Questioning Quintiles: Implications of Choices of Measures for Income Inequality and Social Mobility

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Questioning Quintiles: Implications of Choices of Measures for Income Inequality and Social Mobility

Abstract
Movement across quintiles of household income has become a standard measure of social mobility. This choice of what to count (households rather than people) is consequential. Earlier, absolute measures of social mobility (such as the percentage of sons of blue-collar fathers gaining white-collar positions). However, measuring movement across quintiles conceptualizes social mobility as relative, as a zero-sum game (in that it seems obvious that for each person who moves to a higher quintile, another must fall). However, there are problems with using quintiles. First, each quintile contains a fifth of all households, rather than a fifth of all people. There are far more people in the top quintile than in the bottom. Second, while income inequality is increasing, the increase is not because the proportion of the population that is low-income is increasing, but because the upper-middle class is expanding (and now includes more than a fifth of all households). While choosing to measure mobility in terms of quintiles is not mathematically wrong, it shapes the way the data can be read. Understanding the consequences of such choices is relevant to understanding the numeracy of the measure.

Keywords
quintiles, social mobility, household income

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Cover Page Footnote
Introduction

Quintiles of household income have become a standard measure used in public debates about contemporary economic inequality and social mobility (e.g., recent reports on social mobility: the Pew Charitable Trusts Economic Mobility Project 2012; the Brookings Institution 2014a). The goal of this paper is to examine how using quintiles of household income to measure inequality and mobility is consequential; specifically, it draws our attention to particular features of these topics while ignoring others.

It is important to appreciate that earlier generations of social scientists (e.g., Lipset and Bendix 1959; Thernstrom 1964) adopted different measures of mobility, often the rate of moving from blue- to white-collar occupations. This measure could be used to track both individual mobility (e.g., the percentage of individuals who started out in blue-collar jobs but wound up in white-collar occupations) and intergenerational mobility (e.g., the percentage of sons of blue-collar fathers who went into white-collar work). Measuring mobility was understood to be an important topic because many Americans assumed that the United States was a uniquely open society that offered many more opportunities for upward mobility than other countries, as reflected in celebrations of the American Dream and Horatio Alger’s stories. In fact, the researchers’ results tended to dampen this enthusiasm: they showed that only a minority of blue-collar Americans were upwardly mobile, and that mobility rates in the United States weren’t that different from those in other countries.

Still, measuring mobility from blue- to white-collar seemed to make sense. It had a sort of face validity; blue- and white-collar work seemed like proxies for the working and middle classes. It was relatively easy to find data on occupations, which are included in nineteenth-century manuscript census schedules, as well as in most contemporary datasets; this availability made it possible to compare mobility patterns across time and space. And it could be used to produce a single number (e.g., X% of sons of blue-collar fathers entered white-collar occupations); at least in theory, the mobility rate could range from 0 to 100 percent.

However, it is also easy to see why contemporary social scientists favor measuring mobility across quintiles of household income. Income is measured in dollars, which puts an end to anomalies, such those blue-collar workers who earn more than many in white-collar jobs. Studying data about households could also circumvent some outmoded assumptions about families and gender: households could be headed by females, built around same-sex couples, and so on. Quintile

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1 Richard Reeves (2014b) of the Brookings Institution also produced an appealing YouTube video, “Is America Dreaming: Understanding Social Mobility” that illustrates their findings in an especially accessible manner.
data can also be compared to other countries, so long as their governments package income data in quintiles, and they can be used to measure inequality, as well as mobility. But, perhaps most importantly, quintile data are accessible. The Census Bureau conducts an annual Current Population Survey and publishes data on household income (particularly Table HINC-05: “Percent Distribution of Households, by Selected Characteristics within Income Quintile and Top 5 Percent”) (U.S. Census Bureau 2017).

What the Data on Household Income Quintiles Show

During the roughly thirty years since World War II, the United States experienced relatively equal percentage increases in income across all five income quintiles. In each quintile; income (in constant dollars) roughly doubled: by some measures, the bottom quintile actually increased the most (116%), while the top quintile increased the least (99%) (Frank 2007). However, recent decades have seen a very different pattern; household income has barely increased in the bottom quintile, while it has risen substantially in the top quintile. These increases have been most dramatic at the very top—those in the so-called “One Percent” have seen their incomes rise far more than other groups within society. By all accounts, this has been a period of rising inequality in the United States.

Studies of intergenerational mobility across quintiles of household income also reveal a disturbing pattern, what the Pew Charitable Trusts Economic Mobility Project (2012) calls “stickiness.” That is, adults tend to wind up near the quintile that their parents occupied. The largest proportion of children raised in the bottom quintile tend to remain “stuck” in that quintile, the next largest share move only to the quintile above the bottom, and so on; only a small percentage manage to move all the way to the top quintile. Similarly, children raised in the top quintile are most likely to remain there, with relatively few falling all the way to the bottom quintile. Although Reeves (2014b) declares: “[In] a perfectly mobile society—an opportunity utopia—being born . . . in the bottom quintile would have no effect on where you ended up: you’d be equally likely to make it to the top as to stay at the bottom,” the data reveal a pattern very different from that utopian vision.

Concerns about Quintiles

Measuring social mobility as movement across quintiles has consequences. Crossing the blue-collar/white collar line was not a zero-sum game; it was possible for more people to rise than to fall (and, in practice this is what happened as industrialization reshaped the workforce by creating many millions of white-collar
jobs). But measuring mobility in terms of shifting quintiles involves very different assumptions, as Reeves (2017: 10) acknowledges: “It is a stubborn mathematical fact that, at any given time, the top fifth of the income distribution can accommodate only 20 percent of the population. Relative intergenerational mobility is necessarily a zero-sum game. For one person to move up the ladder, somebody else must move down.”

While it seems commonsensical that “the top fifth of the income distribution” contains “20 percent of the population”, this is wrong. Remember that the Census Bureau presents data for quintiles of household income. That is, each quintile contains the same number of households, not equal numbers of people. While we might tend to equate a household with a nuclear family (i.e., a father, mother, and their kids), households can take lots of forms. There are one-person households, each composed of an individual living alone who is single, divorced, widowed, etc. There are children living in households with only one parent, or with one of more grandparents, and so on.

This diversity in household types is not trivial because it affects income. Table 1 compares the composition of the top and bottom quintiles from the 2016 Current Population Survey. The differences are stark. Only 17 percent of bottom-quintile households contain married couples, compared to 77 percent in the top quintile. More than half (57%) of the bottom-quintile households consist

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Bottom Quintile &lt;$24,002 (thousands of households)</th>
<th>Top Quintile &gt;$121,018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>25,245</td>
<td>25,245</td>
</tr>
<tr>
<td>Married couple families</td>
<td>4,388</td>
<td>19,314</td>
</tr>
<tr>
<td>Males living alone</td>
<td>5,583</td>
<td>1,158</td>
</tr>
<tr>
<td>Females living alone</td>
<td>8,817</td>
<td>678</td>
</tr>
<tr>
<td>Head &gt;65</td>
<td>9,527</td>
<td>3,886</td>
</tr>
<tr>
<td>No earners</td>
<td>15,794</td>
<td>970</td>
</tr>
<tr>
<td>Two or more earners</td>
<td>1,090</td>
<td>18,773</td>
</tr>
<tr>
<td>Head employed full-time</td>
<td>4,533</td>
<td>19,619</td>
</tr>
</tbody>
</table>

of individuals living alone, compared to only 7 percent of the top-quintile households. More than twice as many households in the bottom quintile are headed by someone over age 65 (38% vs. 15%). Vastly more top-quintile households have two earners (74% vs. 4%) and are headed by someone who is employed full-time (78% vs. 35%). Of course, if we pause to think about it, it is not particularly surprising to discover that the bottom quintile has more single-person households, more households headed by someone over 65, and fewer households where the head is employed full-time. But this pattern means that the bottom and top quintiles differ in their compositions, as well as just their incomes.
What is perhaps more surprising is the discovery that all those single-person households dramatically affect the bottom quintile’s population. In 2016, the population of the top quintile (78.3 million) was about 76 percent larger than that of the bottom quintile (44.5 million). Quintiles of households are not quintiles of people. That “stubborn mathematical fact that . . . the top fifth of the income distribution can accommodate only 20 percent of the population” proves to be an illusion. The highest-earning fifth of all households contains about 24 percent of the population (estimated to have been 323.1 million in 2016), while the lowest quintile contains only about 14 percent of the people.

The Rise of the Upper-Middle Class

We regularly hear claims that the middle class is shrinking. When we hear this, it is easy to assume that this must mean that more people are falling behind, that the proportion of the population that is poor is growing. This is wrong. The sector of the population that is growing is the upper-middle class.

There is no single authoritative definition of what it means to be upper-middle class. Most analysts use an income range to identify those in the upper middle, e.g. Rose (2016, 4) sets “the bottom threshold for the upper middle class at five times the poverty level, or $100,000 for a family of three.” Liberal and conservative observers agree on several patterns that distinguish this income grouping (Brooks 2000; Murray 2012; Putnam 2015). Increasingly, the upper middle class consists of highly-educated individuals, who tend to marry highly-educated partners. They are more likely to stay married, and to have two incomes. They have longer lifespans, but have fewer unintended pregnancies, fewer unplanned births, and fewer children. Moreover, they tend to live among others who share these characteristics.

Importantly, the upper-middle class is growing. According to Rose’s (2016) classification, between 1979 and 2014, the proportion of the population that is upper-middle class more than doubled, from 12.9 percent of the population to 29.4 percent, while the middle class, lower-middle class, and poor or near-poor

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2These totals are approximate. Table HINC-01 (“Selected Characteristics of Households by Total Money Income”) gives the number of people in households, from one to seven or more for different income categories (U.S. Census Bureau 2017). Since the top income in the bottom quintile was $24,002 (see Table 1), I multiplied the number of households in a given cell by the population of that household (assuming that there were only seven people in the households with at least seven members, and multiplying the figure in the $20,000-$24,999 category by 0.8), then adding the total to get the number of people in the bottom quintile. Similarly, since the bottom of the top quintile was $121,018, I added 0.8 of the population in the $120,000-124,999 category to the figures for all of the higher income categories.
categories all shrank (the upper class also grew, from 0.1 percent to 1.8 percent).³ Remember that this period was when incomes rose more rapidly at the top than the bottom; Rose calculates that, had income growth been more even across the social structure, the upper-middle class would have grown to an even larger share—35.2 percent—of the population. Notice that even under uneven income growth, the upper-middle class now accounts for well over a fifth of the population, so that it has penetrated the second household-income quintile.

The expansion of the upper-middle class can be viewed as a continuation of the long-term trend in rising living standards. A century ago, most people’s homes lacked running water, electricity, or telephones (Leon 2016). Today, substantial majorities (i.e., 78-99%) of poor households have air conditioning, a microwave, a television, and a refrigerator—all basically unavailable 100 years ago (Rector and Sheffield 2011). Impossible-to-imagine luxuries have become ubiquitous, even among those with the lowest incomes. In other words, if we measure social conditions using absolute standards (such as improvements in life expectancy, educational attainment, or standard of living), it is easy to view the glass as half-full, and to view the expanding upper-middle class as harbingers of society’s growing prosperity.

Still, critics favor using relative standards (such as movement among quintiles) that encourage half-empty interpretations. Richard Reeves (2017) describes the upper-middle class as “dream hoarders.” Because he views mobility as a zero-sum game, he argues that creating opportunities for those in lower quintiles to rise requires people falling out of the top quintile: “For one person to move up the ladder, somebody else must move down. Sometimes that will have to be one of our own children.” (p. 10). But being a member of the upper-middle class is “sticky” because its members are able to give their offspring advantages in the competition for social position: upper-middle class parents adopt a set of “concerted cultivation” child-rearing practices that give children skills that will prove useful when they encounter schools and other institutions run by unfamiliar adults (Lareau 2011); they can choose to raise their children in areas with better schools; they (and their children) receive more guidance on choosing and applying for colleges; they have more discretionary income that they can save in tax-sheltered Section 529 college-savings accounts; and they are better placed to take advantage of legacy admission programs and unpaid internships. Such advantages make it easier for children from upper-middle class families to “stick” in the upper-middle class. If we assume that mobility is a zero-sum game, then these advantages serve to hoard—to block access to—the American Dream; however, if we view mobility as

³For a parallel analysis using a different data set, see Perry (2016). These studies define the different social classes in terms of income.
a non-zero-sum game, in which prosperity in general—and the upper-middle class in particular—is expanding, then the language of hoarding seems less applicable.

**Prospects for Upward Social Mobility**

It is possible to exaggerate the rigidity of America’s social structure. Rank, Hirschl, and Foster (2014) used the Panel Study of Income Dynamics dataset (covering 1968-2009) to track the economic situation of American adults. They found that nearly 90 percent owned their own home at some point during their lives, and that “upward and downward income movement is very much part of the American economic landscape” (p. 99). Three-quarters of adults experienced at least one year of affluence (defined as an income exceeding $100,000) and nearly half experienced at least one year of near poverty (defined as income below 125 percent of the official poverty line): “In recent years we have heard much talk about the 1 percent and the 99 percent of the population. These percentages are often portrayed as static and unchanging. However, our analysis demonstrates that these percentages are by no means static, with many people moving in and out of the various top levels of the income distribution” (p. 96). Rather than being stuck in the same quintile for their entire lives, individuals often move up and down within the larger income structure.

Census Bureau statistics affirm this pattern. Periodically the Bureau presents results from panel studies that examine whether households shift income quintiles over a roughly three-year period. In the most recent study, about 43 percent of households moved—either up or down—into a new income quintile between 2009 and 2012 (Hisnanick, Giefer, and Williams 2016). In other words, while most households remain stuck in the same quintiles across a three-year period, a substantial minority switches quintiles (although this study reported less movement than there had been in the Bureau’s 1996-1999 analysis, when 48 percent of households had moved from one quintile to another [Hisnanick and Walker [2004]).

But most commentators are less interested in intragenerational mobility than intergenerational mobility, and they tend to focus on studies of mobility across income quintiles that measure relative mobility. Measures of absolute mobility offer a somewhat positive picture. About two-thirds of Americans wind up earning higher incomes than their parents, and the percentage of those outearning their parents is nearly twice as high for those whose parents were in the bottom quintile (82 percent) than those with top-quintile parents (43 percent) (Issacs 2008).

But critics’ glass-half-empty interpretations tend to emphasize three factors that dramatically affect the chances of bottom-quintile children rising to the top quintile. The first of these is education: among those raised in the bottom quintile who graduate from college, only 10 percent remained stuck in the bottom, while 10
percent rose all the way to the top; whereas the comparable figures for those who did not receive a college degree were 47 percent staying in the bottom and only 3 percent rising to the top (Pew Charitable Trusts Economic Mobility Project 2012). It turns out that all that advice about the importance of getting an education is well-founded.

The second factor, family structure, has similar effects. Among bottom-quintile children raised by never-married mothers, 50 percent remained stuck, while only 5 percent rose to the top quintile; in contrast, among those with continuously-married mothers, only 17 percent stayed in the bottom quintile, while 19 percent reached the top (Reeves 2014a). Having married parents carries substantial advantages.

The third—and the most troubling—factor is race. In the Brookings study, 51 percent of blacks remained stuck in the bottom quintile, while only 3 percent made it to the top; the comparable figures for whites were only 23 percent remaining in the bottom, while 16 percent rose to the top (Reeves 2014a). These are disturbing differences. Critics may argue that African-Americans, “like all Americans, are in a much better position to succeed if they honor certain basic norms: graduate from high school; get a full-time job; don’t have a child before age 21 and get married before childbearing” (Lowry 2015). However, Reeves, Rodrigue, and Gold (2015) point out that, only considering those who follow this “success sequence”—who complete high school, find full-time work, and delay childbearing until they are married and over 21—whites continue to have an advantage: 73 percent of whites and only 59 percent of blacks who followed all three rules attained middle class status.

In sum, there are various ways to approach the study of mobility. Among these, choosing to measure relative mobility across income quintiles highlights obstacles to—rather than opportunities for—mobility.

**What Is to Be Done?**

In his video, Reeves (2014b) states: “[In] a perfectly mobile society—an opportunity utopia—being born . . . in the bottom quintile would have no effect on where you ended up—you’d be equally likely to make it to the top, as to stay in the bottom.” So, consider a thought experiment: we organize society so that each infant at birth is randomly assigned to an income quintile. Would this indeed be an “opportunity utopia”?

Most Americans probably accept the proposition that people should be rewarded for hard work. This proposition means that parents who invest time in raising their children by feeding them nutritious diets, reading to them, and encouraging them to do their best, and students who take their studies seriously, as
well as employees who work hard at their jobs, are seen as meritorious. Our thought experiment’s assignment of income by lottery would make a mockery of these values.

And, in fact, Reeves concedes as much: “In a society with a largely open, competitive labor market, it is not ‘creepy’ to want your children to end up higher on the earnings ladder than others. Not only will this bring them a higher income, and all the accompanying choice and security, it is also likely to bring them safer and more interesting work” (2017, 99–100). Rather, he defines opportunity hoarding as “when valuable, scarce opportunities are allocated in an anti-competitive manner: that is, influenced by factors unrelated to an individual’s performance” (pp. 100-01).

Rather than focusing on trying to discourage dream hoarding in order to maximize movement across income quintiles, it might make more sense to appreciate the value of increasing prosperity and the expanding upper-middle class, and work toward lifting the absolute—rather than the relative—condition of the poorest Americans.

**Why Question Quintiles?**

Commentators use data on quintiles of household income to criticize rising inequality and to argue that American social structure creates obstacles to social mobility. There is nothing particularly innumerate about these arguments; they do not involve some sort of error in mathematic reasoning. And yet, I submitted this paper to *Numeracy*. Why?

Whenever we use numbers to describe the world, we make choices. Whenever we do original research, we confront these choices directly: we have to choose what to count (and what not to count), how to go about counting, and so on. We must define categories, devise methods of measurement, and determine what we will sample and how we will go about gathering our data. Everyone who has ever completed a piece of original research realizes that they made such choices, and that those choices were consequential, that they shaped the findings. We deal with this reality by making a point of explaining our methods, so that readers can assess whether our choices seem reasonable and evaluate whether our findings are likely to be sound.

Perhaps more often, we borrow numbers that others have produced (as when commentators use the Current Population Survey’s data on quintiles of household income). In such cases, the numbers we are interpreting have been shaped by the choices others made in creating the data. By most standards, the CPS data are pretty good: they are collected by professionals who have put considerable thought into what they collect and how they go about it; moreover, their methods are
relatively transparent. No wonder lots of people use these data with confidence. Still, understanding what numbers mean requires not just manipulating them according to sound mathematical principles, but also appreciating their limitations. Quintiles of household income illustrate this need. Understanding these data requires recognizing that:

- The category household encompasses a diverse set of social arrangements, so that we need to be careful not to assume that a quintile of households is the same as a quintile of people. It is easy to spot people casually—and carelessly—equating a quintile of households to a fifth of the population.

- Defining social mobility in terms of moving from one quintile to another posits a zero-sum game, whereas other ways of thinking about mobility (e.g., crossing the blue/white collar line, or improvements in absolute standards of living) do not make zero-sum assumptions. Zero-sum assumptions heighten a sense of conflict and injustice.

- Many individuals move up and down the income structure even in the short term, so that we need to be careful that our assumptions about the rigidity of the social structure do not blind us to the changes that actually occur.

In other words, unless we understand the choices that shaped our data, we risk making interpretations that, however mathematically sound they may be, may not be warranted. Numeracy involves more than mathematical facility; it requires thinking critically about the choices that lie behind the numbers.

**Acknowledgments**

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**References**


