THE DECLINING SIGNIFICANCE OF OCCUPATIONAL CONTINGENCY TABLES IN THE STUDY OF INTERGENERATIONAL MOBILITY*

Arthur Sakamoto
Department of Sociology
Texas A&M University
4351 TAMU
College Station, TX 77843-4351
telephone: (512) 257-9378
fax: (979) 862-4057
email: asakamoto@tamu.edu

Sharron Xuanren Wang
Department of Sociology
Texas A&M University
4351 TAMU
College Station, TX 77843-4351
telephone: (979) 845-5133
fax: (979) 862-4057
email: xw2683@tamu.edu

keywords: intergenerational mobility, occupation, mobility table, intergenerational income elasticity

Word Count: 12,063 (text, footnotes and references)

August 19, 2018

* Direct correspondence to Arthur Sakamoto at the above address.

THE DECLINING SIGNIFICANCE OF OCCUPATIONAL CONTINGENCY TABLES IN THE STUDY OF INTERGENERATIONAL MOBILITY

ABSTRACT

The study of intergenerational mobility was once viewed as a quintessentially sociological topic that was widely investigated using occupational mobility tables. However, the popularity of occupational mobility tables seems to be rapidly dwindling. This change is associated with the increasing popularity of the economic approach to modeling intergenerational mobility which is not encumbered by the shortcomings of occupational mobility tables. The first limitation of the latter is the contextual nature of occupation which provides an increasingly imprecise indicator of the individual's earnings or other socioeconomic outcomes. The second limitation is the lack of focus on long-term earnings and the continued reliance on cross-sectional data in an era of increased labor market volatility. The third limitation is the dubious practice of partitioning mobility into structural-mobility versus circulation-mobility and focusing on primarily the latter to make generalizations about the level of social fluidity in society. The fourth limitation is the failure of occupational models to discern important empirical trends (such as rising earnings inequality and the Great Gatsby Curve). The fifth limitation is that, defined as categories of primary job duties, occupation is an inaccurate indicator of non-pecuniary job rewards and compensating differentials. Younger sociologists are abandoning occupational mobility tables—despite their once great popularity—in favor of economic models which are not significantly compromised by these limitations.

Introduction: Why Is Research on Intergenerational Occupational Mobility Disappearing?

The study of intergenerational mobility has been traditionally viewed as a quintessentially sociological topic. As stated by Grusky and Weeden (2006:85), "The analysis of social mobility tables has become one of the signature contributions of sociology over the last half-century." Relating to families, educational opportunity, labor market institutions, social class reproduction, and economic development, the sociological analysis of intergenerational mobility came to be investigated primarily in terms of occupational attainment and related social class groupings (Blau and Duncan 1967; Feather and Hauser 1978; Erikson, Goldthorpe and Portocarero 1979; Hout 1983).

Many sociologists regarded intergenerational occupational mobility as one of the most advanced subfields in sociology (Grusky and Weeden 2006:85). The analysis of occupational mobility tables was seen as a leading example of successful cumulative knowledge development (Hout and DiPrete 2006). This area of research was informally viewed by many as an exemplary subfield in sociology for having reached such a high level of methodological sophistication (Grusky and Weeden 2006). During the 1980's and 1990's, intergenerational occupational mobility was thus highly regarded by many quantitative sociologists; as stated by Grusky and Weeden (2006:85), "the discipline is justifiably proud of this success."

Now, however, the popularity of occupational mobility tables seems to be rapidly dwindling. Once regularly published in the leading sociology journals, recent studies of intergenerational occupational mobility are disappearing. Many of the citation classics in this literature (e.g., Featherman, Jones and Hauser 1975) are largely unknown and rarely read. Studies of occupational mobility are much less likely to be highlighted

in textbooks or graduate seminars. Akin to what dinosaur paleontologists must ponder about the end of the Cretaceous period, the obvious question that arises in regard to mobility tables is: *what happened*? The once mighty entity seems to be perishing.

Recent reviews of occupational mobility research curiously make no mention of any serious challenges to this traditional approach (Hauser 2010; Hout 2015; Torche 2015). The view from specialists in this area seems to be that the sociological approach and the newer economic model are simply "different" (Beller and Hout 2006:22). The conventional analysis of intergenerational occupational mobility apparently does not have any significant weaknesses (Beller and Hout 2006; Grusky, Smeeding and Snipp 2015; Hout 2015; Torche 2015, 2015b; Breen, Mood, and Jonsson 2016). These recent reviews are oblivious to the possibility that interest in the sociological approach may be declining *because* the economic approach may be more informative, and that a more candid appraisal of the two is thus needed.

In the following, we provide a more frank—and we believe more realistic—assessment of the intergenerational occupational mobility model. We use the latter term broadly to also include related class typologies that have been analyzed with conventional methods for mobility tables (Erikson, Goldthorpe and Portocarero 1979; Western and Wright 1994) which in practice rely heavily on occupational categories. We do not survey the famous contributions in the sociological literature because that task has been already been accomplished elsewhere (Beller and Hout 2006; Hout 2015; Torche 2015, 2015b). Our conclusion is more critical of occupational mobility tables than has hitherto been recognized. Our assessment, however, helps to explain the reality of why economic models now seem to be becoming the dominant approach.

Economic Models of Intergenerational Mobility as a Growth Industry

First of all, sociologists have yet to openly admit that economic models of

intergenerational mobility have dramatically reinvigorated widespread interest in this topic. Results from economic estimates of intergenerational mobility are now mentioned not only by a variety of social scientists but also journalists, public intellectuals, policy institute spokespeople, politicians, television commentators, and even some comedians.[1] The Stanford Center for Poverty and Inequality has referred to economic estimates of intergenerational income mobility as being among the "20 Facts about U.S. Inequality that Everyone Should Know."[2] The "Great Gatsby Curve" has become part of the popular political lexicon to refer to the negative correlation between income inequality and intergenerational income mobility (Krugman 2012). Under President Obama, the official web site for the Office of the President of the United States posted information on the "Great Gatsby Curve."[3] As stated by the Brookings Institution, "Every so often an academic finding gets into the political bloodstream. A leading example is 'The Great Gatsby Curve' describing an inverse relationship between income inequality and intergenerational mobility."[4]

By contrast, hardly anyone outside of a small group of occupational mobility specialists has ever heard of, for example, the log-multiplicative layer-effect model for which there is no webpage in Wikipedia. Stanford's aforementioned list of the "20 Facts

---

[1] For example, see an extended discussion of economic mobility statistics by a well-known television journalist https://www.youtube.com/watch?v=P-fSgDZHvvw. Retrieved September 17, 2016.

[2] See http://inequality.stanford.edu/publications/20-facts-about-us-inequality-everyone-should-know. Retrieved September 17, 2016.

[3] See https://www.whitehouse.gov/share/the-great-gatsby-curve (viewed on September 17, 2016). See also https://www.youtube.com/watch?v=sSBNxpUe2ks for an example of President Obama delivering a speech that refers to economic statistics on economic mobility. Retrieved September 17, 2016.

[4] See https://www.brookings.edu/series/the-great-gatsby-curve/. Retrieved March 12, 2017.

about U.S. Inequality" did not mention any findings from occupational mobility research. The latter literature dates back more than half a century and is much older than the economic model of intergenerational mobility (Torche 2015:38), yet the economic approach has gained more widespread attention quite rapidly.

Although not mentioned in recent reviews, occupational models seem to be losing favor even among sociologists who study intergenerational mobility because they are increasingly adopting the economic approach. Several recent publications by sociologists investigate intergenerational mobility using economic models analyzing income (Bloome and Western 2011; Bloome 2014, 2017; Mitnik, Bryant, Weber and Grusky 2015; Breen et al. 2016; Bloome and Zhou 2017). A new major initiative to garner an array of administrative data to monitor intergenerational mobility is being spearheaded by sociologists (Grusky, Smeeding and Snipp 2015) who explicitly state the importance of providing information about income mobility statistics.

A Basic and Brief Synopsis of Models of Intergenerational Mobility

The most basic economic model of intergenerational mobility is a regression equation in which the independent variable is the log of the long-term income of the respondent's parent (using subscript p for parent) and the dependent variable is the log of the long-term income of the respondent (using subscript o for offspring):

$$\log(Y_o) = \alpha + \beta\log(Y_p) + \varepsilon. \quad (1)$$

The coefficient for this independent variable (i.e., β) is an elasticity that is often known as the intergenerational income elasticity (i.e., IGE). It is interpreted as a measure of intergenerational persistence (i.e., immobility) because it indicates the extent to which a respondent's long-term (or "permanent") income is predicted by the long-term income of the respondent's parent (Black and Devereux 2011). The smaller the estimated coefficient is, then the lower the level of intergenerational persistence (i.e., greater

mobility).

A closely related but alternative specification is to use standardized scores rather than logs in which case the correlation is obtained. That is, in bivariate regression with standardized scores, the estimated regression coefficient (i.e., β^s) is equal to the correlation:

$$\beta^s = \rho = (\sigma_p/\sigma_o)\beta \quad (2)$$

where σ_p refers to the standard deviation of parent's incomes and σ_o refers to the standard deviation of offspring's incomes. The purpose of using the correlation between the two generational long-term incomes is to factor out the effects of changes in the dispersion. The IGE will be reduced, ceteris paribus, if inequality is higher in the offspring's generation. In practice, β is more commonly estimated than ρ in most research, but both are considered useful indicators or intergenerational immobility.

Depending upon the interests of the researcher, equation 1 may of course be extended. For example, nonlinearities in the IGE are considered by (Mitnik et al. 2015). The intervening effects of childhood family structure are analyzed by Bloome (2017). Mazumder (2014) investigates rank transitions including mobility patterns across income quintiles and differentials by race. The common feature of all of these studies is the basic focus on understanding the log of the long-term income of the respondent in relation to the long-term income of the respondent's parents.

By contrast, the usual sociological approach is based on the occupational mobility table. This is a cross-classification of the frequencies of the respondent's occupational (or class) category (also known as destinations) with the respondent's parent's occupational category (also known as origins) which are standardized measures of occupation across the two generations:

$$F_{ij} = \mu\tau_i\ \tau_j\tau_{ij} \quad (3)$$

where F_{ij} is the expected frequency for the ij^{th} cell in which i refers to origins (e.g., father's occupational category in the rows of the table) and j refers to destinations (e.g., son's occupational category in the columns of the table). μ reflects the sample size while τ_i and τ_j refer to the main effects of origin and destination, respectively.

The odds ratios in the cross-classification are a function of the τ_{ij} which refer to the patterns of relative mobility in the table. That is, the τ_{ij} show the extent to which respondents with a particular origin are more or less likely to be observed in a particular destination net of changes in the occupational distribution across the two generations. These odds ratios are "margin invariant" so that contingency tables may be compared to assess relative mobility even when they have different marginal distributions.

In general, occupational mobility models seek to describe and summarize the patterns of relative mobility (i.e., the odds ratios) in the contingency table without including all of the possible τ_{ij} terms that would fit the data perfectly (i.e., the saturated model). At one extreme, the model of perfect relative mobility stipulates that all of the τ_{ij} are equal to unity (or zero after taking the log of equation 3 to obtain its log-linear formulation [Hout 1983:20]) so that destinations are entirely independent of origins. Because this model of perfect mobility never provides an acceptable statistical fit, other model formulations specify succinct patterns of association such as quasi-independence, uniform association, quasi-symmetry, and corners models among others (Hout 1983). Bayesian information criterion (BIC) statistics are often used to assess the fit of the different models with varying degrees of freedom, and models with lower BIC values are generally preferred in that they are said to have greater explanatory power (Xie 1999; Torche 2005).

The number of occupational categories is usually small between 5 and 10 when analyzing the typical survey data sets which do not have extremely large sample sizes.

Perhaps the most popular classification is the Erikson, Goldthorpe and Portocarero (1979) typology which has about 7 categories depending upon the particular data and methods employed by the researcher. However, when studying administrative data which often provide much larger sample sizes, as many as 77 occupational categories have been used (Breen et al. 2016) although mainly for exploratory purposes. For cross-national studies comparing mobility tables across countries, an additional subscript may be added to the model (i.e., k) and national differences may be summarized by an additional shift parameter (one for each nation) which yields the log-multiplicative layer-effect model that is also known as the uniform-difference model (Erikson and Goldthorpe 1992).

The economic approach is simple in terms of modeling but relatively demanding in terms of its measurement requirements; it is based on OLS bivariate regression but requires data on long-term incomes. By contrast, the sociological approach is simpler in terms of measurement requirements but comparatively complex in terms of its modeling of contingency tables; it uses only data on the cross-sectional occupation of the respondent and retrospective data on the occupation of the respondent's parent's occupation.

Limitation #1: Being a Contextual Variable, Occupation is an Imprecise Indicator of an Individual's Socioeconomic Attainment

Occupation or class category refers to a grouping of different jobs classified according to some similarity in the "primary" work duties and employment relations reported by a respondent. Especially when aggregated to a half-dozen or so broad categories (i.e., similar to 1-digit occupational categories), the vast majority of earnings inequality is within the categories (Katz and Autor 1999; Kim and Sakamoto 2008). As wage inequality has grown, most of the growth is within one-digit occupations (Juhn,

Murphy, and Pierce 1993; Kim and Sakamoto 2008). For this reason, knowing a person's occupational category does not very accurately predict the earnings of the person in that category because the categories are so heterogeneous in terms of wages and earnings.

As emphasized by Hodge (1981), a measure of prestige or socioeconomic status for a given occupation is a contextual variable in the sense that within any given occupational category there is considerable variation in the wages and actual working conditions across individual workers. Measures of prestige or socioeconomic status are derived by some sort of averaging of the characteristics of the incumbents classified into a particular occupation, but that average inadequately reflects the socioeconomic circumstances of the individual workers who significantly deviate from the mean. As earnings inequality continues to grow, occupation-specific averages become increasingly less informative of any particular individual's socioeconomic outcomes. Thus, relying on occupation to indicate socioeconomic circumstances ignores within-occupation inequality which constitutes most of the total variance in earnings.

The strategy promoted by proponents of the study of occupations has been to increase the number of occupational categories in order to reduce the variance within any particular category. For example, Weeden and Grusky (2005:186) use 3-digit occupational codes to propose a classification of 126 "micro-classes" claiming that they "are institutionalized through various closure-generating mechanisms…." Investigating hourly wages using data on weekly earnings from the Current Population Survey (CPS), Weeden, Kim, Di Carlo, and Grusky (2007) nonetheless report that most of the total variance is within detailed occupations. Similar conclusions are reported in related analyses by Katz and Autor (1999), Kim and Sakamoto (2008) and Mouw and

Kalleberg (2010) using hundreds of 3-digit occupations in the CPS.[5] Thus, there is widespread agreement that most wage inequality is within occupations even at the detailed occupational level.

In general, 3-digit occupational categories can also be quite heterogeneous in terms of actual job characteristics (Jencks, Perman and Rainwater 1988). "Both the chairman of IBM and the manager of a local typewriter repair store fall into the category 'salaried manager: business services,' for example, while both James Reston and an obituary writer for a local paper fall into the category "editor and reporters,' and both a U.S. Supreme Court justice and a traffic court judge fall into the category 'judges'" (Jencks, Perman and Rainwater 1988:1325). The theoretical assumption that detailed occupation is the all-encompassing source of labor market segmentation that affects wages also seems exaggerated (Sakamoto and Wang 2017).

Weeden et al. (2007) and Mouw and Kalleberg (2010) argue that proportion of the total variance in log wages that is between occupations has been increasing in recent decades. That claim, however, is probably overstated (Sakamoto and Wang 2017). In addition, assessing the net causal effects of occupation on overall inequality in the entire distribution of wages is a separate issue from the extent to which an individual's occupation alone correlates highly with an individual's earnings. The decompositions used by Weeden et al. (2007) and Mouw and Kalleberg (2010) do not isolate the between-occupational component that is due to changing occupational composition versus changing occupation-specific rates of inequality. Some "polarization" of the occupational distribution (Acemoglu and Autor 2011) seems to have taken place during the 2000's (i.e., the time period emphasized by Weeden et al. [2007] and Mouw and

[5] The methodological procedures and model specifications used by Weeden et al. (2007) and by Mouw and Kalleberg (2010) probably lead to an overestimation of the causal effects of occupation on wages (Sakamoto and Wang 2017).

Kalleberg [2010]). In regard to using occupation to predict an individual's wage, only the occupation-specific variances (i.e., within-occupational inequality) are relevant, and no evidence indicates that they are declining (Katz and Autor 1999; Kim and Sakamoto 2008; Acemoglu and Autor 2011).

Building on prior work by Blanden, Gregg, and Macmillan (2013), Breen et al. (2016:43) show that the relationship between occupational mobility tables and the economic model can be derived from the following equation for the respondent's parent's income

$$Y_{ip} = \bar{Y}_p + \sum_j b_{jp} x_{ijp} + e_{ip} \quad (4)$$

combined with the analogous equation for the respondent's own (i.e., offspring's) income:

$$Y_{io} = \bar{Y}_o + \sum_j b_{jo} x_{ijo} + e_{io} \quad (5)$$

where p refers to parents while o refers to the offspring; Y_i refers to income; j denotes the occupations (or classes); x_{ij} are dichotomous variables indicating occupation; the b_j refers to the occupation-specific mean income expressed as a deviation from overall mean incomes, $\bar{Y}_p$ and $\bar{Y}_o$; and e_i is a residual uncorrelated with occupation and refers to within-occupation variation in income.

After expressing equations 4 and 5 in terms of matrix notation, the covariance between the incomes of parents and their offspring is:

$$cov(Y_p Y_o) = \boldsymbol{b}_p' M \boldsymbol{b}_o + cov(e_p e_o) + \boldsymbol{b}_o' cov(e_p x_o) + \boldsymbol{b}_p' cov(e_o x_p). \quad (6)$$

As discussed by Breen et al. (2016:45), M is equivalent to the occupational mobility table (albeit normed by dividing by the total sample size to yield the overall joint probability distribution). Dividing equation 6 by the standard deviations for parents and offspring (i.e., σ_p and σ_o, respectively) would then be equal to the correlation which

would also be equivalent to equation 2.[6]

Equation 6 reveals that the portion of the intergenerational income correlation (i.e., ρ from equation 2) that is identified by occupational mobility is equal to $\boldsymbol{b}_p' M \boldsymbol{b}_o / \sigma_p \sigma_o$ (Breen et al. 2016:44). Thus, the economic model would yield different conclusions from the occupational mobility table to the extent that the other part of equation 6 (i.e., $cov(e_p e_o) + \boldsymbol{b}_o' cov(e_p x_o) + \boldsymbol{b}_p' cov(e_o x_p)$) is large. Of those terms, the latter two refer to sources of intergenerational income immobility due to offspring with higher-income parents having higher incomes within any given occupation. The remaining term (i.e.,$cov(e_p e_o)$) refers to additional sources of intergenerational income immobility due to offspring with higher-income parents having higher incomes even though the two generations have different occupations.

As discussed by Breen et al. (2016:55), prior research on the U.S. finds that it is "a relatively equal country in terms of social [or occupational] mobility, but highly unequal in terms of income mobility." The sources of this discrepancy derive from the myriad of factors that can lead to a large ($cov(e_p e_o) + \boldsymbol{b}_o' cov(e_p x_o) + \boldsymbol{b}_p' cov(e_o x_p)$) in the U.S. labor market. The first is the increasingly direct effects of education (in both its vertical and horizontal dimensions) net of occupation. These direct effects are likely quite correlated with parental incomes and socioeconomic origins (Gerber and Cheung 2008; Torche 2011; Sakamoto and Kim 2012; Reardon 2011; Kim, Tamborini, and Sakamoto 2015; Sakamoto and Wang 2017). There is also evidence of the direct and indirect effects of measures of cognitive skill and non-cognitive skills that are more likely to be fostered by high-income parents (Heckman 2006; Blanden, Gregg, and Macmillan 2007; Ermisch, Jantti, and Smeeding 2012; Heckman and Mosso 2014;

[6] If equation 6 were expressed in terms of log incomes and then divided by the variance of parent's log income, then the IGE (i.e., β from equation 1) would be obtained.

Mazumder 2014; Sakamoto, Rarick, Woo and Wang 2014). As stated by Breen et al. (2016:56), "the residual income correlation (not involving class in either generation) is high, suggesting that characteristics of fathers that vary within classes have a strong effect on sons' incomes." Heckman and Mosso (2014:689) go so far as to claim that "At least 50% of the variability of lifetime earnings across persons results from attributes of persons determined by age 18" with parental skills and family income being the crucial determinants of those attributes.

In regard to the mediating factors with which these attributes are likely to be associated in the labor market, firm rents probably affect wages in the U.S. more than in some European societies where centralized bargaining through unions is widespread (Lane 2009; Card, Heining and Kline 2013; Breen et al. 2016). According to Handwerker and Spletzer (2016:174), between firm differentials substantially increased as a proportion of total wage inequality in the U.S. from 1998 to 2010. Similar results are provided by Barth, Bryson, Davis, and Freeman (2016:S67) who conclude that "much of the 1970s–2010s increase in earnings inequality results from increased dispersion of the earnings among the establishments where individuals work. Our results direct attention to the role of establishment-level pay setting…."

However, declining internal labor markets institutions (of both the firm and occupational variety) have heightened the significance of employee bargaining power in the U.S. in recent decades (Cappelli 1999; Jacoby 2001; Kalleberg 2009; Tomaskovic-Devey 2014). Employee bargaining power is in part enhanced when employees' skills and credentials are well matched in terms of enhancing the productivities of their firms (Jacobs 1981; Sakamoto and Wang 2017). Earnings inequality is increased when employees with significant bargaining power are well matched in firms with high rents (Liu, Sakamoto and Su 2010; Tomaskovic-Devey and Lin 2011; Sakamoto and Wang

2017). "In this new institutional context, wage inequality is more directly affected by the confluence of employee bargaining power and employer ability-to-pay than by the regulated pay disparities organized around traditional occupational distinctions" (Sakamoto and Wang 2017:181).

The earnings differential between whites and African Americans is not mostly explained by occupation (Featherman and Hauser 1978; Farley 1996; Grodsky and Pager 2001). Similarly, occupation explains only a small portion of the wage gap between men and women (Blau and Kahn 1994; Sakamoto and Kim 2010; Murphy and Oesch 2016). Women are actually not disadvantaged in their occupational returns to schooling because women are more likely to be employed in white-collar jobs (which tend to be ranked higher than blue-collar jobs which employ more men) despite the much lower wages of women compared to men (Sewell, Hauser, and Wolf 1980; Farley 1996; Sakamoto and Kim 2010).

Regarding intergenerational mobility per se, Breen et al. (2016:56) find that a 5-class schema based on the Erikson, Goldthorpe and Portocarero typology actually explains more of the IGE between parents and daughters than does a 77-categorization of Weeden-Grusky "micro-classes." Breen et al. (2016:56) interpret this finding as being "predominantly an effect of occupational gender segregation, which leads to a mismatch of fathers' and daughters' occupations, meaning that the micro-class mobility table is more erratic for the father-daughter combination, and so accounts for less of the income correlation than the five-class mobility table."

In sum, occupational categories typically harbor a great deal of underlying organizational variability, firm heterogeneity, and earnings inequality. Using some sort of occupational average to indicate an individual's earnings is thus highly imprecise. Occupational mobility tables are unable to discern substantial economic immobility that

persists within any given occupational category. Furthermore, the parent-offspring income correlation can be high even when the two generations have different occupations because most earnings inequality derives from other variables. The economic approach avoids this shortcoming of contextual imprecision by measuring incomes directly at the individual level for both parents and offspring.

Limitation #2: The Labor Market Has Become More Volatile and Current Occupation Does Not Adequately Predict Long-Term Incomes

Studies using occupational mobility tables have relied on cross-sectional data for the offspring's occupation and a cross-sectional though retrospective measure of parent's occupation when the offspring was growing up. To our knowledge, no study by a sociologist has addressed the issue of intra-generational occupational mobility in regard to its implications for analyzing intergenerational occupational mobility tables. Although not very clearly considered, the assumption seems to be that occupation as observed in cross-section is a reliable and valid (albeit presumably ordinal) measure of long-term earnings. As stated by a prominent figure in the study of intergenerational occupational mobility, "…there is a 'permanent' level of occupational status around which there are temporary fluctuations' (Hauser 2010:6). Thus, "one might regard occupational socioeconomic status as roughly equivalent to permanent income in studies of intergenerational mobility" (Hauser 2010:7).

As discussed by Brady (2015:8), "Class and occupation scholars often argue that their measures are superior to income or earnings…. For example, in their highly influential review of socio-economic indices for occupations, Hauser and Warren (1997:179) criticize others' concentration on current income, and claim occupation data suffer from fewer problems of refusal, recall, reliability, and stability." Hauser and Warren (1997:198) further conclude that "Occupational status may be a better indicator

of long-term – or, as economists call it, permanent – income than is income at a single point in time (Goldberger 1989; Zimmerman 1992).” Similarly, Torche (2015:346) states that “Occupational status is a one-dimensional hierarchy based on the mean education and earnings of each occupation’s incumbents, and it is claimed to provide a good proxy for long-term economic status, even better than single-year income or earnings….”

As mentioned earlier, a well-known approach is the class scheme of Erikson, Goldthorpe and Portocarero. Erikson and Goldthorpe (2002:34) state that their classification “serves as a good proxy for permanent income.” More recently, Goldthorpe (2016:91) has reiterated that an important justification of this approach is that it predicts “longer-term income prospects.”

Despite these pronouncements, we agree with Brady (2015:8) assessment that “to the best of our knowledge, there has been an absence of empirical evidence that class or occupation actually predict PI [permanent income] better than short-term economic resources.” Although widely cited by proponents of occupational mobility tables, Zimmerman (1992) is based on a fairly modest sample size for a few years of data on one cohort of men employed full-time in the older National Longitudinal Survey. The study by Goldberger (1989) is also often cited, but it does not investigate any real data at all and instead develops a formal, analytical model of intergenerational family influences. These two studies are too limited and outdated to constitute conclusive evidence that cross-sectional occupation accurately indicates long-term earnings for most of the labor force in the 21st century.

Indeed, a moment’s reflection suggests some inherent ambiguity with the assumption that cross-sectional occupation accurately indicates long-term earnings: what happens if a worker changes her occupation? Does her lifetime earnings thereby

change as well? Since a worker has only one work career (i.e., she has only one life), she cannot possibly have two different long-term earnings. Furthermore, for a worker who has changed her occupation, shouldn't her lifetime earnings be a function not only of her current earnings stream but also the one associated with her former occupation?

The assumption that cross-sectional occupation accurately indicates long-term earnings thus seems to harbor the additional premise that most workers rarely change their occupation to any significant degree. Perhaps this view of a stable occupational career was fairly applicable to many white men who worked full-time during the 1960's and 1970's when the occupational mobility tables were developing. Native born white males were the focus of several classic studies (e.g., Blau and Duncan 1967; Featherman and Hauser 1978).

In recent decades, however, the American labor market has become far more turbulent than in that older post-war period (Levy and Temin 2009; Carr and Wiemers 2016; Sakamoto and Wang 2017). As mentioned above, traditional internal labor markets are declining in the contemporary labor market (Cappelli 1999). The 21st century is characterized by heightened competition in product and capital markets, rapid technological change, corporate buyouts and mergers, globalized competition, outsourcing, firm restructuring, declining unionization, incentive pay schemes, declining returns to firm tenure, the shifting of risk from employers to employees, and macroeconomic downturns (DiTomaso 2001; Jacoby 2001: Kalleberg 2009; Bidwell, Briscoe, Fernandez-Mateo, and Sterling 2013; Dencker and Fang 2016; Sakamoto and Wang 2017). As stated by Cappelli (1999:17), the "old employment system of secure, lifetime jobs with predictable advancement and stable pay is dead." Instead, as acknowledged by Grusky et al. (2015:68), there is "the growing volatility of labor market experiences."

In the contemporary American labor market, direct evidence of rising intra-generational occupational mobility indicates that it is significant even at the 1-digit level (Kambourov and Manovskii 2008). Further analyses by Hollister (2011) reveal that intra-generational occupational mobility is higher among workers without a college degree in the U.S.[7] Labor force participation has declined and become more varied (Western and Pettit 2010; Smith 2011) which also relates to growing diversity in family forms in recent decades (Tach 2015; Bloome 2017).

Given this greater volatility in the contemporary labor market, the assumption that current or cross-sectional occupation accurately indicates long-term earnings is no longer tenable. Kim, Tamborini and Sakamoto (2018) investigate administrative data on total earnings accumulated over the 20-year period from 1990 to 2009 for a nationally representative sample of native born men with some at least some earnings during that period. Incorporating field of study into their measures of educational attainment, Kim, Tamborini and Sakamoto (2018:224-225) conclude that "contrary to common assumptions in the literature, the occupation-based independent variables observed in a cross-section have less notable net effects on long term earnings than other variables we examined. Despite the large expenditures in degrees of freedom, the predictive powers of three-digit occupation and the Weeden-Grusky typology are not higher than those of education and short-term earnings variables." That is, the models based on only demographic characteristics and education have better fit than models based on occupation and related categorizations.

For example, using dichotomous variables to indicate 405 3-digit occupations

[7] Intra-generational occupational mobility may be exaggerated due to measurement error (Fisher and Houseworth 2013) because distinguishing between closely related 3-digit occupations can be unreliable (e.g., computer programmers; software developers; applications and systems software developers; web developers; database administrators; computer systems analysts).

observed in cross-section, Kim, Tamborini and Sakamoto's (2018) regression of 20-year accumulated earnings for men has an R-squared of .30 and BIC of 17,282. The regression using only 1 year of cross-sectional earnings as the independent variable has an R-squared of .43 and BIC of 12,510. That is, 1 year of earnings predicts 20-year accumulated earnings much better than 405 3-digit occupations observed in cross-section even though the latter model uses 404 more regression degrees of freedom (contrary to the related analysis of Zimmerman [1992]). Similar results were obtained for women.

The inherent limitation with Weeden and Grusky (2005), Grusky and Weeden (2006), and Weeden et al. (2007) is that their statistical analyses focus exclusively on cross-sectional data. Class as "life chances" cannot be adequately ascertained using cross-sectional data because work careers and inequalities obviously extend beyond one year (Kim, Tamborini, and Sakamoto 2015; Kim, Tamborini and Sakamoto 2018). By attempting to reduce the internal heterogeneity of occupational categories by identifying many more of them at the detailed level, Weeden et al.'s (2007) analysis successfully increases the explained variance of wages using cross-sectional data, but their detailed categories become statistical liabilities when predicting long-term earnings because many workers change their detailed occupation over the course of their work career. Thus, Kim, Tamborini and Sakamoto (2018) find that models with 1-digit occupation have far lower BIC statistics than those with 3-digit occupation or Weeden and Grusky "micro-classes." From the point of view of understanding class as "life chances," the models of Weeden and Grusky (2005), Weeden et al. (2007), and Mouw and Kalleberg (2010) are likely "overfitting" cross-sectional data (Xie 1999).[8]

[8] In addition, occupational licensing has been a major theoretical justification for this approach, but recent research casts doubt on the assumption that licensing has significant effects on either increasing wages or restricting employment (Redbird 2017).

In the economic model, this shortcoming of relying on cross-sectional data is explicitly rejected. That is, equation 1 is specified to refer to long-term or lifetime (i.e., not cross-sectional) earnings. The economic approach is therefore not directly compromised by labor market volatility or increasing intra-generational occupational mobility because no assumption is made about cross-sectional measures being adequate indicators of "life chances."

To be sure, measuring long-term earnings is not an easy task and few publicly available data sets can provide such information.[9] However, by explicitly recognizing the research concern of focusing on long-term earnings, the economic approach facilitates improved measurement as is illustrated by the literature on "lifecycle bias" and attenuation bias when estimating IGE (Black and Devereux 2011). In addition, the increasing use of administrative data is enhancing access to information on long-term earnings (Grusky et al. 2015; Kim, Tamborini and Sakamoto 2018).

Limitation #3: The Distinction between Structural Mobility and Circulation Mobility is Dubious and Uninformative

Traditional analyses of mobility tables rest on the assumption that changes in the marginal distributions of the occupational categories are due to factors or causal processes that are exogenous to the level and patterns of relative mobility as indicated by the odds ratios. This assumption underlies the division of total mobility into two components: structural mobility and circulation mobility. The latter term is a generic name for relative mobility.

Featherman and Hauser (1978:70) state that, "Structural mobility (sometimes

[9] Regarding the measurement of cumulative long-term earnings, 0 earnings in any given year can be treated as a real and meaningful number (e.g., Kim, Tamborini, and Sakamoto 2015) in contrast to occupation which is not appropriately defined in terms of socioeconomic rewards if one is unemployed or out of the labor force.

called minimum mobility) is just the index of dissimilarity between the distribution of father's occupation and that of son's occupation. It may be interpreted as the percentage of the count in the mobility table that necessarily lies off the main diagonal by virtue of the difference between the row and column marginal distributions. Circulation mobility is the difference between the overall percentage of cases off the main diagonal and the percentage structurally mobile." As explained by Sobel (1983:721), "Circulation (pure, exchange) mobility, operationally defined as a residue, represents that mobility which occurs over and above the mobility necessitated by changes in the occupational structure."

From a more theoretical point of view, Torche (2015:41) states that "Structural mobility is interpreted as a consequence of exogenous economic and demographic factors such as technological change, economic policy, foreign trade, fertility and immigration…." By contrast, relative mobility (or circulation mobility) "refers to the association between origins and destinations, net of structural change. Relative rates of mobility indicate the level of social fluidity or "social openness" or the degree of "equality of opportunity" in a society….Free from marginal effects, odds ratios express the competition between different people with different origins to attain diverse classes of destination."

In terms of the modeling of the frequencies in the occupational mobility table, the structural mobility component of equation 3 is represented by τ_i and τ_j in equation 3. These are the main effects of origin and destination which derive from the marginal distributions of occupation for the two generations. Circulation mobility is indicated by the τ_{ij} which refer to the patterns of relative mobility that derive from the frequencies which remain to be explained after τ_i and τ_j have factored out

structural mobility.[10]

Although the interpretation of this type of modeling approach has been standard in this field for decades (e.g., Featherman and Hauser 1978), Sobel (1983:721) argued that the conceptual distinction between structural mobility and circulation mobility is inadequate, and that "investigators should abandon the 'structure vs. circulation' framework in future work." We concur with his conclusion that "the theoretical concept of structural mobility remains at best a vague abstraction" (Sobel 1983:722). Expanding upon Sobel's discussion, we argue more explicitly that structural mobility is not exogenous to the level of "social fluidity" or "social openness." That is, a higher level of circulation mobility that makes more optimal use of human capital and productive talent *thereby* affects the level of structural mobility by improving economic productivity which leads to occupational change.[11]

For example, in some Middle Eastern countries with low population growth due to restricted immigration but high levels of foreign exchange obtained through the export of oil, the increased educational attainment of women in recent years has been underutilized in the economy due to highly traditional norms about women's social roles and extremely high levels of gender segregation in the labor force (Doumato and Posusney 2003). This underutilization reduces productivity and economic growth that would otherwise have occurred had the labor market allocated human resources in a more gender-neutral fashion. Reduced economic growth then results in some stagnation of the occupational structure. Because the efficient allocation of skilled labor

[10] While this has been the standard modeling approach, a few exploratory exceptions may be found in the literature (Hauser 1980; Breiger 1981).

[11] As stated by Blau and Duncan (1967:431), "The great potential of society's human resources can be more fully exploited in a fluid class structure with a high degree of mobility than in a rigid social system….Universalistic principles have penetrated deep into the fabric of modern society and given rise to high rates of occupational mobility in response to this need."

enhances economic productivity, structural mobility is not purely exogenous and entirely independent of the degree of "social openness" or "equality of opportunity" in a society.[12]

Racial discrimination also probably dampens economic growth due to the inefficient use of human resources. A simple example is native-born Asian Americans before the Civil Rights era who achieved high levels of college attainment during a time period when high-educated workers were in short supply. Although many native born Asian Americans were highly motivated and educated for professional and managerial careers during that era, racial discrimination often prevented them from obtaining such positions (Thomas, Kikuchi, and Sakoda 1952; Sakamoto and Furuichi 1997; Sakamoto, Liu and Tzeng 1998). Lesser skilled or lesser motivated white workers were typically hired instead or the position would remain unfilled while many Asian Americans with college degrees would end up working in "the fruit stands in the Los Angeles produce markets" (Kitano 1976:91). This reduction in efficiency diminishes economic productivity and growth by the underutilization of human resources.[13]

In the antebellum American South, the institution of slavery created an extreme form of the intergenerational reproduction of a low-income population of African Americans who were economically exploited by their white masters (Wilson 1978). However, the slave system also substantially retarded the development of agricultural production and ultimately the entire economy of the South (Genovese 1965). In the postbellum American South before the Civil Rights era, the extreme level of discrimination against African Americans through the Jim Crow legal code undoubtedly

[12] Doumato and Posusney (2003:1) state that "for the vast majority of college-educated women, Saudi Arabia remains a land of unemployment…."

[13] Thomas et al. (1952:41) ironically describes how many Japanese Americans with college and other degrees got their first opportunities to exercise their vocational preferences while working inside internment camps during World War II.

resulted in the underutilization and misallocation of human resources and productive talents (Levy 1998). During that time period, wages and earnings continued to stagnate in the South (even among whites), and economic growth in the South still lagged far behind the North which undoubtedly also affected the occupational structure (Wilson 1978; Levy 1998). Only decades after the dismantling of Jim Crow has the South recently begun to catch up with the North in terms of wages, living standards and economic growth (Farley 1996; Levy 1998).[14]

In addition to being theoretically dubious, the attempted division of mobility into exogenously-induced structural mobility versus "social openness" circulation mobility is inexpedient and unnecessary. Any instance of mobility is relevant to assessing "social fluidity" in a society regardless of whether its sources are deemed to be "structural" or based on "circulation" processes. Nor is it clear that individuals who experience mobility recognize or care about such abstract distinctions. While measures of total mobility and related mobility indices have been developed, in practice they have proven difficult to compare across different mobility tables (Featherman and Hauser 1978:71; Sobel 1983:725).[15]

The economic approach avoids any assumptions about structural mobility versus circulation mobility. The estimation of the IGE reflects the extent to which any individuals are mobile regardless of the presumed macro-level causal sources. As a

[14] From a more theoretical perspective, Breen (1997)'s formal analysis demonstrates how social and occupational mobility can improve economic efficiency in the succeeding generation. Relatedly, from a traditional microeconomic perspective, the inefficient allocation of labor leads to reduced productivity relative to the "production possibility frontier" (Pindyck and Rubinfeld 2003:581).

[15] Hauser (1978) emphasizes the insights of occupational mobility tables in regard to distinguishing particular patterns of transitions across categories. However, this type of concern can also be analyzed in terms of categories of income percentiles or nonlinearities in the ICG (e.g., Mazumder 2014; Mitnik et al. 2015).

descriptive measure, the IGE is thus more informative and intuitively comprehensible.

Limitation #4: The Occupational Mobility Approach Has Failed to Identify Important Empirical Trends in Stratification and Inequality

Occupational mobility tables have also been ineffective in identifying and analyzing important empirical trends and issues. First and foremost, rising income inequality is widely recognized as one of the most important trends in recent years (Krugman 2012; Stiglitz 2015). The level of inequality in the U.S. has become so notable that concerns have been raised about its consequences for exacerbating social problems (Wilkinson and Pickett 2009). Excessive income inequality has become a major political issue even though inequality used to be dismissed as useless rhetoric about "class warfare" (Krugman 2011).

Unfortunately, occupational structure in the U.S. seems unable to identify this critical trend towards the "new Gilded Age" (Krugman 2014). Based on data from various Integrated Public-Use Microdata Sample (IPUMS) data from the U.S. Census Bureau, Figure 1 shows the ratio of the 90th percentile to the 10th percentile (P90/P10) in the annual wage (i.e., annual earnings adjusted for hours worked during the year) from 1970 to 2013. Due to methodological issues regarding the measurement of earnings across these various surveys, these results should not be viewed as extremely precise. Nonetheless, the trend in Figure 1 for the P90/P10 for the annual wage is clearly sloping upward beginning at around a value of 7 at the start of the period in 1970 to about a value of 9 at the end of the period in 2013. This rise in wage inequality is of course entirely consistent with many prior studies finding similar and related trends about income (e.g., Juhn et al. 1993; Kim and Sakamoto 2008; Acemoglu and Autor 2011; Stiglitz 2015).

Using the same samples of individuals in the IPUMS data over this time period,

Figure 1 also shows the P90/P10 for various measures of occupational status or socioeconomic index score that are based on 3-digit occupation including the Hauser and Warren's socioeconomic index, the Nam-Powers-Boyd occupational status, the Nakao-Treas occupational prestige, the 1990 occupational earnings, and the 1990 occupational education.[16] For each of the measures, Figure 1 shows that the P90/P10 is much smaller (no more than about 5) than that for the annual wage at the end of the period.[17] Interestingly, however, at the beginning of this time period the P90/10 for the annual wage was about the same as that for 1990 occupational earnings while it was actually considerably lower than 1990 occupational education.[18]

More importantly, for each of the measures, a rising trend over this time period is not at all evident in contrast to that for the annual wage.[19] That is, increasing P90/P10 inequality in the annual wage is not at all discernible by P90/P10 inequality in any occupational status score (which is consistent with our earlier discussion about rising inequality being largely within occupations). Indeed, for several of these measures, the trend is actually slightly downward indicating that P90/P10 inequality declined over this period. Inequality in occupational status (however measured) has

---

[16] These occupational measures are described at https://usa.ipums.org/usa/chapter4/chapter4.shtml. Retrieved September 17, 2016.

[17] Annual wage here refers to annual earnings divided annual hours worked. These results are based on the 5 percent IPUMS files from the decennial censuses from 1970 to 2000, and on the American Community Survey thereafter.

[18] As discussed by Allison (1978), occupational socioeconomic indexes are not ratio-level measures. For this reason, parametric measures of dispersion or inequality would not be reliable. However, P90/P10 is a non-parametric indicator and is thus appropriate for ordinal variables (such as occupational socioeconomic status) as well as parametric measures (such as the annual wage).

[19] Cross-sectional data on annual earnings and wages may somewhat understate inequality in long-term earnings (Cheng 2014; Sakamoto, Tamborini and Kim 2018) due to cumulative advantage in earnings trajectories (at least for more recent cohorts) which apparently slightly outweighs the equalizing effect of transitory annual variability (cf. Breen and Chung [2015:459] who state that "Estimates of inequality based on incomes from a single year will be upwardly biased.").

been incapable of detecting rising earnings inequality which is widely agreed as being one of the most notable challenges to the contemporary stratification system (Krugman 2014; Stiglitz 2015).

Relying on the distinction between structural mobility versus relative mobility has encouraged overly simplistic generalizations about the relationships about intergenerational mobility and economic growth. For example, Hout (2015:29) claims that "mobility is symmetrical in the absence of growth" and that "mobility occurs when the correlation between origins and destinations is less than perfect….Noting that growth pushes upward invites us to think about the ways in which growth might promote upward mobility." In other words, because economic growth is assumed to increase the proportion of higher status occupations, then economic growth should be a major cause of upward mobility due to greater structural mobility. Beller and Hout (2005:20) more explicitly argue that "mobility is also high if growth is strong….in President John F. Kennedy's famous phrase—a rising tide lifts all boats." As stated by Torche (2015:43), "relative class mobility…accounts for a small portion of the total mobility experienced by individuals across generations, while structural mobility accounts for most of it…."

However, recent trends in economic growth have been concentrated in the top quintile of the distribution of household income (Blank, Card, Levy, and Medoff 1993; Iceland 2006; Economic Policy Institute 2014). After adjusting for inflation, the incomes of the families in the bottom four quintiles (i.e., the bottom 80% of the distribution) actually declined between 2007 and 2013 (Economic Policy Institute 2014). Up until the time that John F. Kennedy made the above statement, the poverty rate did negatively correlate with economic growth (Iceland 2006:74) but since then poverty, median household income, and income inequality have not been ameliorated by

rising economic growth (Blank et al. 1993; Economic Policy Institute 2014).

The tendency of sociologists to view economic growth as promoting more intergenerational mobility may be understandable when growth is assumed to promote structural mobility by reducing the proportion of agricultural and blue-collar jobs in the economy. When focused more on income as the socioeconomic outcome of interest, however, the presumption that economic growth usually promotes more social fluidity and greater societal openness is at odds with the economic reality that "the rich are getting richer and the poor are getting poorer" (Kim and Sakamoto 2008:129). The study of occupational mobility focuses on the distinction between structural mobility versus relative mobility, but this model has thus encouraged overly simplistic thinking about the relationships between economic growth and socioeconomic reproduction in contemporary society.

Relatedly, the occupational mobility approach has failed to identify or even recognize the "Great Gatsby Curve" (GGC) which, as mentioned earlier, refers to the negative correlation between income inequality and intergenerational income mobility. As also argued above, the occupational mobility approach has difficulty identifying rising income inequality so the inability to discern its correlation with intergenerational mobility is not surprising. Summarizing the sociological literature on trends in relative mobility is difficult due to the lack of consensus, but using the uniform-difference model and the Erikson, Goldthorpe and Portocarero typology, Erikson and Goldthorpe's (1992) findings do not much support the expected pattern according to the GGC. For example, they find Germany and the Netherlands to be more immobile than the U.S. despite the well-known fact that income inequality is much higher in the latter country.

Another example is Torche (2005:422) who contends that "Despite vast economic inequality, Chile is as fluid, if not more so, than the much more equal

industrialized nations." Her conclusion about Chile being more "fluid" than such countries as Sweden and France rests on a traditional occupational mobility analysis of circulation mobility as the residual after parceling out structural mobility. However, not only is Chile characterized by extreme income and wealth inequality (Torche 2005:428) but the correlation between parents and offspring in regard to years of schooling is .60 which is one of the highest in the world (Black and Devereux 2011:1506). Given this high intergenerational correlation in education, and given the salience of education for both income and occupational attainment, we are skeptical of the claim that Chile is more "fluid" than Sweden where the correlation is lower at .4.

Furthermore, the GGC seems analytically consistent with micro-level models of intergenerational mobility including those of Becker-Tomes (1979) and Breen-Goldthorpe (1997). In the case of the former model, increased income inequality implies a larger gap in the parental resources available for the investment in the human capital development of wealthier children versus poorer children. This increased gap then widens the relative disadvantage of poorer children (in comparison to wealthier children) to be competitive in the labor market. In the case of the Breen-Goldthorpe model, reduced income inequality is often associated with a lower probability of falling into the low-income group (i.e., the "underclass" [Breen and Goldthorpe 1997:281]) which then implies reduced social class differentials in "relative risk aversion" (Breen and Goldthorpe 1997:281) that should result in greater intergenerational mobility. Although Torche (2015b:363) suggests without a coherent argument that the GGC is "spurious," reduced intergenerational mobility seems consistent with micro-level models of rising class inequality (Tumin 1953:393).

Additional evidence is provided by Sakamoto, Rarick, Woo and Wang (2014) who review studies from psychology and behavioral economics. Sakamoto et al. (2014)

argue that a significant portion of cross-national variation in intergenerational mobility is due to differences in the level of relative poverty. The latter is described as decreasing psychological resources which compromises the competitiveness of low-income persons for superior attainment in the educational system and for greater productivity in the labor market. Economic deprivation in itself leads to a "vicious circle" of disadvantage that diminishes intergenerational mobility even without the existence of any culture of poverty or monopolistic institutions in the economy. This process supports the GGC as a generic phenomenon.

In sum, the methodological problems associated with occupational mobility tables have largely disabled them from discerning clear conclusions about rising inequality or major societal differences in intergenerational reproduction. While ambiguous results about empirical trends might have been interpreted as evidence for methodological problems generating random error, researchers in this field have instead concluded that mobility is simply characterized by "trendless fluctuation" or a "constant flux" (Featherman, Jones, and Hauser 1975; Erikson and Goldthorpe 1992). Net of the level of economic development, societies were simplistically described as being essentially similar in regard to intergenerational mobility (Featherman, Jones, and Hauser 1975).

Limitation #5: Occupation Is Defined in Terms of Primary Job Duties Rather than Non-Pecuniary Rewards and Compensating Differentials

Many people may value not only the monetary rewards but also the non-pecuniary aspects of a job (Jencks, Perman and Rainwater 1988). The latter may include such characteristics more pleasant working conditions, stress level, managerial authority or prestige, work autonomy, flexibility in work schedule, training and promotion opportunities, job security, or better fringe benefits such as health care insurance. An

often stated potential advantage of the occupational approach is that occupational measures may be better able to indicate not only the monetary rewards associated with a job but also its non-pecuniary benefits (Blau and Duncan 1967; Hauser and Featherman 1977; Jencks, Perman and Rainwater 1988; Hauser and Warren 1997).

However, when studying actual data on the characteristics of specific jobs, Jencks, Perman and Rainwater (1988:1325-1327) find that the explanatory power of occupation is quite modest. As stated by Jencks, Perman and Rainwater (1988:1328), "Many job characteristics that are important to workers vary with the organizational setting in which work occurs. Occupational classifications seldom take organizational settings into account, so they do not capture much of the variation in these jobs characteristics. Since measures of occupational status take occupations as their building blocks, they can never hope to capture the effects of job characteristics that vary mostly within occupations."

Another issue is that workers may vary considerably about how much value they place in particular job characteristics. A person with extensive child-care or family responsibilities might value "decides own hours" of work much more than a person without such responsibilities (Jencks, Perman and Rainwater 1988:1336). Other workers may value working for a particular non-profit company for specific political, religious, philanthropic or other service-oriented satisfactions (Benz 2005) that could vary widely by individual. In addition, the empirical significance of compensating differentials may be somewhat overstated if better working conditions tend to be correlated with higher wages (Kilbourne, England, Farkas, Beron, and Weir 1994) and if the non-pecuniary rewards to employment may be declining in recent years (Kalleberg 2011).

An alternative rationale for occupational models could be based on prestige in

the sense of “entitlements to deference” (Shils 1968:107). This approach is inherently social psychological in being based on how people tend to *perceive* the cultural desirability of occupations (Hodge, Siegel and Rossi 1964). The tradition in this area of research, however, has been to dismiss the social psychological evaluation of occupations as being of independent significance because “prestige scores are ‘error prone’ estimates of the socioeconomic attributes of occupations” (Featherman and Hauser 1976:405) and other closely related arguments (Treiman 1977).

Wallace and Brady 2001

Conclusion: The Declining Significance of Occupational Mobility Tables

The topics, issues, and data sets investigated by sociologists and economists overlap in many areas of research (e.g., labor markets, discrimination by race and gender, family structure, fertility, criminology, health, retirement, organizational structure, economic development). In most of these areas, sociological models have not simply ceded to the economic approach. The study of intergenerational mobility is distinctive because most sociologists are abandoning occupational mobility tables—despite their once great popularity—in favor of economic models.

Rather than reflecting inexplicable fickleness, this switchover is made understandable by our discussion that clarifies the significant limitations of occupational mobility tables which hitherto have not been adequately recognized and which do not hinder the economic model. The first limitation is contextual nature of occupation which provides an increasingly imprecise indicator of the individual’s earnings or other socioeconomic outcomes. The second limitation is the lack of focus on long-term earnings and the continued reliance on cross-sectional data in an era of increased labor market volatility. The third limitation is the dubious practice of partitioning mobility

into structural-mobility versus circulation-mobility and focusing on primarily the latter to make generalizations about the level of opportunity and social fluidity in society. The fourth limitation is the failure of occupational models to discern important empirical trends (such as rising earnings inequality and the Great Gatsby Curve) which casts further doubt on the occupational approach. The fifth limitation is that occupation is defined in terms of primary job duties and thus is an accurate portrayal of compensating differentials.

While the economic approach is not encumbered by any of these limitations, we do not mean to imply that estimating the IGE is without methodological challenges (Black and Devereux 2011). In particular, obtaining reasonable measures of the long-term earnings of offspring and their parents can be a daunting task. We only argue that the economic approach provides an overall more fruitful modeling strategy than that provided by the traditional analysis of occupational mobility tables. Given the switchover that sociologists seem to be making towards the economic approach (despite the perceived lack of disciplinary "loyalty"), its advantages are likely considerable.

In conclusion, we believe that the usefulness of many sociological perspectives for enhancing social scientific knowledge about inequality are not in danger of waning anytime soon. We only argue that, in the particular case of the quantitative analysis of intergenerational mobility, occupational mobility tables are becoming less popular than the economic model because the latter is far more informative. True social scientists should welcome this advance in methodology and cumulative knowledge, however, since "a science which hesitates to forget its founders is lost" (Whitehead 1916:413).

If occupational mobility tables are to remain useful in some way, then future research will need to clarify how occupational or social class background net of long-term income provides some sort of socioeconomic insight or explanatory power.

Perhaps one avenue for future development would be to focus more specifically on the reproduction of class circumstances or sub-cultures that affect educational decision making (Breen and Goldthorpe 1997). Psychological factors associated with socioeconomic attainment and class sub-cultures might also be relevant (Sakamoto, Rarick, Woo and Wang 2014). Another approach might be to try to incorporate occupation or job information measured in terms of compensating differentials as supplementary information to be combined somehow with income as an indicator of total socioeconomic attainment (Jencks, Perman and Rainwater 1988). We any event, we stress the future research should explicitly clarify analytical concepts and causal processes rather than justify the use of occupation simply because that is the custom among sociologists (Torche 2015:38).

References

Acemoglu, Daren, and David Autor. 2011. "Skills, Tasks and Technologies: Implications for Employment and Earnings." Pp. 1043-1171 in *Handbook of Labor Economics, Volume 4B* edited by Orley Ashenfelter and David Card. New York: Elsevier.

Allison, Paul D. 1978. "Measures of Inequality." *American Sociological Review* 43:865-880.

Barth, Erling, Alex Bryson, James C. Davis, Richard Freeman. 2016. "It's Where You Work: Increases in the Dispersion of Earnings across Establishments and Individuals in the United States." *Journal of Labor Economics* 34:S67-S97.

Becker, Gary S., and Nigel Tomes. 1979. "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility." *Journal of Political Economy* 87:1153-1189.

Beller, Emily, and Michael Hout. 2006. "Intergenerational Social Mobility: The United States in Comparative Perspective." *The Future of Children* 16:19-36.

Benz, Matthias. 2005. "Not for the Profit, but for the Satisfaction? Evidence on Worker Well-Being in Non-Profit Firms." *Kyklos* 58:155-176.

Bidwell, Matthew, Forrest Briscoe, Isabel Fernandez-Mateo, and Adina Sterling. 2013. "The Employment Relationship And Inequality: How and Why Changes in Employment Practices Are Reshaping Rewards in Organizations." *The Academy of Management Annals* 7:61-121.

Black, Sandra, and Paul J. Devereux. 2011. "Recent Developments in Intergenerational Mobility." Pp. 1487-1541 in *Handbook of Labor Economics, Volume 4B* edited by Orley Ashenfelter and David Card. New York: Elsevier.

Blanden, Jo, Paul Gregg, and Lindsey Macmillan. 2007. “Accounting for Intergenerational Persistence: Non-cognitive skills, Ability and Education.” *Economic Journal* 117:C43-C60.

Blanden, Jo, Paul Gregg, and Lindsey Macmillan. 2013. “Intergenerational Persistence in Income and Social Class: The Effect of Within-Group Inequality.” *Journal of the Royal Statistical Society* 176:541–63.

Blank, Rebecca M., David Card, Frank Levy, and James L. Medoff. 1993. “Poverty, Income Distribution, and Growth: Are They Still Connected?” *Brookings Papers on Economic Activity* 1993:285-339.

Blau, Francine D., and Lawrence M. Kahn. 1994. “Rising Wage Inequality and the U.S. Gender Gap.” *American Economic Review* 84:23-28.

Blau, Peter M. and Otis D. Duncan. 1967. *The American Occupational Structure.* New York: John Wiley and Sons.

Bloome, Deirdre. 2014. “Racial Inequality Trends and the Intergenerational Persistence of Income and Family Structure.” *American Sociological Review* 79:1196-1225.

Bloome, Deirdre. 2017. “Childhood Family Structure and Intergenerational Income Mobility in the United States.” *Demography* 54:541.

Bloome, Deirdre and Bruce Western. 2011. “Cohort Change and Racial Differences in Educational and Income Mobility.” *Social Forces* 90:375-395.

Bloome, Deidre and Xiang Zhou. 2017. “Educational Inequality, Educational Expansion and Intergenerational Income Mobility in the United States.” Paper to be presented at the 2017 Annual Meeting of the Population Association of America. Chicago, Illinois.

Brady, David. 2015. “How to Proxy Permanent Income: Evidence from Germany and the U.S.” Paper presented at the 2015 annual meeting of the Association for Public Policy Analysis and Management, Miami, FL.

Breen, Richard, and Inkwan Chung. 2015. “Income Inequality and Education.” *Sociological Science* 2:454-477.

Breen, Richard, and John H. Goldthorpe. 1997. “Explaining Educational Differentials: Towards a Formal Rational Action Theory.” *Rationality and Society* 9:275-305.

Breen, Richard, Carina Mood, and Jan O. Jonsson. 2016. “How Much Scope for a Mobility Paradox? The Relationship between Social and Income Mobility in Sweden.” *Sociological Science* 3:39-60.

Breiger, Ronald L. 1981. “The Social Class Structure of Occupational Mobility.” *American Journal of Sociology* 87:578-611.

Cappelli, Peter. 1999. *The New Deal at Work: Managing the Market-Driven Workforce*. Cambridge, MA: Harvard Business Press.

Card, David, Jorg Heining, and Patrick Kline. 2013. “Workplace Heterogeneity and the Rise of West German Wage Inequality.” *Quarterly Journal of Economics*. 128:967-1015.

Carr, Michael D. and Emily E. Wiemers. 2107. “The Decline in Lifetime Earnings Mobility in the U.S.: Evidence from Survey-Linked Administrative Data.” Working Paper 2016-05, Washington Center for Equitable Growth, Washington, D.C.

Cheng, Siwei. 2014. “A Life Course Trajectory Framework for Understanding the Intracohort Pattern of Wage Inequality.” *American Journal of Sociology* 120:633-700.

Dencker, John C., and Chichun Fang. 2016. “Rent Seeking and the Transformation of Employment Relationships the Effect of Corporate Restructuring on Wage Patterns, Determinants, and Inequality.” *American Sociological Review* 81:467-487.

DiTomaso, Nancy. 2001. “The Loose Coupling of Jobs: The Subcontracting of Everyone?” Pp. 247-260 in *Sourcebook of Labor Markets* edited by Ivar Berg and Arne Kalleberg. New York: Kluwer Academic/Plenum Publishers.

Doumato, Eleanor A., and Marsha P. Posusney. 2003. *Women and Globalization in the Arab Middle East: Gender, Economy, and Society*. Boulder, CO: Lynne Rienner Publishers.

Economic Policy Institute. 2014. “Average Family Income Growth, by Income Group, 1947–2013.” http://www.stateofworkingamerica.org/charts/real-annual-family-income-growth-by-quintile-1947-79-and-1979-2010/. Retrieved on April 11, 2017.

Ermisch, John, Markus Jantti, and Timothy M. Smeeding. 2012. *From Parents to Children: The Intergenerational Transmission of Advantage*. New York: Russell Sage Foundation.

Erikson, Robert, and John H. Goldthorpe. 1992. *The Constant Flux: A Study of Class Mobility in Industrial Societies*. Oxford, UK: Clarendon Press.

Erikson, Robert, and John H. Goldthorpe. 2002. “Intergenerational Inequality: A Sociological Perspective.” *Journal of Economic Perspectives* 16:31-44.

Erikson, Robert, John H. Goldthorpe, and Lucienne Portocarero. 1979. “Intergenerational Class Mobility in Three Western European Societies: England, France and Sweden.” *British Journal of Sociology* 30:415-441.

Farley, Reynolds. 1996. *The New American Reality*. New York: Russell Sage Foundation.

Featherman, David L., and Robert M. Hauser. 1976. "Prestige or Socioeconomic Scales in the Study of Occupational Achievement?" *Sociological Methods & Research* 4:403-422.

Featherman, David L., and Robert M. Hauser. 1978. *Opportunity and Change*. New York: Academic Press.

Featherman, David L., F. Lancaster Jones, and Robert M. Hauser. 1975. "Assumptions of Social Mobility Research in the US: The Case of Occupational Status." *Social Science Research* 4:329-360.

Fisher, Jonathan D., and Christina A. Houseworth. 2013. "Occupation Inflation in the Current Population Survey." *Journal of Economic and Social Measurement* 38:243-261.

Genovese, Eugene D. 1965. *The Political Economy of Slavery*. Middleton, CT: Wesleyan University Press.

Gerber, Theodore P., and Sin Yi Cheung. 2008. "Horizontal Stratification in Postsecondary Education: Forms, Explanations, and Implications." *Annual Review of Sociology* 34:299-318.

Goldberger, Arthur S. 1989. "Economic and Mechanical Models of Intergenerational Transmission." *American Economic Review* 79:504-13.

Goldthorpe, John H. 2016. "Social Class Mobility in Modern Britain: Changing Structure, Constant Process." *Journal of the British Academy* 4:89-111.

Grodsky, Eric, and Devah Pager. 2001. "The Structure of Disadvantage: Individual and Occupational Determinants of the Black-White Wage Gap." *American Sociological Review* 66:542-567.

Grusky, David, Timothy M. Smeeding, and C. Matthew Snipp. 2015. “A New Infrastructure for Monitoring Social Mobility in the United States.” *The ANNALS of the American Academy of Political and Social Science* 657:63-82.

Grusky, David and Kim A. Weeden. 2006. “Does the Sociological Approach to Studying Social Mobility have a Future?” Pp. 85-108 in *Mobility and Inequality: Frontiers of Research from Sociology and Economics* edited by Stephen L. Morgan, David Grusky, and Gary Fields. Stanford: Stanford University Press.

Handwerker, Elizabeth W., and James R. Spletzer. 2016. “The Role of Establishments and the Concentration of Occupations in Wage Inequality.” *Research in Labor Economics* 43:167-193. Bingley, UK: Emerald Group Publishing Limited.

Hauser, Robert M. 1978. “A Structural Model of the Mobility Table.” *Social Forces* 56:919-953.

Hauser, Robert M. 1980. “Some Exploratory Methods for Modeling Mobility Tables and Other Cross-Classified Data.” *Sociological Methodology* 11:413-458.

Hauser, Robert M. 2010. “Intergenerational Mobility in the United States: Measures, Differentials and Trends.” Working Paper #98-12, Center for Demography and Ecology, University of Wisconsin. Madison, Wisconsin.

Hauser, Robert M., and David L. Featherman. 1977. *The Process of Stratification*. New York: Academic Press.

Hauser, Robert M., and John Robert Warren. 1997. “Socioeconomic Indexes for Occupations: A Review, Update, and Critique.” *Sociological Methodology* 27:177-298.

Heckman, James J. 2006. “Skill Formation and the Economics of Investing in Disadvantaged Children.” *Science* 312:1900-1902.

Heckman, James J., and Stefano Mosso. 2014. “The Economics of Human Development and Social Mobility.” *Annual Review of Economics* 6:689-733.

Hodge, Robert W. 1981. “The Measurement of Occupational Status.” *Social Science Research* 10:396-415.

Hodge, Robert W., Paul M. Siegel, and Peter H. Rossi. 1964. “Occupational Prestige in the United States, 1925-63.” *American Journal of Sociology* 70:286-302.

Hollister, Matissa. 2011. “Employment Stability in the U.S. Labor Market: Rhetoric versus Reality.” *Annual Review of Sociology* 37:305-324.

Hout, Michael. 1983. *Mobility Tables.* Beverly Hills, CA: Sage Publications.

Hout, Michael. 2015. “A Summary of What We Know Social Mobility.” *The ANNALS of the American Academy of Political and Social Science* 657:27-36.

Hout, Michael, and Thomas A. DiPrete. 2006. “What We Have Learned: RC28's Contributions to Knowledge About Social Stratification.” *Research in Social Stratification and Mobility* 24:1-20.

Iceland, John. 2006. *Poverty in America: A Handbook.* Berkeley: University of California Press.

Jacobs, David. 1981. “Toward a Theory of Mobility and Behavior in Organizations: An Inquiry into the Consequences of Some Relationships between Individual Performance and Organizational Success.” *American Journal of Sociology* 87:684-707.

Jacoby, Sanford M. 2001. “Risk and the Labor Market.” Pp. 31-60 in *Sourcebook of Labor Markets* edited by Ivar Berg and Arne Kalleberg. New York: Kluwer Academic/Plenum Publishers.

Jencks, Christopher, Lauri Perman, and Lee Rainwater. 1988. “What Is a Good Job? A New Measure of Labor Market Success.” *American Journal of Sociology*

93:1322-1357.

Juhn, Chinhui, Kevin M. Murphy, and Brooks Pierce. 1993. “Wage Inequality and the Rise in Returns to Skill.” *Journal of Political Economy* 101:410-442.

Kalleberg, Arne L. 2009. “Precarious Work, Insecure Workers: Employment Relations in Transition.” *American Sociological Review* 74:1-22.

Kalleberg, Arne L. 2011. *Good Jobs, Bad Jobs.* New York: Russell Sage Foundation.

Kambourov, Gueorgui, and Iourii Manovskii. 2008. “Rising Occupational and Industry Mobility in the United States: 1968–97.” *International Economic Review* 49:41-79.

Katz, Lawrence F., and David H. Autor, 1999. “Changes in the Wage Structure and Earnings Inequality.” in *Handbook of Labor Economics*, Vol. 3 edited by Orley Ashenfelter and David Card. Amsterdam: North-Holland and Elsevier.

Kilbourne, Barbara S., Paula England, George Farkas, Kurt Beron, and Dorothea Weir. 1994. “Returns to Skill, Compensating Differentials, and Gender Bias: Effects of Occupational Characteristics on the Wages of White Women and Men.” *American Journal of Sociology* 100:689-719.

Kim, ChangHwan and Arthur Sakamoto. 2008. “The Rise of Intra-Occupational Wage Inequality in the United States, 1983 to 2002.” *American Sociological Review* 73:129-157.

Kim, ChangHwan, Christopher R. Tamborini, and Arthur Sakamoto. 2015. “Field of Study in College and Lifetime Earnings in the United States.” *Sociology of Education* 88:320-339.

Kim, ChangHwan, Christopher R. Tamborini, and Arthur Sakamoto. 2018. “The Sources of Life Chances: Does Education, Class Category, Occupation, or Short-Term Earnings Predict 20-Year Long-Term Earnings?” *Sociological Science* 5:

206-233.

Kitano, Harry H. 1976. *Japanese Americans*. Upper Saddle River, NJ: Prentice Hall.

Krugman, Paul. 2011. “Notes on Class Warfare.” September 20. *New York Times*.

Krugman, Paul. 2012. “The Great Gatsby Curve.” January 15. *New York Times*.

Krugman, Paul. 2014. “Liberty, Equality and Efficiency.” March 10. *New York Times*.

Lane, Julia. 2009. “Inequality and the Labor Market: Employers.” Pp. 204-229 in *Oxford Handbook of Economic Inequality* edited by Wiemer Salverda, Brian Noland, and Timothy M. Smeeding. Oxford, UK: Oxford University Press.

Levy, Frank. 1998. *The New Dollars and Dreams: American Incomes and Economic Change*. New York: Russell Sage Foundation.

Levy, Frank, and Peter Temin. 2009. “Inequality and Institutions and Wages in Post-World War II America.” Pp. 15-50 in *Labor in the Era of Globalization* edited by Clair Brown, Barry J. Eichengreen, and Michael Reich. Cambridge, UK: Cambridge University Press.

Liu, Jeng, Arthur Sakamoto, and Kuo-Hsien Su. 2010. “Exploitation in Contemporary Capitalism: An Empirical Analysis of the Case of Taiwan.” *Sociological Focus* 43:259-81.

Mazumder, Bhashkar. 2014. “Black–White Differences in Intergenerational Economic Mobility in the U.S.” *Economic Perspectives* QI:1-18. Federal Reserve Bank of Chicago, Chicago, IL.

Mitnik, Pablo, Victoria Bryant, Michael Weber, and David B. Grusky. 2015. “New Estimates of Intergenerational Mobility using Administrative Data.” Statistics of Income Division Working Paper, Internal Revenue Service. (https://www. irs. gov/pub/irssoi/15rpintergenmobility. pdf). Retrieved on September 17, 2016.

Mouw, Ted and Arne L. Kalleberg. 2010. “Occupations and the Structure of Wage Inequality in the United States, 1980s to 2000s.” *American Sociological Review* 75:402-431.

Murphy, Emily and Daniel Oesch. 2016. “The Feminization of Occupations and Change in Wages: A Panel Analysis of Britain, Germany, and Switzerland.” *Social Forces* 94:1221-1255.

Pindyck, Robert S. and Daniel L. Rubinfeld. 2003. *Microeconomics,* 5th ed. Upper Saddle River, NJ: Prentice Hall.

Reardon, Sean F. 2011. “The Widening Academic Achievement Gap between the Rich and the Poor: New Evidence and Possible Explanations.” Pp. 91-116 in *Whither Opportunity* edited by Greg J. Duncan and Richard J. Murnane. New York: Russell Sage Foundation.

Redbird, Beth. 2017. “The New Closed Shop? The Economic and Structural Effects of Occupational Licensure.” *American Sociological Review* 82:600-624.

Sakamoto, Arthur, and Satomi Furuichi. 1997. “Wages among White and Japanese-American Male Workers.” *Research in Social Stratification and Mobility* 15:177-206.

Sakamoto, Arthur, and ChangHwan Kim. 2010. “Is Rising Earnings Inequality Associated with Increased Exploitation? Evidence for U.S. Manufacturing Industries, 1971–1996.” *Sociological Perspectives* 53:19-43.

Sakamoto, Arthur, and ChangHwan Kim. 2012. “Demographic Trends in Educational Opportunity Using a Market-Based Measure.” Paper presented at Income, Inequality, and Educational Success conference at the Stanford Center for Policy Analysis, Stanford, CA.

Sakamoto, Arthur, Jeng Liu and Jessie M. Tzeng. 1998. “The Declining Significance of

Race among Chinese and Japanese American Men." *Research in Social Stratification and Mobility* 16:225-246.

Sakamoto, Arthur, Jason Rarick, Hyeyoung Woo, and Sharron X. Wang. 2014. "What Underlies the Great Gatsby Curve? Psychological Micro-Foundations of the 'Vicious Circle' of Poverty." *Mind & Society* 13:195-211.

Sakamoto, Arthur, Christopher R. Tamborini and ChangHwan Kim. 2018. "Long-Term Earnings Differentials Between African American and White Men by Educational Level." *Population Research and Policy Review* 37: 91-116.

Sakamoto, Arthur, and Sharron X. Wang. 2017. "Occupational and Organizational Effects on Wages among College-Educated Workers in 2003 and 2010." *Social Currents* 4:175-195.

Sewell, William H., Robert M. Hauser, and Wendy C. Wolf. 1980. "Sex, Schooling, and Occupational Status." *American Journal of Sociology* 86:551-583.

Shils, Edward. 1968. "Deference." Pp. 104-132 in *Social Stratification* edited by John A. Jackson. Cambridge, UK: Cambridge University Press.

Smith, Christopher L. 2011. "Polarization, Immigration, Education: What's Behind the Dramatic Decline in Youth Employment?" Federal Reserve Board Finance and Economics Discussion Series, Washington, D.C.

Sobel, Michael E. 1983. "Structural Mobility, Circulation Mobility and the Analysis of Occupational Mobility: A Conceptual Mismatch." *American Sociological Review* 48:721-727.

Stiglitz, Joseph E. 2015. "Inequality in America: A Policy Agenda for a Stronger Future." *The ANNALS of the American Academy of Political and Social Science* 657:8-20.

Tach, Laura M. 2015. "Social Mobility in an Era of Family Instability and

Complexity." *The ANNALS of the American Academy of Political and Social Science* 657:83-96.

Thomas, Dorothy S., Charles Kikuchi, and James M. Sakoda. 1952. *The Salvage: Japanese American Evacuation and Resettlement*. Berkeley: University of California Press.

Tomaskovic-Devey, Donald. 2014. "The Relational Generation of Workplace Inequalities." *Social Currents* 1:51-73.

Tomaskovic-Devey, Donald, and Ken-Hou Lin. 2011. "Income Dynamics, Economic Rents, and the Financialization of the US Economy." *American Sociological Review* 76:538-559.

Torche, Florencia. 2005. "Unequal but Fluid: Social Mobility in Chile in Comparative Perspective." *American Sociological Review* 70:422-450.

Torche, Florencia. 2011. "Is a College Degree Still the Great Equalizer? Intergenerational Mobility across Levels of Schooling in the United States." *American Journal of Sociology* 117:763-807.

Torche, Florencia. 2015. "Analyses of Intergenerational Mobility: An Interdisciplinary Review." *The ANNALS of the American Academy of Political and Social Science* 657:37-62.

Torche, Florencia. 2015b. "Intergenerational Mobility and Equality of Opportunity." *European Journal of Sociology* 56:343-371.

Treiman, Donald J. 1977. *Occupational Prestige in Comparative Perspective.* New York: Academic Press.

Tumin, Melvin M. 1953. "Some Principles of Stratification: A Critical Analysis." *American Sociological Review* 18:387-394.

Weeden, Kim A., and David B. Grusky. 2005. "The Case for a New Class

Map." *American Journal of Sociology* 111:141-212.

Weeden, Kim A., Young-Mi Kim, Matthew Di Carlo, and David B. Grusky. 2007. "Social Class and Earnings Inequality." *American Behavioral Scientist* 50:702-736.

Western, Bruce, and Becky Pettit. 2010. "Incarceration and Social Inequality." *Daedalus* 139:8-19.

Western, Mark, and Erik Olin Wright. 1994. "The Permeability of Class Boundaries to Intergenerational Mobility among Men in the United States, Canada, Norway and Sweden." *American Sociological Review* 59:606-629.

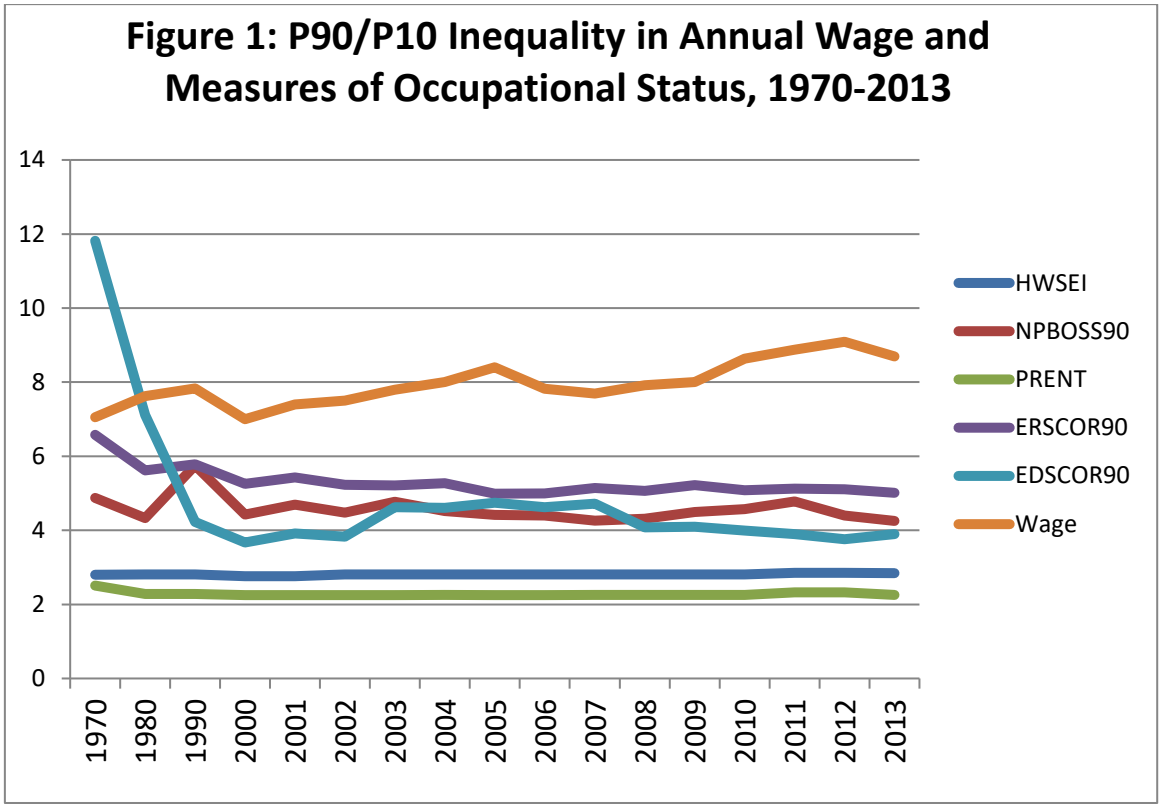
Whitehead, Alfred N. 1916. "The Organization of Thought." *Science* 22: 409-419.

Wilkinson, Richard G. and Kate E. Pickett. 2009. "Income Inequality and Social Dysfunction." *Annual Review of Sociology* 35:493-511.

Wilson, William J. 1978. *The Declining Significance of Race*. Chicago: University of Chicago Press.

Xie, Yu. 1999. "The Tension between Generality and Accuracy." *Sociological Methods and Research* 27:428-435.

Zimmerman, David J. 1992. "Regression Toward Mediocrity in Economic Stature." *American Economic Review* 82:409-29.



Notes: HWSEI refers to Socioeconomic Index by Hauser and Warren. NPBOSS90 refers to Nam-Powers-Boyd Occupational Status Score. PRENT refers to Occupational Prestige Score by Nakao and Treas. ERSCOR90 refers to Occupational Earnings Score. EDSCOR90 refers to Occupational Educational Score. Wage refers to annual earnings divided by annual hours worked.