 2002), and as the years unfold it grows larger, primarily during the summers, when schools are not in session (Alexander, Entwisle, & Olson, 2007). Indeed, U.S. children spend far more time in their economically unequal nonschool environments than they spend in schools (Downey, von Hippel, & Broh, 2004). Given the important impact that economic inequality in students' nonschool environments has on academic skills, it follows that *societies*' levels of economic inequality could have an important impact on their students' performance in international comparisons of skills. But how? Countries with high average achievement tend to be more egalitarian than the United States (e.g., Finland), but is there a systematic relationship whereby egalitarianism correlates with high average achievement? If so, should we be concerned about a potential compromise or trade-off in which egalitarian societies produce fewer very highly skilled students?

Scenario 1: Equality–Achievement Trade-Off

It could be that when egalitarian societies invest resources—(re)distribute economic resources such as income and wealth—they bring up the bottom of the skill distribution at the cost of bringing down the top. Relatively equal investment in students spanning a short economic ladder, although it may help produce higher achievement at the bottom, could come at the cost of limiting opportunities at the top. In this equality–achievement trade-off scenario, egalitarian societies might miss out by producing fewer very highly skilled students who will go on to contribute important innovations in science, medicine, technology, and so forth. Average achievement may be similar to or even higher than that in less egalitarian societies, but producing fewer very highly skilled students could be an important concern. In contrast, less egalitarian societies might (re)distribute resources such that they raise the top of the test-score distribution but lower the bottom. Unequal investment in students spanning the taller economic ladder, although it may limit opportunities at the bottom, could help produce higher achievement at the top. Average achievement may be similar to or even lower than that in egalitarian societies, but producing more very highly skilled students could be an important benefit for less egalitarian societies.

Scenario 2: Achieving Compatible Goals

In contrast, economic inequality and achievement could be related in quite a different way. The preceding discussion gave high inequality the benefit of the doubt, but what if there is not an equality–achievement trade-off in egalitarian countries? What if, instead, egalitarianism and educational excellence are compatible goals for affluent societies?

It is reasonable to suspect that egalitarian societies produce just as many very highly skilled students as less egalitarian societies. Some studies have suggested that economic resources have "diminishing marginal returns" for achievement; in other words, that the impact of economic resources is weaker at higher levels of affluence than at lower levels (Chiu, 2010; Chiu & Khoo, 2005). Among affluent countries, then, it may not be of great concern that an egalitarian redistribution of resources places a lower ceiling on the opportunities available to well-off students. Because standards of living are still relatively high in the egalitarian affluent countries, well-off students still have sufficient resources to excel. It thus could be that egalitarian societies do *not* produce fewer very high achievers; in other words, an equality–achievement trade-off might not exist after all. As would be expected based on the theory of diminishing marginal returns, the higher ceiling on resources at the top of less egalitarian societies' economic ladders may not translate into larger populations of very highly skilled students. If additional resources matter less at very high levels, then the additional resources available to well-off students in less egalitarian countries such as the United States may not lead to a higher top end of the skill distribution after all.

Extending Existing Studies

Existing cross-national education research has considered the impact of economic inequality on achievement broadly speaking, but my approach departs from most past studies in two major ways. First, *countries* are my unit of analysis. Whether egalitarian societies are trading high achievement or achieving compatible goals is a societal-level question that necessitates a societal-level analysis. Most existing studies of economic inequality and achievement use *individuals* as the unit of analysis. As a result, we know that economically advantaged students tend to outperform their less advantaged peers within many countries (Marks, 2005; Marks et al., 2006; Schiller, Khmelkov, & Wang, 2002). And some studies have used two-level modeling to incorporate country-level factors such as income inequality into models of average achievement (Chiu & Khoo, 2005; Chudgar & Luschei, 2009; Chiu, 2010). A few indeed have used countries as the unit of analysis (Siddiqi, Kawachi, Berkman, Subramanian, & Hertzman, 2007; Wilkinson & Pickett, 2009), but these are exceptions to the norm.

Second, I examine the relationship between economic inequality and the *distribution* of achievement within countries. The aforementioned studies tend to focus either on individual-level achievement or, when countries are analyzed, on *average* achievement. As a result, we know little about what is happening at the top and bottom of the skill distributions in egalitarian and less egalitarian societies. This leaves an important question unaddressed: If egalitarian countries have higher average achievement than inegalitarian countries, do they attain it by bringing up the bottom at the cost of bringing down the top? The analyses to which I now turn address this question head-on.

Data and Methods

The analyses that follow draw on data from the 2006 PISA, combined with country-level data gathered from other sources. The

Organisation for Economic Co-operation and Development (OECD) conducts PISA, which for 2006 sampled 398,750 students from 57 countries. Within each country, PISA targeted 15-year-olds attending Grade 7 or higher in an educational institution. Students completed assessments of their academic skills and answered questions about their background, and school principals completed surveys pertaining to their schools. PISA measured students' reading, math, and science skills. An error in the administration of the reading exams invalidated the U.S. scores; therefore, because I was interested primarily in U.S. achievement, I did not analyze the reading results. Furthermore, because of space limitations, I focus here on the results from analyses of math scores, merely noting along the way how the patterns for science compare and contrast.

My research questions pertained to affluent countries, and I therefore limited my analyses to the 30 members of the OECD. Determining where to draw the line between affluent and nonaffluent countries was somewhat arbitrary, but OECD membership served as a rough proxy. My preliminary analyses revealed three statistical outliers—Luxembourg, Mexico, and Turkey—which I dropped from the analyses. (Luxembourg has a much higher gross domestic product [GDP] per capita than the rest of the OECD countries, and its population is very small. Mexico and Turkey have very low GDP per capita, very low achievement, and very high income inequality.) With these three countries excluded, I ended up with a set of 27 of the world's most affluent countries. (It is worth mentioning, however, that when all 30 countries are included, the findings are very similar.) A handful of the 27 selected countries may not fit the mold of what we typically consider to be affluent countries, but their inclusion is useful for contextualizing U.S. income inequality and achievement.[1]

I estimated the 27 countries' mean achievement and the percentages of their students whose scores fell within each of seven PISA-defined proficiency levels. Given my research questions, I was most interested in the percentages of students scoring above the top proficiency level and below the bottom proficiency level. These percentages gauge the size of countries' very high- and very low-achieving student populations.[2] (In supplemental analyses, I found that the conclusions drawn in this article held when I operationalized high achievement as the percentage of students scoring above the top two proficiency levels, and low achievement as the percentage scoring below the bottom two levels.) To aggregate these measures, I used software provided by PISA called the International Database (IDB) Analyzer. PISA used two-stage stratified sampling, with schools sampled first (with probability proportional to size) and approximately 35 students within each school sampled second. To account for these sampling procedures, as well as for the plausible value methodology employed for the achievement scores, the IDB Analyzer uses appropriate sampling weights and all five plausible achievement scores to ensure accurate population estimates for countries (Rutkowski, Gonzalez, Joncas, & von Davier, 2010).

To measure economic inequality, I used Gini coefficients for household disposable income inequality. This approach admittedly excludes wealth inequality, but reliable cross-national data on wealth inequality are difficult to obtain (Wolff, 2002). It is also worth noting that, at least in the United States, wealth is far more unequally distributed than income. Therefore, measures of income inequality probably underestimate the degree of broader economic inequality.

The Gini coefficient for income inequality ranges from zero to 100, with zero representing a perfectly equal distribution of income and 100 representing a perfectly unequal distribution. The Gini coefficients used here are based on disposable income after taxes and transfers; therefore, they gauge the level of income inequality that remains after societies' economic policies have had their impact. The OECD calculates Gini coefficients from various countries' surveys for various years; I used the estimates from a single year in the mid-2000s, most often 2004 or 2005, ensuring that my key independent variable would be measured just prior to the dependent variables. (For details, see OECD, 2008.) The Gini coefficients for the 27 countries ranged from 23 (Denmark and Sweden) to 38 (Portugal and the United States).

To measure countries' levels of affluence in 2005, I drew on OECD reports of GDP per capita in U.S. dollars, using purchasing power parities (I divided by 1,000 to help make the regression results more interpretable). This measure gauges the per-capita economic output of a country, commonly used to indicate affluence or overall standard of living. Although I focused on relatively affluent countries, their GDPs per capita still varied considerably—from $12,800 (Poland) to $43,200 (Norway)—and this variation should be taken into account in any estimate of the impact of inequality on achievement. Finally, the 15-year-old student populations of these countries varied drastically (from 4,820 in Iceland to more than 4 million in the United States), and it may be more difficult for larger and more heterogeneous countries to produce high achievement than it is for smaller and more homogenous countries. I therefore measured the number of 15-year-olds in each country to capture variation in the sizes of the student populations that the countries' education systems served (I used data provided by PISA and divided these numbers by 1 million to facilitate interpretation of results).

The analyses involved bivariate scatter plots and ordinary least squares (OLS) regressions. I began by demonstrating how income inequality correlated with countries' mean achievement, percentage of students scoring above the top proficiency level, and percentage below the bottom proficiency level. I then turned to the OLS regressions to assess whether the relationships would hold when I accounted for variations in affluence and population size. Conducting multiple regression with such a small N limits the number of independent variables that can be included in a model. Moreover, since I was not analyzing a sample, the standard method of drawing inferences based on tests of statistical significance did not apply. Yet standard errors and t statistics were still useful for assessing the existence and magnitude of relationships (Kenworthy, 2004), so I flagged "significant" unstandardized coefficients. In determining the p values, I used an HC3 test for statistical significance, given the potential impact of heteroskedasticity in light of the aggregate data and small number of cases (Long & Ervin, 2000). This helped ensure accurate estimates of standard errors.

At the same time, because I was not working with a sample, I did not treat unstandardized coefficients with p values above specific cutoffs as nonsignificant findings that warranted no interpretation. Ultimately, the magnitude of the associations is more important than significance, so I present standardized coefficients for comparing the relative magnitude of associations within models. The standardized coefficients indicate the standard-deviation changes in math achievement associated with an increase of one standard deviation in the independent variables.

Findings

How is income inequality related to average achievement among the affluent countries considered here? Do the data support the *equality–achievement trade-off* scenario or the *achieving compatible goals* scenario? Figure 1 provides an initial answer: Egalitarian countries have higher average math achievement than do highly inegalitarian countries (the same is true in supplemental analyses of science achievement). Although there is considerable noise around the line of best fit, suggesting that other factors shape math achievement too, the overall pattern is clear. Looking at the United States specifically, its position on the scatter plot is informative for understanding its relatively low achievement. None of the countries considered here has a higher level of income inequality than the United States, whose nearest neighbor on the scatter plot is Portugal. Indeed, the United States and Portugal both register the highest Gini coefficients, at 38, and both are among the lowest-scoring countries in this group. In contrast, top-scoring Finland has a Gini coefficient of 27, as do several other countries that score higher than the United States. In sum, the data suggest that egalitarianism is not inconsistent with high average achievement—quite the contrary.

What about the question of very highly skilled students? Do egalitarian countries face a trade-off in which their "best and brightest" are not as highly skilled as those in less egalitarian countries? If so, they will have smaller percentages of students who have very high test scores. Figure 2 plots the relationship between income inequality and the percentage of students scoring above the top math proficiency level. Not only is there no evidence of an equality–achievement trade-off, but more egalitarian countries have *higher* percentages of highly skilled students than do less egalitarian countries (the same is true in supplemental analyses of science achievement). The United States, with its high level of income inequality, is among a handful of countries with very low percentages of high-scoring students and relatively high levels of income inequality. This pattern contradicts the idea that high inequality produces more highly skilled students through greater investment in the "best and brightest." Instead, egalitarianism and educational excellence appear to be compatible goals.

What about the flip side? High inequality is not associated with larger percentages of highly skilled students, but is it associated with larger percentages of low-skilled students? In Figure 3, we see that less egalitarian countries do indeed have larger percentages of low-scoring students than egalitarian countries. In the United States, nearly 10% of students fall below what PISA defines as the lowest level of math competency, surpassed only by Portugal, Italy, and Greece. Taken together, then, Figures 2 and 3 suggest that more egalitarian countries not only produce lower percentages of low-skilled students than less egalitarian countries do, but also are able to produce larger percentages of highly skilled students while doing so. Thus far, the data show no evidence of an equality–achievement trade-off for egalitarian societies. Those societies have higher average achievement, more very highly skilled students, and fewer very low-skilled students, in comparison with less egalitarian countries.

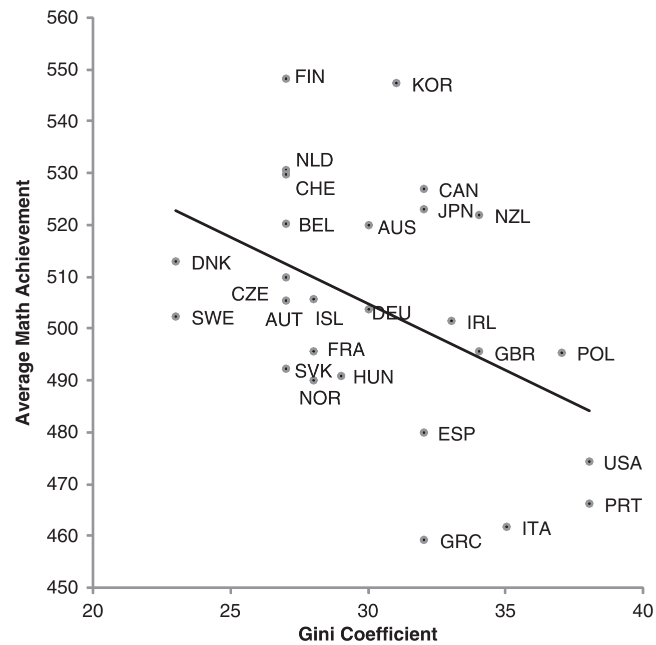

FIGURE 1. *The relationship between income inequality and average math achievement. AUS = Australia; AUT = Austria; BEL = Belgium; CAN = Canada; CHE = Switzerland; CZE = Czech Republic; DEU = Germany; DNK = Denmark; ESP = Spain; FIN = Finland; FRA = France; GBR = United Kingdom; GRC = Greece; HUN = Hungary; IRL = Ireland; ISL = Iceland; ITA = Italy; JPN = Japan; KOR = South Korea; NLD = Netherlands; NOR = Norway; NZL = New Zealand; POL = Poland; PRT = Portugal; SVK = Slovak Republic; SWE = Sweden; USA = United States.*

Skeptics might note that egalitarian countries have lower standards of living than the United States and that our conclusions about the impact of inequality would change if we accounted for this pattern. In addition, egalitarian countries that outperform the United States have much smaller and more homogenous populations—arguably making it easier for them to produce high achievement—so we should account for this pattern as well. Table 1 presents the results of regression analyses addressing these concerns. Models 1, 3, and 5 replicate what Figures 1, 2, and 3 show. Models 2, 4, and 6 are of particular interest, as they allow us to assess not only whether the relationships between income inequality and achievement hold when GDP per capita and population size are controlled, but also the relative magnitude of each variable's association with achievement (standardized coefficients are in brackets).

First, the relationships between income inequality and achievement do indeed persist in the adjusted models. Even after controlling for GDP per capita and population size, income inequality is negatively associated with average achievement and the percentage of high-scoring students and positively associated with the percentage of low-scoring students. Second, GDP per

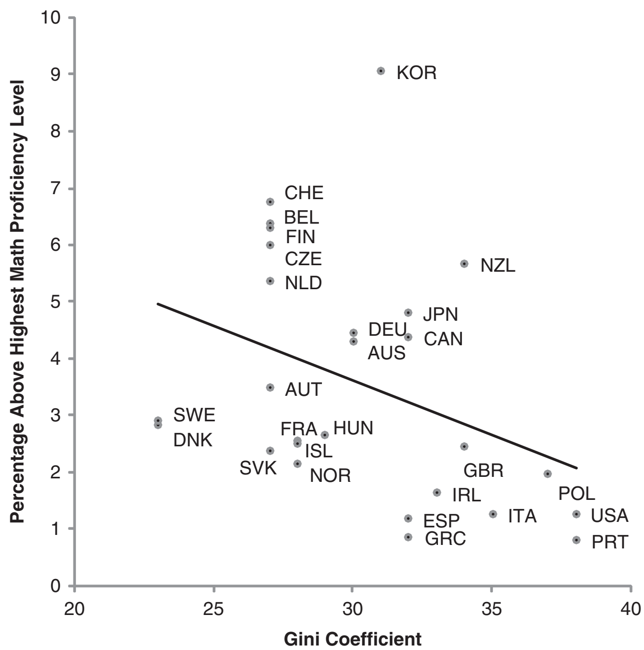

FIGURE 2. *The relationship between income inequality and percentage of students scoring above the highest math proficiency level. AUS = Australia; AUT = Austria; BEL = Belgium; CAN = Canada; CHE = Switzerland; CZE = Czech Republic; DEU = Germany; DNK = Denmark; ESP = Spain; FIN = Finland; FRA = France; GBR = United Kingdom; GRC = Greece; HUN = Hungary; IRL = Ireland; ISL = Iceland; ITA = Italy; JPN = Japan; KOR = South Korea; NLD = Netherlands; NOR = Norway; NZL = New Zealand; POL = Poland; PRT = Portugal; SVK = Slovak Republic; SWE = Sweden; USA = United States.*

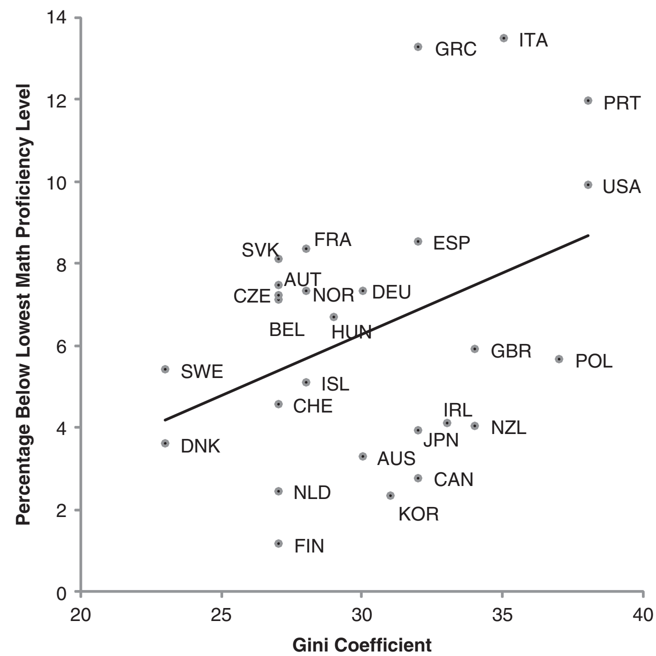

FIGURE 3. *The relationship between income inequality and percentage of students scoring below the lowest math proficiency level. AUS = Australia; AUT = Austria; BEL = Belgium; CAN = Canada; CHE = Switzerland; CZE = Czech Republic; DEU = Germany; DNK = Denmark; ESP = Spain; FIN = Finland; FRA = France; GBR = United Kingdom; GRC = Greece; HUN = Hungary; IRL = Ireland; ISL = Iceland; ITA = Italy; JPN = Japan; KOR = South Korea; NLD = Netherlands; NOR = Norway; NZL = New Zealand; POL = Poland; PRT = Portugal; SVK = Slovak Republic; SWE = Sweden; USA = United States.*

capita and population size have virtually no association with achievement. Their standard errors are very large relative to their unstandardized coefficients, making it difficult to attribute substantive meaningfulness to the unstandardized coefficients. Third, and most tellingly, the magnitude of income inequality's coefficient is consistently the largest within the adjusted models. This is especially the case for average achievement and high achievement, as the standardized coefficients for income inequality dwarf those of GDP per capita and population size. It is less true in the model of low achievement, which reveals a negative association with GDP per capita and a positive association with population size. Still, the standardized coefficient for income inequality is much larger. All in all, the relationships between income inequality and math achievement depicted in the figures hold, even net of differences in standard of living and population size.

In analyses of science achievement, income inequality's negative association with average achievement in Model 2 is only approximately twice as strong as the effect of GDP per capita (it is four times as strong for math). In Model 4, income inequality has no discernable association with high science achievement; here GDP per capita matters most ($\beta = .20$). In Model 6, the magnitude of the coefficient of population size rivals that of income inequality ($\beta = .21$ for both). Overall, although the results for science are not identical to those for math in the multiple regressions, they provide no evidence of an equality–achievement trade-off. We still see a negative link between income inequality and average achievement and no evidence that income inequality helps societies produce more very highly skilled students.

The results thus far suggest that highly inegalitarian affluent countries such as the United States could boost average student achievement by reducing income inequality. To provide an illustration, I use the results of Model 2 in Table 1 to calculate predicted values under several conditions for the United States and Finland, which are presented in Table 2. I focus on these two countries because they are very different and therefore are useful for drawing a contrast. The United States has high income inequality, high GDP per capita, and by far the largest population of 15-year-olds among the countries considered here. Finland, on the other hand, is among the most egalitarian countries, has a GDP per capita approximately $10,000 lower than that of the United States, and is among the smallest in population. Of course, the countries differ in many other ways that could shape achievement, and these analyses are unable to capture all of those differences. In addition, readers should be cautioned that none of the analyses presented here establish causal relationships. This exercise is not intended to imply causality but rather to use two very different countries to illustrate the different magnitudes of the relationships of income

Table 1
OLS Regression Estimates of the Impact of Income Inequality on Math Achievement (*N *= 27)

	Average Achievement		Percentage Above Highest Proficiency Level		Percentage Below Lowest Proficiency Level	
Independent Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Income inequality	−2.57**	−2.31*	−.19**	−.22*	.30**	.23
	(.93)	(1.27)	(.09)	(.13)	(.14)	(.20)
	[−.44]	[−.40]	[−.37]	[−.41]	[.38]	[.28]
GDP per capita (in thousands)		.30		−.03		−.08
		(.62)		(.07)		(.09)
		[.10]		[−.09]		[−.19]
Number of 15-year-olds (in millions)		−1.57		.14		.47
		(14.91)		(1.29)		(1.70)
		[−.05]		[.05]		[.12]
Intercept	581.90	565.67	9.37	10.78	−2.77	1.68
R^2	.20	.21	.13	.14	.14	.18

Note. Numbers without parentheses or brackets are unstandardized coefficients; numbers in parentheses are robust HC3 standard errors; numbers in square brackets are standardized coefficients. OLS = ordinary least squares.
*$p < .10$, two-tailed. ** $p < .05$, two-tailed.

inequality, affluence, and population size with achievement. The equation is

$$Y = 565.67 + -2.31(\text{income inequality}) + .30(\text{GDPpc}) + -1.57(\text{population}).$$

Beginning with the results for the United States, Condition 1 in Table 2 presents predicted average math achievement based on the observed income inequality, GDP per capita, and population of 15-year-old students in the United States (Y = 483.88). Condition 2 addresses the question, "What if the United States had a level of income inequality on a par with that of Finland?" We see that predicted average math achievement increases 25 points to 509.29. Condition 3 addresses the question, "What if GDP per capita were lower in the United States, on par with that of Finland?" This would be equivalent to a decline in U.S. GDP per capita of approximately $10,000. In such a scenario, average math achievement would decline by only approximately 3 points to 480.73. This is because the positive impact of GDP per capita on average math achievement is much weaker than the negative impact of income inequality among the 27 countries studied (as seen in Table 1). Finally, Condition 4 depicts a scenario in which population size remains constant but both income inequality and GDP per capita change to match Finland's levels. Here, predicted average achievement rises again, to 506.14—not quite as high as in Condition 2 because along with the boost from lower income inequality comes a slight drag from lower GDP per capita.

The bottom section of Table 2 predicts Finland's average math achievement (Y = 512.61) and how it might change with varying levels of income inequality and GDP per capita. In Condition 6, we see that predicted achievement declines by 25 points when the U.S. level of income inequality is imposed on Finland. We see in Condition 7 that if Finland's GDP per capita rose to the U.S. level, average achievement would increase by approximately 3 points. Last, in Condition 8, Finland's achievement declines when U.S. income inequality and GDP per capita are imposed on it—although not quite as far as the decline from Condition 5 to Condition 6, because in Condition 8 Finland gets a boost from the higher GDP per capita of the United States.

Supplemental analyses of science achievement tell a story very similar to that in Table 2. The only difference is that predicted achievement does not sway as much in response to change in the level of income inequality because, as noted earlier, the effect of income inequality is not as strong in the science model as in the math model. As a result, the 11-point change in the Gini coefficient (i.e., from 27 to 38 and vice versa) predicts a 10-point change in average science achievement, in comparison with the 25-point change in math achievement seen in Table 2.

In sum, these analyses of predicted average achievement further illustrate how average achievement is much more strongly correlated with income inequality than with GDP per capita. U.S. achievement gets the biggest boost by taking on Finland's level of income inequality (Condition 2); Finnish achievement declines the most when it takes on the U.S. level of income inequality (Condition 6). Indeed, whereas an 11-point change in the Gini coefficient produces a 25-point inverse change in average math achievement (10 points for science), a change in GDP per capita of approximately $10,000 produces only a 3-point change in average achievement. Overall, the relative impacts of income inequality and GDP per capita shown in Table 2 offer further evidence to contradict the notion of an equality–achievement trade-off and to support the notion that egalitarianism and educational excellence are compatible goals.

Discussion and Conclusion

From the New Deal until the early 1970s, the U.S. political economy helped reduce income inequality and boost real incomes. Scholars have dubbed this the period of "egalitarian capitalism" (Kenworthy, 2004; Massey, 2007). In contrast, the past few decades have seen income inequality increase as real wages have stagnated or declined for everyone except those at the top (Morris & Western, 1999). Will the political economy of the future maintain the current level of income inequality, reduce it, or

Table 2
Predicted Average Math Achievement Under Varying Degrees of Income Inequality and GDP Per Capita in the United States and Finland

Condition	Income Inequality	GDP Per Capita (in Thousands)	Size of 15-Year-Old Population (in Millions)	Predicted Average Achievement
United States (observed average achievement = 474.35)				
1. Observed levels in the United States	38	41.90	4.19	483.88
2. Impose Finland's level of income inequality	27	41.90	4.19	509.29
3. Impose Finland's GDP per capita	38	31.40	4.19	480.73
4. Impose Finland's level of income inequality and GDP per capita	27	31.40	4.19	506.14
Finland (observed average achievement = 548.36)				
5. Observed levels in Finland	27	31.40	.07	512.61
6. Impose U.S. level of income inequality	38	31.40	.07	487.20
7. Impose U.S. GDP per capita	27	41.90	.07	515.76
8. Impose U.S. level of income inequality and GDP per capita	38	41.90	.07	490.35

Note. Average achievement is predicted on the basis of Model 2 in Table 1.

allow it to increase further? These are important questions in and of themselves, but in this article I have highlighted the link between economic inequality and societies' educational achievement. As students in many other affluent countries continue to outperform U.S. students—who are the most economically unequal among affluent societies—the connection never has been more relevant than it is now.

What is this connection? The evidence reveals a negative association between economic inequality and average achievement among the affluent countries considered here. Less egalitarian societies have lower average achievement, lower percentages of very highly skilled students, and higher percentages of very low-skilled students. In direct contrast, egalitarian societies have higher average achievement, higher percentages of very highly skilled students, and lower percentages of very low-skilled students. Rather than facing an *equality–achievement trade-off* in which redistributing resources comes at the cost of producing few very high achievers, egalitarian societies are *achieving compatible goals* by producing highly skilled students while maintaining relatively low levels of economic inequality.

Of course, factors other than those addressed here also contribute to cross-national variation in achievement. I do not claim to have isolated a causal relationship between inequality and achievement, but at the very least it is quite evident that egalitarianism and educational excellence are compatible goals for affluent societies. Delineating potential causal mechanisms through which economic inequality shapes achievement would be an important line of inquiry for future research.

Several factors are leading suspects. First and foremost is child poverty. Indeed, numerous disadvantages accompany poverty and inhibit children's learning (Berliner, 2006; Rank, 2005). Therefore, to the extent that less egalitarian countries have higher child poverty rates, this is a potentially important mechanism through which economic inequality may affect achievement. Second, health disparities are a possible mechanism. We know that healthier children learn better than sicker children, in general (Rothstein, 2004), but the impact of economic inequality on health at the societal level is debated (Wilkinson, 2005; Mellor & Milyo, 2002). To the extent that economic inequality leads to poor health at the societal level, this could explain in part why less egalitarian countries have lower achievement. Third, some countries have higher degrees of racial/ethnic heterogeneity and inequality than others. As Fischer et al. (1996) explain, *"Groups score unequally on tests because they are unequal in society"* (p. 172; emphasis in original). To the extent that racial/ethnic groups are economically unequal, racial/ethnic heterogeneity could account for part of the association between economic inequality and achievement. Finally, economic inequality may translate into school resource inequality. The effects of school factors on achievement are debated in the cross-national education literature (Chudgar & Luschei, 2009), but it remains a possibility that countries with more economic inequality produce lower achievement partially because they have more disadvantaged students with fewer school resources available to them.

One unexpected finding was the pattern in which less egalitarian countries have lower percentages of very high-achieving students in math. (But note that this relationship does not hold for science once affluence is taken into account.) The idea of diminishing marginal returns, discussed earlier (Chiu, 2010; Chiu & Khoo, 2005), would predict *similar* percentages of very highly skilled students in all of these affluent countries; yet—and this is more true for math than for science—we observe notable variation around a pattern in which more income inequality correlates with having *fewer* very high-achieving students. What might explain this? Other factors, such as differences in education systems across countries, also drive the extent to which societies produce very highly skilled students. But it is worth noting that other research on inequality's consequences for societies uncovers a similar pattern. Studies have found that the well-off in egalitarian societies are healthier than the well-off in less egalitarian societies, although the reasons are not entirely clear (see Wilkinson & Pickett, 2009). Evidence seems to be mounting that high inequality is bad for everyone, not just those at the bottom. But additional research is needed to determine why this is the case.

This study highlights the connection between economic inequality and educational achievement, a connection that holds an interesting place in the literature and in public discourse. On the one hand, a massive literature addresses the impact of students' economic backgrounds on achievement and related outcomes in the United States (e.g., Alexander, 1997; Berliner, 2006; Gamoran, 2001; Lareau, 2002). As a result, it is common knowledge that economically advantaged children have an edge when it comes to education, a point that few would deny. On the other hand, when U.S. students' achievement is compared with that of students in other countries in public discourse, the impact of economic inequality is often minimized at best and completely ignored at worst. Two recent examples illustrate.

First, in 2007 *Education Week* published an article about the 2006 PISA results and made the important point that the impact of students' economic background on achievement is stronger in the United States than it is in many of the top-performing countries (Cavanagh, 2007). The article argued that the U.S. pattern cannot be explained "simply by its having a more economically diverse pool of students" and quoted an official who said that Finland was "'able to [lessen] the impact of socioeconomic background'" on achievement. This argument fails to acknowledge that Finland has, in fact, much less economic inequality than the United States. The article quoted another official as saying that "the U.S. education system does not do a good job in compensating for nonschool achievement factors." This statement may be true in itself, but again, it underemphasizes the fact that the U.S. education system, in comparison with those in more egalitarian countries, must contend with much greater economic inequality among its students.

Second, in the debates for the 2008 U.S. presidential election, candidates Barack Obama and John McCain faced just one question regarding education, which CBS news anchor Bob Schieffer posed at the end of the final debate:

> The U.S. spends more per capita than any other country on education, yet by every international measurement in math and science competence from kindergarten through the twelfth grade, we trail most of the countries of the world. The implications of this are clearly obvious. Some even say it poses a threat to our national security. Do you feel that way and what do you intend to do about it?

Predictably, the candidates' responses included nothing about the high level of economic inequality among U.S. students, what role it might play in shaping achievement, or how reducing economic inequality might help raise U.S. students' achievement. Instead, they discussed school reform issues such as accountability, charter schools, and vouchers. Economic inequality does factor into economic school integration (Kahlenberg, 2001), but this policy solution, too, leaves such inequality intact. Like most school-based reforms, school integration places the burden of boosting achievement and reducing economically based disparities on the *education* system rather than the broader *economic* system, which, as I and others have emphasized, plays such an important role.

For many, the education system *should* aim to reduce economic achievement disparities; this is consistent with the longstanding belief that U.S. schools should be "the great equalizer" (Johnson, 2006). Yet it is problematic to think that schools can reduce achievement disparities by themselves (Rothstein, 2004). Schools are embedded within the economic systems of their societies, and where economic systems have high inequality, overcoming the impact of this inequality on students' learning will be more difficult. Why not aim for the root of the problem? Keeping in mind that low inequality need not harm economic performance (Breen, 1997; Fischer et al., 1996; Kenworthy, 2004; Pontusson, 2005) and that egalitarian societies do not have fewer very highly skilled students, the evidence presented here suggests that creating a more egalitarian economic system might help improve—and certainly would not harm—U.S. students' skills.

NOTES

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[1]The 27 countries are Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, South Korea, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

[2]The PISA achievement scales have a mean of 500 and a standard deviation of 100. The OECD (2007) provides details on the proficiency levels, but it is useful to draw a brief contrast between the top and bottom levels here. Students scoring above the highest math proficiency level have scores above 669.3 and "are capable of advanced mathematical thinking and reasoning. These students can apply insight and understandings, along with a mastery of symbolic and formal mathematical operations and relationships, to develop new approaches and strategies for attacking novel situations" (p. 313). Students scoring below the lowest math proficiency level have scores below 357.8 and "usually do not demonstrate success on the most basic type of mathematics that PISA seeks to measure. . . . Such students will have serious difficulties in using mathematics as an effective tool to benefit from further education and learning opportunities throughout life" (p. 315).

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The wrong source was given for the International Database Analyzer. The Analyzer is provided by the International Association for the Evaluation of Educational Achievement (IEA). It can be downloaded by visiting http://www.iea.nl/fileadmin/user_upload/IEA_Software/IDBAnalyzer_PISA_Setup.exe.

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In Table 2, the sample mean (SD) for English Language should have been 91.9 (15.4), and the sample mean (SD) for English Reading should have been 90.7 (17.26).

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Christian Faltis's journal editorships were described incorrectly. He has served as editor of the *TESOL Journal* and of *Educational Researcher*'s Research News and Comment section and is editor of *Teacher Education Quarterly*.

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