Is Occupational Mobility Declining in the U.S.?
Author(s): Steven Rytina
Source: *Social Forces*, Vol. 78, No. 4 (Jun., 2000), pp. 1227-1276
Published by: Oxford University Press
Stable URL: https://www.jstor.org/stable/3006174

Is Occupational Mobility Declining in the U.S.?*

STEVEN RYTINA, *McGill University*

Abstract

Occupational mobility trend is compared using SSIC versus Prestige and SEI scales. A preliminary survey of what occupational scales measure leads to a contrast between older, normative scales and a norm-independent conception of occupational dominance. Dominance may be assessed by three convergent algorithms that assess relative rank by taking averages over origins and destinations. These are shown, to a good approximation, to be averages over advantage, no matter how advantage is indexed. Data from the OCGII and subsequent NORC General Social Survey are analyzed. The dominance results replicate as consistent contrasts with SEI. Trend is summarized as nondecreasing and quite possibly increasing intergenerational rigidity. Tentative evidence of a big shake-up after 1986 is presented. The declining role of education in access to rank and as mediator of ascription is described.

Opportunity for mobility has long been advanced as a positive and distinguishing feature of U.S. society. Mobility implies that the hurts of inequality are potentially fleeting. Since it is generally accepted across the political spectrum that rewards to the accidents of birth are unjust, apologists and critics divide over the degree to which the best outcomes accrue to individual effort or merit.

U.S. research into occupational mobility has produced a twofold answer. Pervasive concern about widely anticipated increases in rigidity after World War II faded in the face of empirical research (see Duncan 1968 for a review sustaining "no trend" as the most reasonable summary). The culmination of that research tradition, status attainment, produced a remarkable reversal of the dominant expectation about change.

* *The author would like to gratefully acknowledge financial assistance from the Social Sciences and Humanities Research Council of Canada, Grant 410-95-0712.* *Direct correspondence to Steven Rytina, Department of Sociology, McGill University, 855 Sherbrooke St. W., Montreal, Quebec, H3A 2T7, Canada. E-mail: SRYTIN@PO-Box.McGill.Ca.*

 Social Forces, June 2000, 78(3): 1227-1276

Blau and Duncan (1967) concluded that the U.S. was increasingly approximating the type of society that "perpetuates a structure of differentiated positions but not their inheritance" (1967: 441). Later research has seemed to confirm the anticipation that fluidity would increase and ascription decline. The intergenerational correlation fell (from .405 to .369) in Featherman and Hauser's (1978) replication, while education's mediating role rose. The continuation of the trend is apparent in the subsequent NORC General Social Surveys, where the intergenerational correlation for males is .34 (1972-90 cumulative data). Recent analyses, such as DiPrete and Grusky (1990) and Hout (1988), provided detailed empirical elaboration of the themes of increasing fluidity and declining ascription.

Theoretical anticipation of this appears as early as Parsons (1940), and was perhaps most clearly summarized in Treiman's (1970) account of what Erikson and Goldthorpe (1992) gloss as the "logic of industrialization." According to this thesis, the increasing efficiency of production in large organizations shifts decisions governing occupational outcomes to bureaucracies. Universalistic criteria like education gain force, the ability of kin networks to perpetuate rank fades, and intergenerational mobility rises.

But Erikson and Goldthorpe (1992) ultimately cast doubt on the thesis by applying the most closely comparable coding of mobility data for international comparison yet assembled. They report no evidence of any tendency to increasing fluidity across many levels of economic development. This raises the question of whether recent U.S. experience is genuinely exceptional or has only appeared to be so.

In this article, I will present evidence that the recent trend in occupational stratification for the U.S. indicates nondecreasing or even increasing rigidity. A counterpart is a decline in the importance of education, both as the key to high rank and as the mediator of rank persistence.

This rather dramatic contrast in findings arises from a different approach to assessing mobility. Much research has assumed that occupations lie along a continuum or hierarchy. But empirical specifications of that hierarchy have had to rest, directly or indirectly, on popular evaluations, aggregated to capture (or reflect) collective agreement or normative sentiments. It shall be argued below that this can be omitted in favor of direct assessment of occupational dominance in competition for advantage. This interpretation of mobility as reflecting relative *power* and not necessarily standing in a normatively sanctioned hierarchy can be implemented via a trio of convergent methods including Rytina's (1992a) symmetric scaling of intergenerational continuity (SSIC).

Critique that may be divided into two lines have been directed against such an interpretation. First, Hauser and Logan (1992) charged that the SSIC produced higher intergenerational correlations (than the Socio-Economic Index) because SSIC capitalized on sampling errors. Their core claim was that SSIC would inevitably fail to reproduce comparably high correlations when applied to subsequent data. Were this true, carrying SSIC forward to assess trend would necessarily reveal an artifactual increase in fluidity. But, ironically, it is SSIC that provides the tool to demonstrate precisely the opposite: the nondecreasing (or even increasing) trend in rigidity that standard methods do not reveal. Thus, these concerns require limited special attention since the main line of evidence refutes them.

The second line of critique is probably of more general interest. As an occupational scale, SSIC values stand in for alternatives like the Socio-Economic Index (SEI) in correlations summarizing intergenerational mobility. Yet SSIC is plainly not conceptually equivalent to SEI, raising the issue of what the alternative means or what it measures. Therefore, the first step toward an alternative account of mobility volume is a conceptual comparison of alternative measurement strategies.

Conceptual Interpretations of Occupational Scales and the Measurement of Mobility

Any empirical approach to occupational mobility must somehow tame or manage the disorderly complexity of the raw material. The nitty-gritty details are codes of 300+ Census Detailed Occupational Categories (DOCs). Duncan pioneered the two extant compromises with complexity: impose a (much) smaller number of aggregated categories (such as the 17-fold scheme made popular by Blau and Duncan 1967) or impose some hierarchical scale, such as Prestige scores or the SEI. Although the methods and conceptualization that I will here propose provide a unified way to transcend the division between tabular and scale-based methods, I will here focus on scales.

Do such scales measure something? I suspect many would agree that Prestige or SEI (or both) measure the stratification of occupations. Some such premise is implicit in the roles such scales have played as anchors for analysis of the process of stratification.

Such a notion hides several ellipses that are sometimes noted but remain unresolved. First, how can there be more than one different *measure* of the same thing? In loose, albeit common, usage any series of numbers is called a measure. But to be precise, one must allow that these are only indices, as of course is implied in the term Socio-Economic *Index*. And many different indices or whole families of indicators could be readily conceived. Second, is there then any candidate for an underlying true construct? And within this lurks a very real practical issue: what is one to make of the particular choices in wide use?

It is rarely noted that Duncan (1984) himself was highly critical of any claim that SEI, and the like, were measures. Measurement along a continuum arguably must satisfy at least two criteria. First, the equivalence classes implicit in equal numerical value for different objects must be meaningful. The second arises from the difficult notion of isomorphy between empirical and theoretical relations (Suppes & Zinnes 1963). A more accessible variant is what I call "the fine-print test."[1] By this criterion, any numerical difference, no matter how small, should be manifest in a proportional effect. Numerical contrast must have meaning "down to the fine print." Thus, pointer deflection on a lab balance *measures* mass because the tiniest differences correspond to (are isomorphic with) resistance to acceleration as specified by the law of inertia, force = mass * acceleration.

There is no sociological equivalent (to put it mildly) to the law of inertia. Yet something roughly analogous can be adduced as a central "deep concept" in mobility research. At the core of the standard perspective are sentences in causal rhetoric, for example, that father's occupation is a cause of offspring's occupation. But rhetorical license is presumably involved. While "cause" is invoked as a presupposition to motivate certain statistical operations, it seems likely that few (if any) intend this literally, that is, are asserting that father's occupation is a material or exacting cause that results in precisely commensurate effects, just like mass deflecting a balance needle. But an analogy with inertia glimmers through.

Father's occupation is a summary "cause," if not a literal one, insofar as there is an *inertia* or resistance to change. The apple tends to land close to the tree. Allowing for regression to the mean, the most likely outcomes are those most similar to father's occupation, and this applies globally to occupations as a system of contrasts. Thus a goal would be to uncover whatever best realizes the underlying principle of inertia or resistance to displacement.

A complementary notion is of "paths of least resistance." As noted, it makes little sense to regard occupation as a material cause. Yet were one to examine, say, a collection of sons of Lawyers,[2] a path of least resistance would be apparent in their average outcome, a middling white-collar occupation like, say, Accountant. (The example is empirical, based on the General Social Survey data discussed below.) Said path of least resistance is, of course, a statistical construct, and only 1 of the 45 Lawyer's sons in the sample actually became an Accountant. Nearly all stray off from the exact path of least resistance, some to their advantage, others to their disadvantage, but the central path is down a valley hemmed in by hills of increasing improbability. Overall, the collective life-chances of Lawyers' sons are set apart from other occupations because nearly all other origins open into less advantageous paths of least resistance.

Bourdieu (1984) expressed his reproductionist outlook in comparable terms:

> Individuals do not move about social space in a random way, partly because they are subject to the forces which structure this space (e.g. through the objective mechanisms of elimination and channeling) and partly because they resist the forces of the field with their specific inertia, that is, their properties, which may exist in embodied form, as dispositions, or in objectified form, in goods, qualifications etc. To a given volume of inherited capital there corresponds a band

> of more or less equally probable trajectories leading to more or less equivalent positions. (110)

Although Bourdieu does not directly speak of occupations, his "cultural capital" includes the sorts of skills, learned dispositions, and qualifications that U.S. writers associate with occupational incumbency. However, in place of his metaphorical "more or less equally probable," the model advanced below describes precise central tendency surrounded by probabilities that smoothly diminish as one strays further off the beaten path.

Notions like inertia and the complementary paths of least resistance have clear echoes in core research interests of the U.S. mainstream as well. In a famous discussion of how to define and measure stratification and change, Duncan (1968) called attention to a conceptual confusion that still persists. Many authors use *inequality* and *stratification* as synonyms. But the former is a cross-sectional concept. The latter refers to layers that endure over time:

> Social *stratification* refers to the persistence of positions in a hierarchy of inequality, either over the life time of a birth cohort of individuals or, more particularly, between generations. The definition implies that a stratified population is one in which there is intertemporal predictability (to a greater than chance extent) of an individual's status at one time, given his status (or that of his family of orientation) at some earlier time. Thus a society is stratified with respect to wealth if a wealthy family's offspring are discernibly more likely to be wealthy than are the offspring of a poor family. The rigidity of stratification, in this sense, is measured by the intergenerational correlation. (681)

Duncan defined stratification as a statistical concept or matter of degree. Layers or strata exist insofar as comparison of at least two points in time reveals predictability. Stratification is thus defined as the exact logical counterpart of mobility, which is change over time or unpredictability. Duncan's concept is identical to inertia: stratification is the degree to which rank is conserved over time. However, it is clear from the quoted passage that Duncan allowed that there would have to be distinct correlations for different axes of inequality, such as wealth. There is no indication that he thought that occupations, as such, had predictability or inertia.

Duncan's usage is, of course, not universal. In many contexts, *stratification* is a broader term, with a referent as wide as "all socially structured inequalities." Such usage is not radically at odds with Duncan's; the qualifier *structured* generally entails persistence over time. But let me here reserve *D-stratification* to refer to Duncan's more exacting concept of "persistence over time within families or lineages" with a corollary reference to formation of layers or *strata*.

Arguably, Duncan's project would entail grouping occupations into strata only if they exhibit parallel patterns of change over time, in particular, in intergenerational transitions. But a key ellipsis is apparent in the quoted passage. In effect, Duncan substitutes *assorted inequalities* in place of *occupation,* as such.

Occupation is a scheme of mutually exclusive categories, or what Blau (1977) called a nominal parameter. There is no immediate or straightforward sense that can be made of "correlation" between occupations over time. Instead, one must shift to a cognate feature, that assorted and various dimensions of inequality, such as wealth or power or earnings, tend to be consolidated with occupation.

This leads directly to an embarrassment of riches. No one dimension of inequality yields D-stratification of occupation, pure and simple, and one can speak only of the assorted and various degrees of D-stratification of occupational-earnings, occupational-wealth, or occupational-what-have-you. While Duncan's project seems to call for an inertia of occupation, as such, extant practice stops short. What is nowhere on offer is anything like a measure in the strong sense that would single out a conceptually coherent hierarchy of occupation.

This lacuna has not escaped comment. Scott (1996) and Crompton (1993) record what is by now the common view: that the study of occupational mobility along any kind of continuum requires a preempirical assumption that occupations form some sort of normatively sanctioned hierarchy. There is an important grain of truth, insofar as prestige is operationalized by assessing popular ideals, and SEI has unavoidable normative overtones because it is scaled to mimic measured prestige as a criterion. It appears that the embarrassment of riches can be resolved only by some kind of appeal, acknowledged or not, to arguments stemming from the functional theory of stratification.

Proponents have not always welcomed such attribution of theoretical intent and much in the historical record supports their position. The notion that assorted indicators may be summed to produce an overall index of socioeconomic status (the now rarely seen SES) goes back at least to Warner (1949) and his Index of Status Characteristics. Warner helped popularize taking sums across diverse indicators to synthesize a unidimensional hierarchy, which evolved into the problem of occupational scaling.[3] (The continuity is reflected in reports like Duncan and Artis 1951.) Much of this literature was guided by pragmatic concerns and not any overt commitment to the functional theory. In its later guises, this agenda has sometimes been identified with Weber as an authority for the multidimensional character of stratification.

Hodge (1981) singled out prestige as having a clear conceptual basis in Weber's concern for status honor. He regarded the conceptual content of the SEI as far less clear. Historically, it was a pragmatically motivated substitute for missing values on prestige. Hauser and Warren (1997) echo Hodge in stating "nor is there a strong theoretical basis for a concept of occupational socio-economic status" (178), yet they claim to address "the limits as well as the heuristic value of measures of socioeconomic status" (179). But this is somewhat unsatisfying, for to claim to *measure* without a *concept* comes rather close to the naked operationalism that "socioeconomic is what the Socio-Economic Index measures."

This heuristically valuable tool thus admits of many conceptual readings, and *no standard one*, because it came about by pragmatic evolution from the older SES. In the earlier literature, it is often implicit or taken for granted that a unitary dimension was unproblematic or "out there to be tapped." But as statistical and conceptual sophistication grew, it became ever more widely understood that inequalities over occupation, and inequalities more generally, were multidimensional. Favoring, finding, or focusing on any single dimension derived from such inequalities is an act of construction, ideally one motivated by clear conceptual concerns. For purposes of comparison and contrast, I will here offer one.[4]

The SEI singles out two of the many dimensions, occupational earnings and education. The two are resolved into one by carrying out a regression with Prestige scores as a criterion. This yields roughly equal, or 50:50, weights. To supply a concept, one must lay out what the favored dimensions share in common and why they deserve singling out. One path is to note that money, or more narrowly earnings, is a normatively sanctioned reward, especially in a market society. (A Weberian flavor could be added by reference to returns to application to one's calling.) A few crank socialists (and sociologists) aside, the dominant popular sentiments, or even consensus, are reflected in such adages as "you earned it, it's yours." The very term *earn* connotes just desert. Hence market returns to an occupation both reflect socially sanctioned merit, a species of entitlement, and enable the pursuit of happiness, allowing individuals to attain various ends as they see fit.

The SEI invokes equivalence classes, that is, the roughly equal weights in the formula mean that ranks are assigned by tradeoffs, more education counterbalancing lesser earnings and vice versa.[5] One must therefore accord to education a role that is parallel to that of earnings. This is straightforward. Education is no less a fount of normatively sanctioned merit. In many settings, education, or the performances and symbols to which it ensures differential access, can be applied as a highly generalized means to attain one's ends.

A final element is that SEI refers to occupation, not to individual earnings or education. Accordingly, on the present interpretation, the concept behind SEI can be glossed as the "typical endowment of two, central, normatively sanctioned resources implicit in occupational incumbency," or in a shorthand label: Normative Resources. On this account, the SEI differs from prestige in reflecting a somewhat harder-nosed notion of hierarchy based on two highly general resources that supply means to attain the individual's ends. But the question then apparent is: why include just these two and nothing else?

In practice, of course, there are compelling grounds, like expense and convenience. But a limitation of SEI is that there is no obvious conceptual grounds for restricting attention to just the two indicators. Two paths are apparent for extension, one more "ideal" or norm-oriented and the other harder and more conflictual. If, contrary to my reconstruction of conceptual intent, one's aim was to capture status, e.g. along the lines of Warner, to reflect some overall standing and commensurate respect in the community, why not incorporate other possibilities, such as Warner's dwelling type, and so forth?

The opposite emphasis, which I shall pursue, is conflictual. Earnings and education by no means exhaust the list of very general resources , or assets toward winning one's way, that come bound up with occupation. Others include cultural capacity, control over organizational or other social resources, and networks producing influence or "pull." Any of these are not just individual possibilities, but like Normative Resources, can be seen as structurally characteristic of occupations. These are less normatively celebrated, or even deplored, but they surely work.

It is a long list, but SEI is undeniably incomplete. In an infelicitous but accurate phrase, it is an "Educ-Economic indicator," and there is no justification for the all-encompassing "Socio." Educ-Economic resources is a useful summary, and this highly convenient first approximation has served the field very well. However, the limitation to two, albeit leading, normatively sanctioned resources ensures that it does not exhaust the causal power of occupational incumbency.

A more comprehensive notion of the overall or *social* capacity of an occupation is implicit in the path of least resistance that an occupation collectively carves out for its children. Certainly, incumbents would draw upon normatively sanctioned resources, but they *could* also do otherwise where possible, and no doubt some do. The extent to which they are able to supply their children with resistance to change (or from the standpoint of the bottom, are unable to supply them with the means to overcome that which is supplied to competitors) is the inertia that follows from occupation. But inertia is neutral, with some trapped into disadvantage, others "trapped" (or steered, or channeled) into advantage. The hierarchical counterpart, of the ability to ensure differential access to advantage, is *domination*, the relative ability to secure a better portion of what is desirable to all.

In parallel with the contrast inequality/stratification, the temporal aspect requires emphasis. Domination is often used with interpersonal overtones, and the narrow, immediate imagery this calls to mind is akin to the fleeting moment of the cross section. But here the emphasis is on resources, traits, or network positions as a persistent, enduring locus of gaining one's ends, even as circumstances alter, or even as one generation succeeds another. The referent is not the peaks and valleys of individual, interpersonal power, but the collective (or average) circumstances, persisting even over lengthy careers, that set occupations apart.

Bourdieu (1984) has emphasized that that which makes social positions more (and less) dominant in this broadest sense seeps over to those who participate in primary groups with more (and less) dominant persons. Cultural patterns, to say nothing of money or property, access to influence, and so forth are systematically more (and less) available as a function of parental position in the division of labor. Persistence and duration are central emphases, for long exposure is required to shape individuals into differentiated, innate, response tendencies (*habitus*).

On this view, relative success in carving more (and less) attractive paths of least resistance for children reflects the *power*, and not just the normative standing, of an occupation. It is, of course, a somewhat indirect measure of the very broad concept of power, but hardly a trivial one. Lenski (1966 [1984]) identified primary group adhesion, most powerfully to family, as a universal human trait that was central to understanding stratification. This formulation is complementary to Duncan's. Occupations of greater power can form (advantaged) strata enduring in time only if they (collectively) divert some of that power away from sheer self-satisfaction and use it to clear the way for offspring. (For that matter, kin, even dependent kin, often have leverage to divert others' power to their selfish advantage.) Occupations of lesser power form disadvantaged strata by virtue of their inability to do otherwise.

Thus, the a priori adoption of a scale that depends on norms is not intrinsic to Duncan's project, even though it has been the widespread practice. Similarly, occupations, as a concept, are not intrinsically locations in a normative hierarchy. Occupations, as such, are slices of divided labor, or labor-market segments, and co-membership in an occupation is exposure to a particular labor market.

Grusky and Sørensen (1998) have recently argued that occupations are the true loci of many properties more traditionally attributed to social classes. Collectively, the aggregates marked off by detailed occupations jockey for various outcomes, some via organization and collective action, others less positively favored as the subjects of more powerful actors and organizations that employ (and discharge) individuals (Granovetter & Tilly 1989). Such social struggles produce all sorts of outcomes, relative advantages and disadvantages, that often persist but sometimes shift. But one consequence, which not only links occupations over a common denominator and involves a broad definition of "social," is that (nearly) all occupations produce, via their incumbents, children. Said children compete for access to market segments, for occupations. Replacing a normative conception of occupational hierarchy with one based on competition over outcomes helps advance Grusky and Sørensen's (1998) proposal that disaggregated, detailed occupations can be usefully viewed through the prism of class. And offsprings' overall or average success is arguably a central realization of the social capacity, in a broad sense, of occupations.

Thus, following Duncan, one could insist that an occupation is in a higher or lower stratum exactly and precisely to the degree that the occupation recruits from higher or lower positions and propels offspring commensurately. Or, complementarily, one could interpret the relative capacity to clear a path of least resistance to advantage as a manifestation of the relative social capacity, or power, of the occupation, no matter how that is exercised, i.e., independent of popular normative sentiments. As shall be seen, the same occupations that best propel children also, in parallel, attract the pools of recruits that are richest in original assets. (One could regard such a pattern as a testable prediction derived from a reproductionist outlook such as that of Bourdieu.) This suggests that the inferred power to advance children is accompanied, happily enough, by advantages sufficient to attract those motivated by potential satisfactions for self.

Such a notion of hierarchy, were it implemented, would lend itself to a variety of plausible interpretations, and thus prove a handy addition to the tool kit, useful for at least some objectives. One that stands out is measuring mobility. What has been assessed heretofore is the degree to which Normative Resources, or consensual honor, or other inequalities over occupation reveal persistence. What could be achieved is operationalizing the degree to which occupations are, in the sense of the program outlined by Duncan, *stratified.*

What is less apparent is how such verbal anticipation can be translated into operational procedures that avoid critical pitfalls. The collective outcome for all offspring is most readily summarized by an average, but an average of what? Available occupational ranking schemes might be a possibility, but would that not lead to many different indices, one for each such scheme? How could one evade the embarrassment of riches? And would these not still depend upon, and therefore incorporate, the normative component that has been implicit in every attempt to nail down a specific occupational continuum? And why would this yield a scale, much less one that satisfied D-stratification, or the fine-print test?

Answers to such questions must await a survey of the methodologies that implement the dominance scale. And before these may be examined, the data must be defined.

Data

Data derived from the 1972 Occupational Changes in a Generation II (DPLS 1983) provides a baseline for comparison. The NORC General Social Survey (Davis 1990) with samples from 1972 to 1990 (excepting 1979 and 1981, when no surveys were carried out) provides information to assess trend.

To maintain comparability with earlier analyses (Rytina, 1992a, 1992b), essentially the same sample restrictions were imposed. Analysis was limited to respondents in the experienced civilian labor force, aged 25 to 64, inclusive, and cases with data on father's occupation, current occupation, and education. To enhance comparability with OCGII, only male respondents from the GSS were included.

In my earlier analysis of the GSS data, a restriction to the 315 occupations with at least one father and at least one offspring was imposed, and seven infrequent occupations were eliminated as outliers impeding convergence. One further occupational line (current members of the armed forces) was eliminated because it was not included in the OCGII. With only males eligible for inclusion, three more sparse outlying occupations had to be dropped, leaving 304. For the GSS, 6,061 or 94.16% of the cases having complete data remained after exclusions. For OCGII, 17,118.2 or 94.13% of weighted cases remained.

Methods

Three logically or formally independent procedures give flesh and specificity to the notion of a dominance ordering. One is an appeal to averaging, called Iterated Averaging, and its role is to aid intuitive clarification and to provide access to some key properties. Another, called Model II* by Goodman (1979), amounts to fitting relative locations within what Goodman (1981) called a *generalized* form of the normal (Gaussian) distribution, via an algorithm based on Maximum Likelihood.[6] A third is Rytina's (1992a) Symmetric Scaling of Intergenerational Continuity (SSIC), which maximizes the intergenerational correlation, subject to a constraint of symmetry, that is, parallel location for origins and destinations. All but the first are defined in the cited sources.

What gives these unity is empirical convergence, as displayed in Table 1.[7] The correlations among the three alternative dominance rankings are in the high nineties.[8] This means that, excepting remarks based on rigorous and exacting mathematical distinctions, the three dominance rankings are interchangeable. Any property of one applies to each of the others, to a close approximation. Accordingly, I shall freely draw upon whichever is convenient in display of basic properties.

A preliminary issue is asymmetry of location between father and offspring for any occupation. To assess this, for each occupation for which both fathers and offspring were reported, I fitted a variant where all occupations but one were fitted symmetrically (as in Model II*) but the "test" occupation was fitted without the symmetry constraint (as in Goodman's Model II).[9] For the GSS, the sum of the resulting 290 1 df G^2 was 285.1. (Strictly speaking, these statistics are not quite independent, but the attained level of significance for the sum is Pr = .570.) For the OCGII, the sum of the resulting 288 1 df G^2 was 329.2 (Pr = .0475). This is statistically significant, but hardly impressive given the very large sample involved. Furthermore, for both samples, the distribution of these test statistics graphically mimics theoretical χ^2 distribution very closely (e.g., for OCGII, one would expect .05 * 288 = 14.4 of the statistics to exceed the 5% cutoff value of 3.84 , and one finds that exactly 14 empirically exceed that value). The graphs show that similar close conformity to theoretical expectations holds for parallel statements at all probability values. Since the number of "significant" G^2s is, for any level of significance, that which would be expected by chance, there exists almost no basis for singling out any occupation as asymmetric.[10]

TABLE 1: Correlations among Assorted Operationalizations of Occupational Rank

	SSIC	M2*	LimItAvg	SEI	Prestige
SSIC	—	.999	.982	.763	.591
M2*	.996	—	.977	.754	.579
LimItAvg	.985	.969	—	.790	.640
SEI	.849	.814	.872	—	.867
Prestige	.669	.632	.708	.861	—

Note. Statistics based on 304 occupations as unit of analysis weighted to reflect sample frequencies. Upper right entries based on the NORC GSS, 1972-90, N = 6,061, lower left entries based on OCGII, N = 17,118. SSIC are values from Symmetric Scaling of Intergenerational Continuity. M2* are scale values estimated as locations within the symmetric, generalized, binormal surface defined by Goodman's (1979) Model 2*. LimItAvg is the limit of the Iterated Averaging described in the text. SEI scores are MSEI2 from Stevens and Featherman (1981). Prestige scores are those distributed with GSS and derive from Siegel (1971).

Occupations that empirically granted favorable opportunities to descendants were in equal measure those whose current incumbents were from origins with such favorable opportunities. Thus high (or low) dominance rank does not only mean that offspring may anticipate success (or failure), but that incumbents were recruited from advantaged (or disadvantaged) circumstance, and thus the occupation proved attractive to (or the sad fate of) those with bountiful (or restricted) options. This justifies the interpretation that higher dominance rank is "better" in the perceptions of those most immediately concerned.

The conceptual motivation for labeling the scaled hierarchy as one of dominance, as well as the comparative terms (advantage, disadvantage, "better") of the last paragraph rested on the notion of summarizing destinations along with, by symmetry, origins by taking averages. Perhaps the most counterintuitive feature concerns the question: in assessing relative dominance, what is averaged? The answer, within an approximation, is *whatever measure of occupational inequality one might care to consider.* Put the other way around, greater dominance rank entails enhanced intergenerational access to advantages attendant on occupation, *no matter what kind of advantage is at issue.* This property sustains the interpretation of the hierarchy as one of dominance: origins in superior (inferior) occupations enhance access to superior (inferior) outcomes in general. By symmetry, dominant occupations are differentially staffed by persons from families of greater advantage.

To see this, one needs go down to details. Mobility data associates any occupation with a *mobility counterpart*: the set of detailed occupations reported as origins by some occupation's incumbents or as destinations for sons reporting fathers who held the occupation. Any concrete mobility counterpart from a sample comes down to a list (with occasional repeated entries) of nominal occupational categories. Each occupation's mobility counterpart is a subset of all possible occupations and, quite generally, the subsets differ, among different occupations and from the overall population distribution. But there is no direct way to summarize (or compare) such frequency distributions over a nominal classification like detailed occupations.

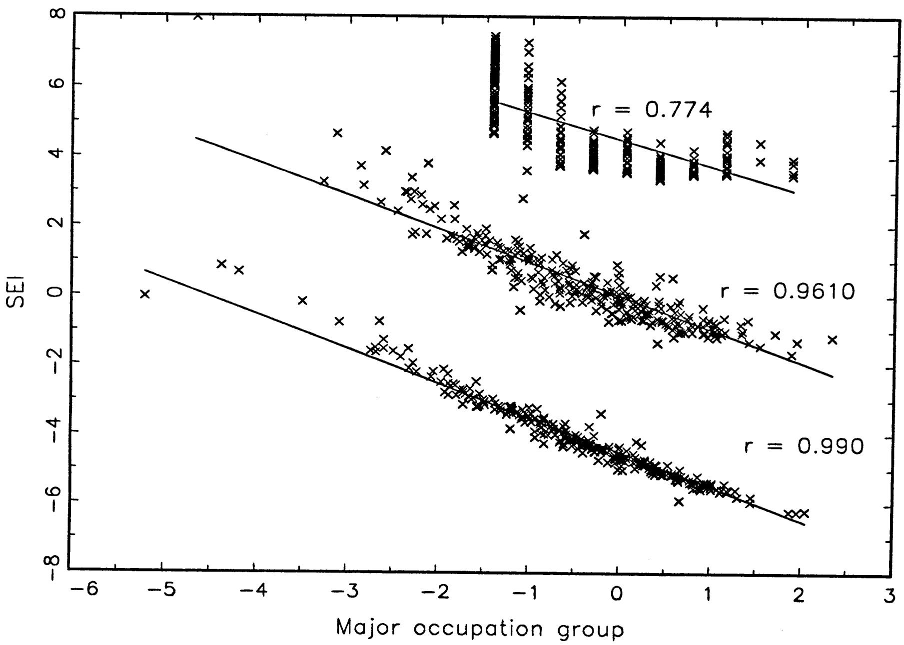
To obtain summary averages, one must replace the nominal categories with numbers, e.g., with some indicator of occupational inequality, such as SEI or Prestige, or with any other ranking over occupations. Taking averages as summaries is like "keeping score" to see who is ahead or behind in some overall ranking or league table. Hence, the term *scores* (and cognates like *scoring scheme*) will be reserved for any set of numerical values over occupations when these are applied as a preliminary to taking averages, while *averaged scores* will be reserved for the resulting rankings that describe the centers of the paths of least resistance.

The operation of taking averages for some scoring scheme applied to mobility counterparts, thereby obtaining a new ranking that can be used as subsequent scores, is the core of the Iterated Averaging algorithm. One minor adjustment is that any scores are first mean-centered for each of the origin and destination distributions. The iteration proper is then taking an average over each mobility counterpart, using the respective mean-centered scores for the origins and destinations components. This is repeated until further steps result in no change in ranking.

Figures 1 and 2 illustrate what happens. The scatters in Figure 1 are derived from the OCGII data, those in Figure 2 from the GSS data. In each figure, the topmost scatter is SEI (vertical axis) versus the tenfold census classification of major occupation group (horizontal axis) derivative of Edwards (1938).[11] The raw scales are strongly but raggedly related, with correlations of only about .78. In each figure, the middle scatter presents the averaged scores resulting from scoring the mobility counterparts with SEI (vertical axis) and the tenfold classification (horizontal axis), that is, one round of Iterated Averaging from two different starting points. Convergence is plainly apparent. The averaged scores are much more similar than the raw scales, with correlations of .937 (GSS) and .960 (OCGII). The bottom scatter shows the result of a second Iteration of Averaging, that is, taking averages again using the rankings recorded in the middle scatter as scores. The yet higher correlations of .975 (GSS) and .990 (OCGII) show that averaging is taking the different scales into arrays (of occupations) that are more evenly spread out and are rapidly approaching a correlation of one. Independent of what is initially averaged, Iterated Averaging is approaching a limit, a ranking called LimItAvg. As Table 1 shows, this is essentially the same as either of SSIC or the symmetric, generalized, binormal locations of Model II*.

The convergence of averages is central to the reconceptualization that animates this article. It links three central concepts. First, Duncan's discussion of stratification as cross-temporal brought two related and essential elements to the fore.

FIGURE 1



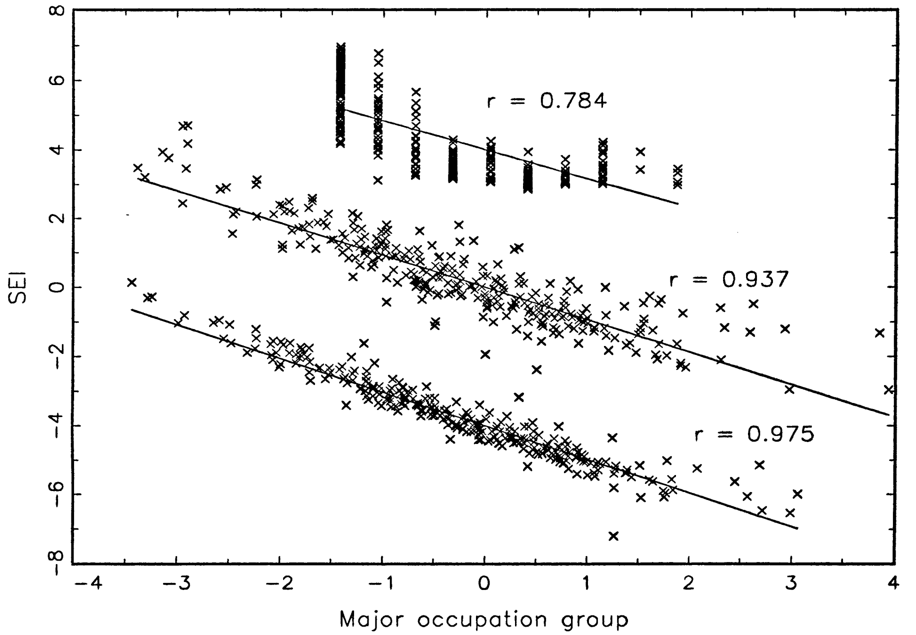
Note. Plots for occupations comparing SEI with Census Major Occupation Category (top scatter), comparing averages scale values for ancestors and descendents (middle scatter) and comparing averages of averages (bottom scatter). Results for 304 occupations based on data from OCGII. Top and bottom scatters are vertically offset by 4.5 scale units. All rankings are standardized.

Stratification refers to *persistence* of rank for *populations.* Either notion calls attention to averaging as a fundamental characteristic. Even in cross section, differentiation among populations refers to averages, not the details subsumed into averages. Over time, persistence requires resilience to disturbance or perturbation, and thus to an averaging out over a longer run. But against this backdrop, dominance acquires special connotations.

Dominance for a stratum does not directly refer to the concrete situation(s) found in cross section, including the multidimensional contrasts in asset mixes and reward modalities that differentiate occupations. Instead it refers to the linkage of an occupation into a stratum by smearing over a somewhat random assemblage of other occupations or its mobility counterpart.

Some insight may be gained with a heuristic model. Posit R_1,R_2 for two "structural" dimensions of occupational inequality (e.g., kinds of "resources"), linked (via appropriate scaling) into a simple, imperfect linear relationship, $R_1 = R_2 + d$, where the d are like regression disturbances. Simulate formation of a mobility counterpart by some random mechanism selecting values that center on

FIGURE 2



Note. Plots for occupations comparing SEI with Censur Major Occupation Category (top scatter), comparing average scale values for ancestors and descendents (middle scatter) and comparing averages of averages (bottom scatter). Results for 304 occupations based on data from GSS. Top and bottom scatters are offset by 4 scale units. All rankings are standardized.

some value, R_1^*. But the induced average value of R_2 will then be $R_1^* + \bar{d}$. Absent strong "filtering" in the mobility counterpart simulation, the average "residual," $\bar{d}$, will strongly tend toward zero. In such a manner, averaging tends to "accentuate" or purify linear relationships toward perfection.

One path of implication may sound paradoxical but isn't. The source of order is disorder, that is, the somewhat random mechanism of assembling mobility counterparts tends to ensure canceled errors over the collection. Strata, due to a mechanism not unlike that generating ecological correlations, tend to an orderliness that is greater than one might expect from the disorderly raw material. The convergence observed in Figures 1 and 2 was an empirical illustration. In words, when one assembles a mobility counterpart that is high or middle or low in average SEI, one has almost inevitably assembled a collection that is nearly exactly commensurate, on average, over the tenfold occupational classification.

A conundrum is apparent. Somehow, coarse, antique tenfold classification yielded new information, a close parallel to SEI differentiation. But, of course, it is tenfold serving only as a score, used for averaging, so it is averaging that yields the information. And by exactly the same token, SEI is but a score. In the heuristic model, both take on the role called R_2. As scores over mobility counterparts, these are converging to some center called R_1^*. In the heuristic model, this is by definition the point or value at the true center of the mobility counterpart, i.e., the dominance rank.

The last step may seem startling, but it is only an application of how dominance is defined, as the center of gravity of the mobility counterpart. Nothing rules out the possibility that for any particular occupation, the attraction point for averages might coincide with tenfold class, Prestige, or SEI value, although in general it could not coincide with all three, because for most occupations they differ. It is an empirical question how nearly any overall scale approximates dominance rank. (One conceivably could derive a correspondence between Prestige and stratum rank as a falsifiable prediction of the functional theory of stratification.) But as Table 1 shows, each of three differs somewhat from dominance.

Dominance rank, in the form LimItAvg, is a limit under averaging. This ranking, applied as a score to mobility counterparts, returns an averaged score that is (a perfect correlate of) itself. That is the inertia analog. The SSIC, and its cousins, are that set of scales that (nearly) perfectly summarize the corresponding paths of least resistance when employed to keep the score. Another name for this numerical array is the axis of occupational reproduction, for it most economically describes how occupations follow in sequence over lineages. And since the SSIC, by construction, locates occupations so as to maximize the intergenerational correlation, it precisely embodies Duncan's criterion of prediction.

If taken in isolation, this might seem vacuous, for who would want to belong to a higher stratum if all it tended to ensure was privileged access to SSIC rank? But that is not all that it ensures. For SSIC rank is the (limiting) average over the mobility counterpart, that list of hardly ephemeral occupations that marks off each stratum's longer-term fate.

And here the circle start to close. One can keep the score over mobility counterparts however one wishes, in Prestige or SEI or . . . . But it doesn't make much difference, that is, a mobility counterpart higher on average in one regard will tend to be commensurately higher in any other regard one cares to pick.

And what best anticipates or predicts? The lack of correspondence between other rankings and dominance plays a central role. For at least some occupations, dominance rank (SSIC) differs for example from Normative Resources (SEI). But that can only mean that these occupations have mobility counterparts that do not correspond to their Normative Resources rank. But then the average SEI over their mobility counterparts will not correspond or not be predictable from SEI, and average SEI will more closely correspond to dominance rank. And these will be errors in prediction using SEI, but not SSIC.

Table 2 provides empirical illustration for such generalizations in terms of correlations, for the GSS data, between occupational rankings in the two different

TABLE 2: Correlations of Various Occupational Scales with Average Origins and Destinations Scored by Various Scales

Panel A

Row Scale As Predictor of Average Destination Scored by Values of Column Scale

	GSS-SSIC	OCGII-SSIC	SEI	Prestige	Census 10
GSS-SSIC	.955	.915	.858	.793	.888
OCGII-SSIC	.860	.878	.830	.778	.849
SEI	.729	.760	.791	.759	.729
Prestige	.537	.582	.649	.687	.563
Census 10	.814	.807	.767	.724	.848

Panel B

Row Scale As Predictor of Average Origin Scored by Values of Column Scale

	GSS-SSIC	OCGII-SSIC	SEI	Prestige	Census 10
GSS-SSIC	.970	.937	.868	.727	.912
OCGII-SSIC	.853	.877	.829	.723	.829
SEI	.744	.771	.804	.751	.733
Prestige	.614	.645	.688	.709	.618
Census 10	.740	.758	.712	.626	.779

Note. Statistics based on 304 occupations as unit of analysis weighted to reflect sample frequencies in the NORC GSS, 1972-90, N = 6,061. Census10 is the tenfold coarse occupational classification of the U.S. Census derivative of Edwards (1938).

roles, as scales (in the rows of the table), and as scores averaged over mobility counterparts (in the columns of the table).[12] The mobility counterparts were further separated into averages over destinations (Panel A) and averages over origins (Panel B). The correlations reported in the table summarize how well each scale "predicts" the average mobility counterpart when the same or different rankings are used to score the mobility counterparts. Higher correlation reflects greater success at capturing D-stratification, or satisfying Duncan's predictability criterion.

A first noteworthy success is that of the OCGII-SSIC. In six of six possible comparisons (second row with diagonal entries, last three columns) the dominance measure from the earlier, independent sample more accurately captures D-stratification for assorted normative scores (more strongly correlates with the normative averaged scores), than do the normative scales with their averaged-score counterparts. The GSS dominance measure (GSS-SSIC) does better still, winning eight of eight comparisons (first row with diagonal entries, rightmost four columns).

Indeed, in nine of the ten columns, the SSIC measure is the scale that best predicts the score, that is, the scale that most closely recapitulates differentiation of average origins or destinations using various scores. One can unpack this to assorted generalizations, awkward sounding but true, such as "dominance rank better predicts persistence of SEI than does SEI rank." (The SEI scale is a slight winner for origins scored by prestige, but this unlike combination hardly justifies regarding this old standard as an accurate reflection of how positions persist in time.)

Thus the dominance hierarchy dominates assorted normative indices of occupational inequality in revealing D-stratification (here both the prediction and retrodiction of destination and origin) even when the outcome criterion is the competing normative index. What this means merits spelling out. A given bump up the dominance hierarchy has as a counterpart an almost exactly commensurate improvement in average dominance rank for origin and destination. Here we have the fine-print test for D-stratification, that changes — large, small, and in between — are accompanied by commensurate "effects." This qualifies the dominance family as "measures in the strong sense" of occupational stratification.[13] But further, that same bump up in dominance entails higher average SEI, prestige, or what-have-you. Thus greater dominance entails enhanced access to advantage, independent of how advantage is scored (how occupational inequality is indexed). What is more, said bump up in dominance enhances access to advantage more than does an equal magnitude bump up in SEI or prestige or ....

And should one prefer more dominance (more SSIC) to more Prestige, or SEI? Tastes enter, of course. But the more dominant occupation recruited from higher average Prestige, SEI, ... families. It must have some attractions. Something that swirls around it makes kids more effective competitors for success. Unpacked to such details, the SSIC construction is readily interpreted as reflecting broad occupational desirability.

While the dominance construct is closely connected by observed persistence with assorted earlier attempts to represent occupations as a hierarchy, it differs in one critical regard. The dominance hierarchy, that is, the numerical values that express it, is entirely implicit in (and estimated from) the details of succession within families across detailed occupations, i.e., the mobility counterparts. In each of the three alternative algorithms, these enter the analysis strictly as nominal distinctions. Thus absolutely no assumption, norm-laden or otherwise, about the essence of the occupational continuum is incorporated.

To fully understand the other algorithms, the sources giving the mathematical details should be consulted, but I will here attempt to convey some sense of how they work.

Model II* is estimated by the algorithm, described in Goodman (1979), that converges to Maximum Likelihood. Like most models that can be used for contingency tables, it includes parameters that represent row and column (fathers and offspring) marginal frequencies. Here, these serve as "controls for changing margins" but are not otherwise of interest. The distinctive portion is in the body of the model where probabilities of movement among each pair of occupations are represented. These are governed by an exponential term that inflates/deflates the probability as a function of the difference in vertical locations in a manner exactly analogous to a bivariate normal (Gaussian) probability distribution, which motivated Goodman (1981) to call this a generalization of the normal.

The scaled locations (dominance ranks) are fitted by adjusting until two averages match. The first average is taken over the empirical mobility counterpart (drawing on the provisional scaled values for each occupation found in the counterpart). The second average is taken over the expected values of the theoretical normal distribution for the occupation's row and column, so to speak over the "expected" or normal version of the mobility counterpart. At convergence, the average over the fitted normal surface, which for any occupation is an average conditional on that occupation's score or location, exactly equals the average over the empirical mobility counterpart. Accordingly, the fitted surface is a normal realization or estimate of the path of least resistance "carved" to and from the occupation, abstracted to a location within a normal hierarchy.

The exact algorithm for SSIC (defined in an appendix to Rytina 1992a) involves picky detail but the essence is reasonably simple. The details involve adjustments for unequal marginal variances and marginal means (i.e., turn on standardizing scaled locations relative to the contrasting distributions for fathers and sons), but the object is to locate occupations so that the correlation is at a maximum. This is achieved, for any occupation, when the predicted value matches the observed value. The predicted value is (a linear function of) the location estimated for the occupation, which, accordingly, is adjusted by the algorithm to match the observed value.

Observed values, for any occupation, come as a collection or set, namely the locations of other occupations that appear in the mobility counterpart. But the correlation turns solely on the average over the mobility counterpart, for the deviations about any such average cancel algebraically.

The trick, or grit, or purchase comes about by adjusting any occupation's provisional location (in the role of predicted value) with the average over the mobility counterpart (joint observed values). Thus, a tentative location, for some given occupation, is matched, compared, and adjusted to the numerically distinct average of the other (provisional) locations that appear in the mobility counterpart. This converges even from (most) random initial assignments of provisional locations. In general, order rapidly emerges. First, occupations that "exchange" with coarsely similar mobility counterparts, and hence have similar "observed values," are assigned similar "predicting values" — i.e., adjacent or roughly coincident estimated locations. As an intuitive handle, numerically frequent occupations, like Farm Owner and Tenant, which vary strikingly in their proportional role in mobility counterparts, serve as initial "anchors" for orientation and relative position, e.g., tending to "distance" those with "much farm" from those with "little farm" while dispersing intermediate concentrations in between.[14] As the algorithm continues, ever more minor refinements in locations percolate as a result of their appearance in mobility counterparts of other occupations. However, these damp rapidly, for generally any occupation is but a small part of any other occupation's mobility counterpart and has limited impact on the overall average. The point of convergence is most readily apprehended. At the end, any particular location is exactly matched, in the precise sense of predicted and observed values, with the average over the locations of the other occupations that make up its mobility counterpart.

The unifying element across the algorithms is taking averages over the nominal occupations found in the mobility counterparts of each occupation. Taking averages is mundane enough and further is inherent in any conception of strata as populations persisting in advantage. The benefit, perhaps not anticipated, is that averaging smoothes differences. Hence, different modalities of advantage are (to a good approximation) reduced to proportionally equal rates of advantage.

Perhaps this mathematical regularity shouldn't have been unexpected on conceptual grounds. For stratum refers to the longer run. Over that same longer run, as detailed situations give way one to another, what persists is not the complexity of particularities, but some ultimate average blending of power in all its modalities into a grand total.

However that may be, ranking occupations by SSIC, capturing persistence or long-run dominance, is operationally and conceptually distinct from alternative, norm-laden, conceptions of occupational hierarchy. The different scales are also empirically distinct. Table 1 shows that dominance least resembles idealistic prestige and more closely resembles the norm-flavored resource summary of SEI. And the stage is thus set to see how these alternatives map changes, if any, in occupational mobility.

Predicting Trends in Social Mobility

Theoretical developments anticipating change (or stability) in mobility may be divided into two broad strands, structural and institutional. Structural analysts, like Blau (1977) and Turner (1984), have suggested that mobility arises when barriers are limited and that barriers, in turn, are greater when inequality, in various dimensions, is larger.

This has strong implications for recent trend. The years 1973 to 1990 saw one of the largest increases in inequality of income, earnings, and wealth in U.S. history (Bound & Johnson 1992; Levy & Murnane 1992; cf. Williamson & Lindert 1980). Much of this increase was within occupations, but the economic differentiation of occupations also increased. This increase in dispersion strongly outpaced increases in explanatory factors, in particular, education.

Crisp implications then follow from the view that mobility is determined by structural conditions. Mobility should fall and the degree of occupational stratification intensify. Further, since economic differentiation increased while educational differentiation changed only slightly, a decrease in the efficacy of education as a means or determinant of status retention should occur.

Opposite expectations follow from the alternative institutional view. This stems from the work of Parsons (1940) and was given classic formulation in such works as Kerr et al. (1960) and Treiman (1970). The common conception of these authors was that individuals are allocated to occupations according to the norms animating mediating institutions. A major source of trend was the increasing scale and rationalization of economic activity. This would inexorably transfer control into large bureaucratic organizations. The consequent wider application of impersonal and rational criteria would favor universalism over ascription and thus lessen the importance of family background. Mobility should tend to rise and occupational stratification recede.

In these views, education plays a double role. First, as the criterion of choice for rational selection of personnel, it would play an ever more prominent role in occupational assignment. Second, this would reinforce universalistic rationalism, for it means that an increasingly large part of the sorting and selection of persons would occur within educational institutions, which were held to be arenas par excellence of impersonal evaluation.

Cross-Sample Comparison, Sampling Error, and Changes in Location

A central thrust of the critique of SSIC by Hauser and Logan (1992) was that differences between scales like SEI and SSIC could be attributed primarily to chance, which is to say to SSIC's capitalizing on sampling fluctuations or "errors." Of course, sampling fluctuations are logically inherent in any statistical estimation. However, sampling errors are, by common definition, unobservable quantities that are manifest only within a statistical model. Hauser and Logan offered no model. But Maximum Likelihood estimation, which identifies certain estimates from data with reference distributions like χ^2, provides such discipline. In this case, the relevant contrast is between uniform association using SEI locations and Model II*, or the dominance locations. In OCGII, the resulting G^2 is 1,665 (with 302 df, $p < 10^{-184}$), for the GSS data, G^2 is 910 (with 302 df, $p < 10^{-61}$). The chance that such differences are due to sampling fluctuation is remote.

Leaving aside the perils of advancing a sampling error interpretation without drawing on a statistical model, Hauser and Logan's mistaken conclusions rest on two fundamental errors. Their primary statistical device was to use the SSIC values of the first report to calculate a new correlation in a comparison sample and then divide it by the correlation obtained with SEI. When the resulting percentage increase in correlation of the original analysis failed to appear, they inferred a failure of "cross-sample validation."[15] But this implicitly assumed that the scale values in the first report were appropriate for other samples. This would be true only if the samples were comparable. Their first error was to fail to employ parallel sample definitions. In particular, the original sample included females while the OCG samples they used for comparison did not. Their second error was to not allow for the possibility that locations (and hence "true" scale values) could change.

The favorable consequences for SSIC of undoing the first error will be amply apparent in what follows. Once samples under comparison are restricted to males (an unfortunate limitation of the OCGII design), the increase in correlation versus SEI will replicate quite closely. Under many treatments, the increase will be larger for the replicate sample.

Some of the largest increases are fostered by undoing their second error and allowing for change in location. In the past, those employing inequality measures have implicitly assumed change to be negligible (on such sound empirical grounds as those summarized in Duncan 1968). Further, since father's occupation is fixed while adult occupation rapidly settles into slow changes with much individual stability, the primary dynamic process is population turnover of a few percent per year and changes seemingly must be quite gradual. But this reasoning need not extend to detailed occupations, for at least some might be subject to fairly rapid turnover, e.g., burger-flipping. And if one anchor for the normative view was the diachronic stability of prestige judgments (Hodge, Siegel & Rossi 1966), one might anticipate shifts when occupations are taken as loci of struggles over dominance. In any event, changes in dominance rank can be detected and incorporated into assessment of evolving patterns of stratification.

For carrying out an assessment of changes in rank, a first issue is to establish baseline ranks. The SEI is demonstrably inappropriate for this role for, as just reported, uniform association on SEI must be rejected as an adequate description of mobility when compared with Model II* in the OCGII data. The latter gives rise to a better baseline, OCGII-SSIC. Carrying this forward to the GSS data, the contrast in uniform association for SEI versus OCGII-SSIC yields a G^2 of 376.2, which with 1 df is wildly significant. Thus dominance rank estimated from the OCGII provides a far superior picture of mobility in the GSS.

An alternative stylization of the same result is that the GSS data yields correlations of .340 with SEI and .405 with the OCGII-SSIC values. This increase in correlation is 19.2%.[16] The comparable OCGII values are .368 for SEI and .450 for SSIC, for an increase of 22.5%.[17] Thus, the increase in correlation using the OCGII result in an independent sample is nearly identical. Of course, this result is logically free of method bias, in particular of the kind implied by Hauser and Logan's erroneous claim that the higher correlations observed with SSIC were due to capitalizing on sampling error.[18] The result demonstrates "cross-sample validity" in exactly the sense sought, but undiscovered, by them.

With regard to trend, however, SEI records a decrease of -7.6%, which is small but consistent with the kind of gradual decline in ascription that might be expected as the institutional order tends toward greater universalism. OCGII-SSIC reveals a slightly greater decline of −10%.

In the dominance framework, however, it is unnecessary to assume that previously established values (which are sample estimates for a specific cross section) describe occupational stratification in the subsequent sample. Indeed, estimation of Model II* for the GSS data leads to decisive rejection of the hypothesis that the OCGII values hold ($G^2 = 534.1$, df = 302, $p < 10^{-13}$). This justifies adopting the SSIC values specific to the GSS as describing occupational stratification in that sample, yielding a correlation of .48.

Since this involves 302 df estimated with only 6,061 cases, some reservations may remain about taking such conclusions at face value. Accordingly, I will provide two variants screening against possible "sampling errors," which will incidentally show that such concerns merit little weight in the overall result.

The starting point is a set of 304 estimates. With uniform association in OCGII-SSIC as a baseline, contrasting models were fitted allowing each occupation, by itself, to move to a new level describing its location relative to the baseline. The result is 304 1 df G^2 assessing the null hypothesis that each detailed occupation in the GSS remains at the specific level observed in the OCGII.

With 304 (nearly) independent G^2 jointly at issue, chance fluctuations must be allowed for. A very conservative scaling was constructed by first sorting the occupations by size, because sample frequency is a priori known to ensure more powerful tests. A primary decision rule (reject H_0 if $p < .01$) was then applied. But one would expect, on the null, that a result "too large" would occur by chance in every 100 instances examined. Therefore, the compound rule was to reject only if observed G^2 was large enough and less than 99 accepts had occurred. If 99 or more accepts had occurred, the next large G^2 was not rejected but accepted, and the count to 99 decremented by 99.

Under this rule, 15 occupations (of the 17 with $p < .01$) were selected. Maximum likelihood estimation allowing for these 15 departures from OCGII-SSIC yielded the Very Conservative scaling. This procedure is quite extreme proof against any possible contamination by sampling error. The standard of $p < .01$ is stringent, and two such are ignored. Much information recording genuine change is discarded, such as the substantial excess (versus chance expectation) of location changes with $.01 < p < .05$ and $.05 < p < .1$. This alternative thus represents rather extreme distaste for potential loss due to rejecting standard scales. This same extreme conservatism underscores the invalidity of the assumption of fixed scales, or unchanging occupational locations, in making comparisons of stratification between these two samples and the gap in time they span.

A less extreme or Moderately Conservative variant was also calculated by the coarser expedient of refitting locations for the 36 occupations with $p < .05$ (which

TABLE 3: Intercorrelations among Measures of Occupational Rank

	GSS-SSIC	Moderately Cons.	Very Cons.	OCGII-SSIC	SEI	Prestige
GSS-SSIC	1.00	.949	.932	.897	.763	.591
Moderately Conservative	.949	1.00	.983	.948	.800	.618
Very Conservative	.932	.983	1.00	.966	.817	.642
OCGII-SSIC	.897	.948	.966	1.00	.862	.695
SEI	.763	.800	.817	.862	1.00	.867
Prestige	.591	.618	.642	.695	.867	1.00

Note. Correlations using 304 occupations as unit of analysis weighted to reflect sample frequencies in the NORC GSS, 1972-90, N = 6,061.

logically are a superset including the 15 refitted for Very Conservative scaling). Although more occupations are refitted, the effect is less dramatic, since the added ones are typically less marked in departure from OCGII-SSIC. On the other hand, most of the remaining differences (i.e., between the Moderately Conservative scaling and GSS-SSIC) are modest in their impact on results.

Failure to reject H_0 for specific occupations is not the same as establishing that no change occurred but only that the specific change was too modest to clearly reject a possible explanation as chance fluctuations. Accordingly, in the following, I will employ wording that the truth lies in a range, such as "not less than" the Moderately Conservative result "and possibly as much as" the GSS-SSIC result. This will, incidentally, illustrate that the difference involved is generally small enough to neglect in future work.

Construct Validation

A central claim of this analysis is that the concept of dominance is distinct from Normative Resources. Empirically, that could be taken to require that dominance rank contrasts with SEI, and that such contrasts replicate over time — or here, across the two samples.

Table 3 shows how the dominance rankings compare with the two principal normative alternatives, SEI and Prestige. The correlations among different scales shows that the conceptual contrast, arguably an issue of the proper measurement strategy, is one with increasing substantive stakes. The estimated dominance ranks based on OCGII show a fairly sturdy .862 correlation with SEI, and a more modest correlation with Prestige of .695. For GSS, the divergence of dominance and inequality scales is greater, and increases smoothly as more revisions needed to

TABLE 4: Standardized Regression Coefficients and Multiple Correlations for Regressions on SEI and OCGII-SSIC of Occupational Ranks Estimated by SSIC Applied to GSS Data on SEI and OCGII-SSIC

Dependent	Independent		Multiple R
	SEI	OCGII-SSIC	
Very Conservative	-.059	1.017	.966
Moderately Conservative	-.067	1.00	.948
GSS-SSIC	-.038	.930	.897
	OCGII-SSIC *minus* SEI		
GSS-SSIC *minus* SEI	.984		.751

Note. Statistics based on 304 occupations as unit of analysis weighted to reflect sample frequencies in the NORC GSS, 1972-90, N = 6,061.

reflect the changing pattern in the GSS are incorporated. The overall GSS versus OCGII comparison shows that the pattern of occupational D-stratification is diverging from the normative rankings, so that correlations based on the normative scales are increasingly poor approximations to occupational stratification in the sense of predictability. Put otherwise, the pattern of occupational dominance less and less resembles hierarchies rooted in norms.

Table 4 reports results that are analogous to a demonstration of "construct validity." Multiple regression of SSIC results for the GSS on SEI and on SSIC results from OCGII show that the replicate dominance measure lines up very strongly with the prior application and shows essentially no net relation to the normative index. By the logic of multiple regression, this result means that differences (in the sense of residuals) between OCGII-SSIC and SEI line up almost perfectly with the analogous differences between GSS-SSIC and SEI. This is displayed directly in the last line of the table, which shows that the differences obtained by subtracting SEI from dominance rank in the replicate (GSS) sample parallel those in the source (OCGII) with a coefficient of almost exactly 1.0. Thus, earlier contrasts between the normative ranking and the dominance ranking replicate rather nicely. At the same time, the correlation of these residuals is "only" .751, showing that further divergences between dominance and the normative ranking appear as overall divergence grows.

TABLE 5: Results of Inferential Tests of Whether the Mobility Counterparts of Occupations Scored by SEI Differ from SEI Rank. Results from OCGII Used to Form *a Priori* Categories to Assess Replication with the GSS Data

A. Results for 304 Detailed Occupations

Bounds for OCGII z-statistics		No. of Occup. between Bounds	N of Cases in Occupations		Mean z-statistic Result		Overall z for GSS	Pr of GSS z
Lower	Upper		OCGII	GSS	OCGII	GSS		
-13.21	-5.00	2	4782	1289	-9.69	-5.19	-7.73	$< 10^{-14}$
-5.00	-4.00	3	1246	487	-4.68	-2.63	-3.57	.0002
-4.00	-3.00	2	37	18	-3.50	-2.50	-3.47	.0003
-3.00	-2.00	5	1491	660	-2.40	-1.49	-3.78	.0001
-2.00	-1.00	30	3104	1251	-1.40	-.77	-4.29	$< 10^{-5}$
-1.00	.00	82	5026	1863	-.46	.07	-.13	.44
0.00	1.00	83	6104	2189	.48	.27	2.30	.01
1.00	2.00	61	8250	3047	1.45	.49	4.32	$< 10^{-5}$
2.00	3.00	24	2403	892	2.43	.93	5.89	$< 10^{-8}$
3.00	4.00	6	1037	293	3.12	1.60	3.41	.0003
4.00	5.53	6	785	133	4.31	1.73	3.88	.0001

B. Results for the 214 Detailed Occupations that Appear Less than 30 Times in the GSS Data

Bounds for OCGII z-statistics		No. of Occup. between Bounds	N of Cases in Occupations		Mean z-statistic Result		Overall z for GSS	Pr of GSS z
Lower	Upper		OCGII	GSS	OCGII	GSS		
-13.21	-4.00	0	—	—	—	—	—	—
-4.00	-3.00	2	37	18	-3.50	-2.50	-3.47	.0003
-3.00	-2.00	0	—	—	—	—	—	—
-2.00	-1.00	19	912	237	-1.41	-.48	-2.33	.01
-1.00	.00	62	1807	681	-.43	.06	.03	.51
0.00	1.00	62	1786	595	.46	.26	2.17	.02
1.00	2.00	46	1656	531	1.45	.39	2.57	.006
2.00	3.00	16	685	164	2.36	.70	3.73	.0001
3.00	4.00	3	275	36	3.15	1.69	2.92	.002
4.00	5.53	4	501	39	4.35	1.83	3.64	.0001

TABLE 5: Results of Inferential Tests of Whether the Mobility Counterparts of Occupations Scored by SEI Differ from SEI Rank. Results from OCGII Used to Form *a Priori* Categories to Assess Replication with the GSS Data

C. Results for the 90 Detailed Occupations that Appear 30 or More Times in the GSS Data

Bounds for OCGII z-Statistics		No. of Occup. between Bounds	N of Cases in Occupations		Mean z-statistic		Overall z for GSS	Pr of GSS z
Lower	Upper		OCGII	GSS	OCGII	GSS		
-13.21	-5.00	2	4782	1289	-9.69	-5.19	-7.73	$< 10^{-14}$
-5.00	-4.00	3	1246	487	-4.68	-2.63	-3.57	.0002
-4.00	-3.00	0	—	—	—	—	—	—
-3.00	-2.00	5	1491	660	-2.40	-1.49	-3.78	.0001
-2.00	-1.00	11	2191	1014	-1.40	-1.25	-3.63	.0001
-1.00	.00	20	3220	1182	-.56	.09	-.19	.42
0.00	1.00	21	4318	1594	.54	.29	1.37	.09
1.00	2.00	15	6594	2516	1.47	.78	3.57	.0002
2.00	3.00	8	1718	728	2.57	1.40	4.75	$< 10^{-6}$
3.00	4.00	3	762	257	3.08	1.50	2.55	.006
4.00	5.53	2	284	94	4.23	1.53	2.27	.02

Note. Reported probabilities of are one-tailed hypotheses based on the OCGII grouping. "N of cases" is total frequency of reports of detailed occupations for fathers or sons.

Demonstrating Difference Even with Minimalist Method

Many principal novelties in this report have been demonstrated with relatively unfamiliar statistical constructs, often compounded together. Lack of familiarity may fuel skepticism that the results somehow stem from methodological error somewhere buried in that combination. Such skepticism can then inspire conviction that some or another untried, hypothetical analysis, often esoteric, time-consuming, or fraught with internal logical difficulties, would almost surely reveal a larger, even decisive, role for sampling fluctuation/measurement instability. In the nature of the case, one cannot demonstrate the negative proposition that no possible counteranalysis could avail. But in this section, I will try to strip away any methodological fog and reveal some rocks on which any counteranalysis is likely to founder.

Perhaps the most likely inspiration for skepticism is the empiricist critique of assessing occupational inheritance by regressions based on SEI. The core of that critique is the contrast between dominance and SEI ranking. Are such differences clearly distinct from the noise of sampling variability? And do they replicate, providing perhaps the strongest counter to any argument that the results are methodological artifacts? The goal of this section is to lay this core contrast bare using (relatively) unsophisticated methodological constructs. While the gist of what is to reviewed here can be inferred from material reported elsewhere in this article, further details may clarify the robustness of the key results.

The contrast of dominance versus SEI ranking can be cast as a species of regression residual, in two steps. First, to a good approximation, the dominance ranking for any occupation is proportional to the average of any inequality indicator, including SEI, over the mobility counterpart for that occupation, that is, the average SEI for the fathers of current incumbents along with the average SEI for sons whose fathers held the occupation. For any occupation, this is a conditional mean. The second step is to transform this into a residual of a regression, e.g., that of sons' SEIs on fathers, by subtracting the usual "expected value" derived from the overall regression. The result remains a conditional mean, namely, the average of the individual regression residuals for all the sons who share a specific father's occupation, and all fathers of sons in a given occupation. In aid of transparency and simplicity, the two portions, fathers and sons, are put on a common basis by expressing each in terms of standardized variates, so that one can form an overall mean based on fathers plus sons.

The resulting collective or average residual estimates whether dominance differs from Normative Resource endowment for any particular occupation. Of course, a slight approximation is involved, for average conditional SEI is not quite identical to dominance ranking, but as the first iteration of Iterated Averaging using SEI as start values (or scores), this was earlier seen to differ from dominance rank only modestly. It then follows that dominance rank is distinct from SEI insofar as regression based on SEI results in nonzero average residuals, that is, anomalous patterns of mobility "unexplained" by SEI rank.

Such averages, like all sample estimates, are subject to sampling variability. But the variability of averages can be modeled or controlled for via the normal "law" for sample averages, the Central Limit Theorem (CLT). The CLT requires some estimate of error variance. Ready at hand is the residual variance of the regression(s), which by standardization is a common value for father and sons. (Simplicity and transparency are best served by ignoring some obvious alternatives that would yield somewhat smaller standard error estimates.) The square root of the residual variance divided by the number of fathers plus sons whose residuals are averaged provides estimates of standard errors.[19]

This construction forms a sort of bridge between dominance ranking and the tradition of regression based on SEI. The averages, for given occupations, of individual residuals for regressions of occupations scaled by SEI are hardly exotic.

TABLE 6: Assorted Rank Values for All Detailed Occupations with SEI Greater than 70 (Top Panel) or SEI between 17 and 20 (Bottom Panel) and at Least 30 Observations in the NORC GSS 1972-90 Pooled Sample

Abbreviated occupational title	D.O.C.	SEI	OCGII-SSIC	GSS-SSIC	OCGII N	GSS N
Physicians	65	87.14	87.64	80.78	184	63
Lawyers	31	86.96	84.94	81.48	206	106
Elementary School Administrators	240	84.98	58.21	54.91	89	39
Electrical Engineer	12	78.32	60.17	48.95	183	77
Mechanical Engineer	14	76.21	61.73	57.49	113	60
Civil Engineer	11	75.33	58.51	66.37	110	53
Engineer, NEC	23	75.27	67.26	58.43	70	35
Secondary School Teachers	144	73.02	58.29	52.34	303	134
Industrial Engineer	13	71.62	63.70	52.32	89	43
Accountants	1	70.17	65.29	56.21	309	113
Shipping Clerks	374	19.49	31.60	33.61	177	76
Cabbies and Chauffeurs	714	19.44	32.52	51.16	97	33
Auto Repairers	473	19.19	25.05	27.29	530	195
Not Specified Operatives	695	18.93	11.86	28.22	110	109
Painters, Construction	510	18.58	30.61	36.19	300	103
Machine Operatives, Miscellaneous	690	18.43	20.03	23.27	561	130
Miscellaneous Operatives	694	18.34	20.77	23.75	265	66
Bulldozer Drivers	412	18.29	14.24	9.08	72	34
Barbers	935	18.19	33.65	42.76	147	34
Miners	640	18.16	8.59	9.44	342	186
Cooks, except Private	912	18.06	30.01	27.84	183	56
Machine Operatives, Not Specified	692	18.00	18.62	18.04	185	60
Assembler	602	17.57	24.52	23.03	298	95
Freight Handler	753	17.02	13.38	7.87	338	86

Note. D.O.C. is Detailed Occupational Category. Based on subsample sizes reported in the columns labeled N taken from the NORC GSS 1972-90 and the OCGII. All rankings are scaled to SEI for the GSS destination distribution with mean of 38.32 and standard deviation of 20.57.

TABLE 7: Intergenerational Occupational Correlations Using Various Scales for Annual and Cumulative Annual Samples of the GSS

Year	N	Prestige		SEI		OCGII-SSIC	
		Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
1972	429	.232	.232	.374	.374	.480	.480
1973	360	.243	.237	.278	.329	.407	.448
1974	319	.192	.224	.302	.321	.408	.437
1975	351	.246	.230	.289	.313	.351	.418
1976	347	.330	.250	.387	.327	.442	.422
1977	373	.241	.248	.311	.325	.371	.413
1978	361	.285	.254	.376	.332	.429	.417
1980	333	.294	.259	.423	.345	.461	.424
1982	397	.179	.249	.268	.336	.370	.417
1983	370	.319	.258	.374	.341	.426	.419
1984	303	.184	.252	.286	.337	.338	.413
1985	377	.236	.252	.329	.337	.418	.415
1986	347	.253	.254	.322	.338	.396	.414
1987	404	.331	.261	.383	.342	.422	.415
1988	331	.281	.262	.342	.342	.348	.412
1989	346	.247	.262	.287	.339	.305	.406
1990	313	.278	.263	.338	.340	.353	.405

Anyone with access to some data and to standard software can readily calculate them. And little could be more straightforward than the CLT applied to averages.

The robust centrality of this procedure should be emphasized. As shown above, averaging SEI (or most any inequality indicator) over the mobility counterparts estimates occupational dominance reasonably well. But averages are governed by the CLT, which follows from very weak assumptions, and comes into force once subsample frequency passes a modest threshold. Furthermore, the CLT is the limiting case to which all manner of statistical models converge, with sufficient sample size. Thus, whatever shows up under the aegis of the CLT, once over the generally modest threshold for sample size, will dictate parallel or analogous rejection of the null under any acceptable modeling strategy.

The starting point for the results presented in Table 5 is the OCGII data. The 304 mean residuals, capturing the contrast of dominance with Normative Resources but using SEI over the mobility counterpart as indicator of dominance, were divided by the occupation-specific standard errors yielding a z-statistic for each occupation. The tabulation summarizes ten graded categories, ranging from "strongly significant" dominance less than SEI through null or neutral results for

TABLE 7: Intergenerational Occupational Correlations Using Various Scales for Annual and Cumulative Annual Samples of the GSS (Cont'd)

Year	Very Conservative		Moderately Conservative		GSS-SSIC	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
1972	.518	.518	.532	.532	.576	.576
1973	.453	.488	.483	.509	.536	.556
1974	.411	.468	.419	.486	.485	.538
1975	.391	.452	.397	.467	.464	.523
1976	.454	.450	.494	.470	.502	.518
1977	.388	.440	.394	.457	.418	.503
1978	.445	.442	.453	.458	.448	.497
1980	.486	.449	.493	.463	.545	.504
1982	.436	.447	.440	.460	.500	.503
1983	.440	.446	.459	.460	.487	.502
1984	.378	.442	.403	.456	.410	.496
1985	.446	.443	.463	.457	.484	.495
1986	.432	.443	.449	.458	.491	.496
1987	.441	.444	.424	.456	.434	.492
1988	.329	.438	.342	.450	.390	.486
1989	.296	.431	.326	.444	.365	.481
1990	.392	.430	.410	.443	.456	.480

Note. Based on the NORC GSS, 1972-90. Columns labeled "Annual" report correlations for single years while columns labeled "Cumulative" are for all years up to row year.

occupations where the two constructs are approximately equivalent, on out to "strongly significant" dominance greater than SEI.

In a manner of speaking, it is not possible to single out just exactly which occupations reveal contrast, because statistical inference authorizes probability statements, not certainties.[20] However, it is clear that the overall amount of contrast greatly exceeds that which could be plausibly attributed to sampling variability.

In a domain less fraught with consequence, it would probably suffice to produce results based on one sample, screened by inferential statistics. But the left columns of the table provide yet more decisive evidence: replication. For this part of the display, the OCGII results were adopted as a logically independent or a priori framework for grouping the GSS results. The seventh column reports the average of the z-statistics from the GSS for the occupations that fell within each tabulated range of "significance" with the OCGII data. The contrast of dominance versus SEI observed in OCGII is paralleled, step by step, by the GSS results. Not only do occupations that show larger (more "significant") differences in OCGII show up with directionally consistent residuals in the GSS, but equally the clump toward the center that recorded "nonsignificant" differences in OCGII closely parallels this performance in the GSS.

Unsurprisingly, the GSS z-scores are generally smaller, for they are based on smaller subsamples and thus have larger standard errors. As above, in a manner of speaking, one is hard pressed to sustain definite conclusions about specific occupations. For example, if some isolated occupation had a z-score exactly equal to the average reported for several of the OCGII-based groupings, the null could not be rejected.

Overattention to such details may tend to obscure the whole. Because the OCGII categorization is logically a priori, the occupations grouped together constitute statistically independent trials with the GSS. More generally, some variant on statistical independence of estimates for distinct occupations in the replicate sample will pertain in any model of sampling error or measurement instability. But, again across modeling strategies in general, the results of independent trials can always be added to implement an overall test. In the present instance, this leads to taking an overall average residual for the several occupations grouped in each OCGII category (which under the null have mean zero and common variance, as above), resulting in the z-statistics reported in column eight. The improbability of the observed results (in column nine) is quite extreme.

Another source of concern (or skepticism) could be the very small case bases for some detailed occupations. This is addressed by separating occupations that occur less than thirty (Panel B) or thirty or more (Panel C) times in the GSS. The small occupations reveal considerable pattern. But the large occupations further reveal what could be termed a *robust core*, for example, occupations that combine z-statistics in the OCGII of $> |2|$, overwhelming evidence of replication, and ample cases in either sample even for single occupations taken in isolation. Such ample case base not only brings the CLT into force but renders moot any niceties about asymptotic convergence or the like. One can further see (by addition over the table) that these frequent, "significantly" contrasting, occupations account for some 29.0% of all occupational codes in the GSS (in contrast with the 2.1% of all codes for their infrequent counterparts). Hence, the *robust core* carries the bulk of any contrast in covariances for dominance ranking versus SEI.

The *robust core* is an empirical counter to assorted intuitive suspicions, for example, about "too many parameters estimated from too few cases." It exhibits replication across samples that will gainsay any attempt to assimilate the pattern to any model of measurement instability. It is unlikely that any amount of tinkering with alternative procedures will make this vanish. Within the *robust core*, one encounters replicating anomalies in regressions based on SEI that are not artifacts of specific method, sampling errors, or dependent on small subsamples. Any proposed or hypothetical alternative method can, at most, fiddle with peripheral details, not somehow invalidate simple averages, based on ample cases, modeled by the CLT. The central contrast, dominance versus Normative Resource

TABLE 8: Percent Change in the Intergenerational Occupational Correlation versus the .3675 Found with SEI in OCGII for Annual GSS Samples Using Different Occupational Scales

Year	N	Prestige	SEI	OCGII-SSIC	Very Cons.	Moderately Cons.	GSS-SSIC
1972	429	-36.9	1.8	30.6	41.0	44.8	56.7
1973	360	-33.8	-24.4	10.8	23.4	31.3	45.7
1974	319	-47.8	-17.9	11.0	11.9	14.1	32.0
1975	351	-33.1	-21.3	-4.5	6.5	8.1	26.3
1976	347	-10.1	5.4	20.1	23.5	34.5	36.7
1977	373	-34.5	-15.3	0.9	5.7	7.2	13.8
1978	361	-22.4	2.3	16.6	21.1	23.2	22.0
1980	333	-20.0	15.0	25.4	32.2	34.0	48.2
1982	397	-51.3	-27.0	0.7	18.7	19.7	36.1
1983	370	-13.1	1.7	15.9	19.7	25.0	32.6
1984	303	-49.9	-22.2	-8.0	2.7	9.5	11.4
1985	377	-35.8	-10.4	13.7	21.4	25.9	31.6
1986	347	-31.3	-12.4	7.7	17.5	22.2	33.6
1987	404	-9.9	4.1	14.9	20.1	15.4	18.1
1988	331	-23.4	-7.0	-5.3	-10.5	-7.0	6.2
1989	346	-32.9	-22.0	-17.0	-19.4	-11.2	-0.7
1990	313	-24.4	-8.2	-4.1	6.6	11.4	24.0
Medians	351	-32.9	-10.4	10.8	18.7	19.7	31.6

Note. Percentages based on the annual correlations reported in Table 6. Bold-faced entries (> 22.5%) record increases in intergenerational rigidity versus OCGII. Underlined entries are 2 standard errors greater than the SEI correlation for the annual sample and, by a coincidence of criteria, also exceed the increase in correlation for SSIC over SEI observed in the OCGII. Such percentage contrasts with the SEI correlation may be obtained by subtracting the entry in the SEI column from any percentage reported in the table.

endowment, is open to alternative conceptualizations, or possibly statistical nuance, but it has a basis in empirical observation that is not really open to doubt.

Inspecting Illustrative Contrasts and Convergences

A counterpart to the overall results are those for specific detailed occupations. Of necessity, illustration must be selective, not exhaustive. Table 5 reports on all occupations above a size threshold (30 or more observations for origins plus

TABLE 9: Integenerational Occupational Correlations for Various Scales for 1972 to 1986 and 1987 to 1990 Subsamples of the NORC GSS with Tests for No Difference

	1972-86	1987-90	Z-statistic	Probability
Prestige	.254	.287	1.18	.239
SEI	.338	.338	.01	.988
OCGII-SSIC	.414	.363	-2.00	.046
Very Conservative	.443	.368	-2.93	.003
Moderately Conservative	.458	.377	-3.22	.001
GSS-SSIC	.496	.411	-3.52	.000
N	4,667		1,394	

destinations in the GSS data) found in two "interesting" ranges of SEI, all above SEI of 70, and a "blue-collar" or "working class" subrange of SEI 17 to 20 inclusive.

With 304 occupations, two samples, and ten+ scales, any selection that is compact enough to inspect can only approximately represent the overall results. Further, occupations are delightfully complex objects, and any such list will suggest many hypotheses, most of which would require further investigation (leave aside the complexities masked by a partial listing). A hypothesis apparent here is a possible contrast between occupations of longer job tenure, like the two kinds of educators that appear in the table, where dominance rank is very similar across samples, and occupations that are probably subject to a great deal of flux. Cabbies, for example, might draw on students, those looking for other work, or moonlighters whose other job evaporated. Thus, the population found within the label might vary quite rapidly with the business cycle and so forth. In another vein, "Not Specified Operatives" stand out as appearing at near identical frequency in the much smaller GSS, thus nearly tripling in relative frequency across the two samples. Contrasting coding practice may be indicated, perhaps reflecting the intrinsic fuzziness of the title. Unlike a fixed scale, the dominance procedure responds by reflecting the relative location of the code, as applied, within the overall pattern of stratification. Similarly, Barbers shrank in relative frequency, and perhaps the "weaker" were differentially pruned out. However, one should not allow such speculative "trees" to overshadow the overall "forest" of pattern.

Two overall generalizations are readily apparent. Dominance is broadly similar to SEI but far from identical. For most occupations, the replicate dominance measures are more similar to each other than to the SEI. Some changes in dominance are apparent.

In the first panel, reporting the top end of the SEI distribution, five engineering occupations appear. All enjoyed substantially lesser dominance than normative rank in OCGII data, and all, except for Civil Engineers, saw an erosion of their placement with respect to advantage in the later GSS data, a change closely paralleled by that for accountants. Physicians and Lawyers occupy their anticipated lofty position, with dominance to match their rank in terms of Normative Resources. But Elementary School Administrators, who have nearly identical, highly favorable, endowments of Normative Resources, are very much less dominant and share nearly identical dominance rank (in present terms, share a stratum) with Secondary School Teachers.

The second panel depicts a very narrow range of Normative Resource endowments containing "working class" or "blue-collar" occupations. But one can see that the market segments grouped by this standard are not remotely equivalent in dominance. Barbers, Cabbies, Painters, and Shipping Clerks are substantially above an assortment of industrial or factory occupations, while Miners fall well below.

In both ranges, discrepancies of 30 or more points in dominance are apparent among occupations with equivalent rank in the normative hierarchy. (All values are scaled to SEI, where the difference between top and bottom is 76.87 "points." Thirty "points" is thus hardly trivial.) When, for example, a Painter's son becomes an Elementary School Principal, a huge upward shift is recorded in Normative Resources, making a large contribution to the unexplained variance recording "fluidity." Yet this is spurious. Observed movements from SEI circa 17 to SEI circa 85 are far more likely to involve specific subsets of occupation at either SEI level, and which occupations do the "exchanging" and which are "excluded" from it is a persisting trait of the occupations. Thus, Miners' sons do not become Physicians in due proportion to the SEI difference, and the empirical movement between these levels of Normative Resources is far more likely to involve "exchanges" from occupations already more advantaged than Miners to others that are persistently in strata well below that of M.D.'s.[21]

The illustrations show that rates of movement that occur between levels of the normative hierarchy of SEI must not be taken as applying equally to all the occupations that share those Normative Resources levels. The heterogeneous dominance ranks found within SEI levels correspond with a very high degree of precision to differences in the average rank of the mobility counterparts, and thus to actual mobility experiences. The difference in observed fluidity between occupations, and the fluidity between levels of Normative Resources that is spurious from the standpoint of detailed occupations, is exactly that summarized by the difference in overall intergenerational correlations. The table serves as reminder that such contrast in overall intergenerational correlations ultimately refers to observable differences in the mobility experience of specific occupations.

TABLE 10: Measures of Consistency between Deviations of Observed Mobility versus OCGII-SSIC for Each Annual GSS Sample (YrAddF) and Such Deviations Summed over Other Annual GSS Samples

	Statistics Based on Row Year Regressed on							
	Sum of All Years Except Row Year				Sum of 1972-86 Except Row Year if before 1987		Sum of 1987-90 Except Row Year if after 1986	
	r	Regression Coef.	t	Pr	t	Pr	t	Pr
1972	.375	2.87	8.37	.000	10.90	.000	-3.91	.000
1973	.178	1.50	3.43	.001	4.97	.000	-4.20	.000
1974	.067	.53	1.20	.229	2.01	.044	-1.97	.049
1975	.064	.46	1.19	.234	1.38	.168	- .61	.544
1976	.219	1.52	4.16	.000	7.66	.000	-6.75	.000
1977	.067	.35	1.29	.198	4.06	.000	-6.18	.000
1978	.100	.46	1.91	.056	2.05	.040	-.26	.798
1980	.136	.96	2.50	.013	3.18	.001	-2.02	.044
1982	.284	1.96	5.88	.000	6.71	.000	-1.82	.068
1983	-.102	-.77	-1.96	.050	-4.19	.000	5.32	.000
1984	.215	1.11	3.82	.000	3.14	.002	1.71	.087
1985	.189	1.10	3.73	.000	7.42	.000	-7.52	.000
1986	.175	.98	3.31	.001	3.44	.001	.20	.845
1987	-.059	-.31	-1.19	.235	-2.20	.028	3.21	.001
1988	.022	.12	.40	.688	-1.45	.147	4.65	.000
1989	-.343	-2.54	-6.77	.000	-5.64	.000	-3.53	.000
1990	.167	.90	2.98	.003	2.27	.023	1.74	.082
Medians								
1972-86	.175	.975	3.31	.001	3.44	.000	-1.97	.043
1987-90	-.018	-.097	-.39	.119	-1.82	.025	2.47	.000

Note. The column labeled r reports correlations for each year's YrAddF with the sum for all other years. That labeled regression coefficient reports the regression coefficients for each annual YrAddF on the sum of all other years, followed by corresponding t statistics and probability values. The 4 left columns are t statistics and probability values for each annual result regressed on the sums for 1972-86 and 1987-90, with the focal year excluded from the sum where logically possible.

TABLE 11: Intergenerational Occupational Correlations Using Additive Approximations to GSS-SSIC Based on 1972-86 and 1987-90 Compared with Annual GSS-SSIC Correlations

	Approximation to SSIC based on 1972-86		Approximation to SSIC based on 1987-90		Overall GSS-SSIC
	r	Percent vs. SSIC r	r	Percent vs. SSIC r	SSIC r
1972	.572	-.6	.467	-19.0	.576
1973	.491	-8.3	.396	-26.0	.536
1974	.503	3.7	.372	-23.4	.485
1975	.442	-4.7	.332	-28.6	.464
1976	.525	4.5	.416	-17.2	.502
1977	.406	-2.8	.325	-22.3	.418
1978	.457	2.0	.392	-12.6	.448
1980	.552	1.3	.435	-2.1	.545
1982	.511	2.1	.348	-3.4	.500
1983	.483	-.9	.434	-11.0	.487
1984	.426	3.9	.342	-16.4	.410
1985	.499	3.2	.376	-22.3	.484
1986	.474	-3.5	.391	-2.4	.491
1987	.326	-24.9	.529	21.8	.434
1988	.290	-25.6	.450	15.3	.390
1989	.284	-22.1	.428	17.2	.365
1990	.351	-23.0	.468	2.8	.456
Medians					
1972-86	.491	1.3	.391	-20.4	.487
1987-90	.308	-23.9	.459	16.2	.412
Cumulative					
1972-86	.495	-.0	.393	-20.8	.496
1987-90	.311	-24.3	.473	14.6	.411

Note. The additive approximations to GSS-SSIC are baseline OCGII-SSIC plus the sums of YrAddF for 1972-86 and 1987-90, respectively. The columns labeled r contain the correlations using one of the approximations to GSS-SSIC. The column labeled "SSIC r" reports the correlations using overall GSS-SSIC. "Medians" are median results across annual samples. "Cumulative" reports the results for pooling the designated annual samples.

TABLE 12: Changes in the Role of Education As Mediator of the Intergenerational Reproduction of Occupational Rank

		Correlations			Path Coef.'s		Percent Direct Effect
Scale	Sample	Pa ↔ Ed	ED ↔ Off	Pa ↔ Off	ED → Off	Pa → Off	
Prestige	OCGII	.311	.578	.262	.550	.091	.347
	GSS	.308	.572	.263	.542	.096	.366
SEI	OCGII	.393	.638	.368	.584	.138	.375
	GSS	.388	.642	.340	.601	.106	.313
OCGII-SSIC	OCGII	.456	.605	.450	.505	.220	.489
	GSS	.435	.596	.405	.518	.180	.444
Very Conservative	GSS	.432	.577	.430	.481	.222	.518
Moderately Cons.	GSS	.432	.572	.443	.468	.241	.544
GSS-SSIC	GSS	.425	.539	.480	.409	.306	.638

Notes. Results for OCGII based on 17,118 cases. Results for GSS based on 6,061 cases from 1972-90 cumulative sample.

Measures of the Changing Degree of Occupational Inheritance

For the OCGII sample, collected in 1972, the intergenerational correlation of occupational prestige was .262. This was substantially below the .367 correlation of occupational SEI, while the .450 correlation of SSIC is 22.5% above the SEI result.

The results for the pooled GSS sample are shown in the columns labeled "cum" (reporting the intergenerational correlations for cumulated annual samples) and the row for 1990 in Table 7. Prestige shows a negligible increase of .4%.versus OCGII. The decline for SEI to a correlation of .34 is a modest –7.6%. This is not a very large change, but as noted above it appears within a context of exact measurement and prestigious theorizing, which highlights this as a powerful confirming instance.

The direct measurement of occupational stratification by SSIC reveals a different pattern. The OCGII-SSIC measure reveals an intergeneratinal correlation of .405 in the GSS. While this is 19.2% larger than the result with SEI, it is a decline from the OCGII result of –10.0%. But this apparent decline rests on the false assumption that occupational rank does not change and that no difference among samples or periods need be accommodated. The narrow changes implicit in the "Very Conservative" approach to changes result in an intergenerational correlation of .430 and a decline of only –4.3%. The .443 correlation from a "Moderately Conservative" approach is wholly negligible decline of –1.5%. Fully allowing for changes by unrestricted application of SSIC in the GSS results in an increase of +6.6%. This is a modest increase, at most. A comparably modest conclusion is that between these two samples, occupational stratification is nondecreasing and may even be increasing.

Another way of looking at trend is examination of the year-by-year results. These are presented as contrasts with the OCGII SEI result in Table 8. Caution must be used in approaching these, for they are based on limited samples with a median size of 351. The standard error of a correlation of .4 for this sample size is .044. Two standard errors is therefore 22.0%.

The results for SEI show that decline was apparent in 11 of 17 years, that 4 exceed the –22% needed for .05 attained significance, while the instances of increase are both fewer and comparatively modest. In Table 8 it is further apparent that the series began with noticeable decline, seemingly confirming such expectations, but later results softened the overall contrast.

For the dominance scales, the boldface entries record year by scale combinations where the intergenerational correlation is greater than that found with SSIC in the OCGII (i.e., entries that exceed the 22.5% "gain in correlation" for SSIC over SEI in OCGII), and thus record increases in occupational rigidity versus OCGII. This occurs only twice using OCGII-SSIC, four times using Very Conservative, seven times with Moderately Conservative, and eleven times using GSS-SSIC. Furthermore, the confirming instances occur early, while the disconfirming instances occur later, with 1989 and 1988 as standouts, and 1990 as somewhat less spectacular.

This suggests special attention to the results cumulated to 1986 (reported in Table 8 above) before the "disconfirmations" started to appear.[22] For OCGII-SSIC, the result versus SEI is an increase of 22.5%, a replication to 3 digits of the OCGII result. This exact parallel means that the OCGII-SSIC exactly mimics SEI in showing a decline in correlation of –8%. But Very Conservative registers an utterly negligible –1.6% decrease in occupational stratification, Moderately Conservative results in an equally negligible +1.8%, while GSS-SSIC records an increase of 10.2%. Over this first fifteen years, "nondecreasing or even increasing" rigidity is clear, and the weight on the qualification may be reduced.

Over this same period, a downward trend is apparent. The correlation of the annual intergenerational correlations with time is –.368 for GSS-SSIC, –.232 for moderately conservative, –.295 for very conservative, and –.299 for OCGII-SSIC. With only 13 data points, none of these remotely approach statistical significance. But even as an indication, they supply only fatally compromised support for the thesis of a long-term downward trend. Except for OCGII-SSIC, all approach the baseline of a correlation of .45 from above. (Even the former shows this pattern at the very outset.) This is not evidence of any continuing decline but, at most, a recession to the earlier level.

Table 9 shows that the later samples, 1987 to 1990, are another story. The contrast of correlations using the dominance scales versus the normative scales is much diminished. While the SEI correlation registers no contrast, all the dominance scales show statistically significant declines. The advantage of very conservative or Moderately Conservative over unrevised OCGII-SSIC disappears. GSS-SSIC still yields a result well above that for SEI, but very much below the result in the earlier samples.

Untangling Evidence of Massive Change in Occupational Stratification from 1987 Onward

There is clear indication of change in stratification. But two alternatives must be weighed. Perhaps the rigidity apparent with OCGII-SSIC, and replicated in the GSS, has simply given way, and mobility has dramatically increased. However, another possibility is that rigidity remains but the relative positions of occupations have changed.

This second possibility is analogous to what has been described above for the overall contrast of the OCGII and GSS data. The SSIC results of OCGII replicate, but some changes are also apparent. If such changes are ignored, rigidity seems to decline. But this is misleading. What the revised scales reveal is that the overall macroscopic rigidity is "nondecreasing or even increasing." What changes is not rigidity but the locations of occupations in the hierarchy of dominance.

This notion may be unsettling to some. For example, it implies that a specific father-offspring transition that was, say, upward mobility within OCGII has become downward in the GSS. Yet no change might have occurred for some specific individual, for example, one whose job was unchanged over the period. But from another viewpoint, this is perfectly reasonable. What has changed is the typical incumbents of said occupation. Implicitly, the position of the whole category has shifted, for example, as low-status-origin recruits replaced or displaced those of higher origin. Then the protagonist of this illustration has ridden down with the (changing) lot of them by failing to follow origin-peers as they left for greener pastures.

Furthermore, such changes are quite modest, involving limited shifts for limited occupations. For example, the median correlation among the four dominance scales is .948 (see Table 3). The measuring rod is elastic, but only slightly so.

The small annual samples offer limited analytic possibilities. In any annual sample, only a median 173 of the 304 occupations appear. The median number of observations (fathers plus offspring) for occupation by year combinations is 1, while the mean is only 2.35. Under these conditions, the SSIC algorithm does not converge (to reasonable values) and thus only tentative results using improvised methods are feasible. However, these are reported as a lead for future research pointing to the tantalizing possibility that a dramatic shift in occupational stratification was underway in the late 1980s.

The baseline for assessing year-by-year evidence of change is the relatively accurate OCGII-SSIC results. As these account for 80.5% of the variance in the GSS-SSIC values, evidence of change is restricted to the 19.5% of variance that is residual. To break this down into annual values, I constructed a function (called YrAddF)[23] of the contrast of each year's data with the baseline. The sum across all annual samples of YrAddF accounts for 80.9% of the residual variance. The correlation of GSS-SSIC with OCGII-SSIC plus the sum for all years of YrAddF is .981, so the degree of approximation is quite respectable.

YrAddF captures, for the tiny number of observations in each year by occupation combination, the direction and degree to which the observed mobility pattern departs from the expected pattern based on OCGII-SSIC. Since these expectations are generally quite accurate and the subsample sizes are very small, one might expect the annual results to be very noisy. But as Table 10 shows, when the revisions in rank for annual samples captured by each year's YrAddF are correlated with the logically independent sum of such revisions summed across all other annual samples, considerable pattern is apparent.

The second column reports the correlation between each annual sample's deviations around OCGII-SSIC (YrAddF) and the sum over all other years of this linear predictor of scale revisions. The third column reports regression coefficients when the summed measures for all years except the focal year are used to predict the focal year. A positive value means that the departures from OCGII-SSIC ranking in a given annual sample are corroborated by the logically independent sum of the revisions from the other annual samples.

For the first 13 samples (1972-86) corroboration is striking. For the median result, one may reject the null at $p < .01$. Five of the 13 warrant rejection at $p < .0005$. Tellingly, such decisive rejections occur for samples as late as 1985 and 1986. But the later samples record a stunning reversal. 1987 and 1989 are *negatively* corroborated, with 1989 a spectacular instance with $p < .0005$. The last four columns emphasize the break. Corroboration is generally stronger when each of the first 13 samples is compared with the sum of the other 12, and more strongly negative when the last 4 are compared with the first 13. The first 9 samples (up through 1982) negatively corroborate the last 4, while positive corroboration shows up (albeit usually weakly) from 1983 on. The latter 4 are modestly mutually corroborative, although 1989 remains a sample apart.

A key implication arises from noting that the correlation over annual samples of the GSS-SSIC intergenerational correlation and the measure of corroboration in the third column is .748. Insofar as a sample is positively corroborated by the independent results for the other annual samples, that year reveals a higher GSS-

SSIC correlation, which sustains the interpretation of the resulting increases in sample-year correlation as real. Conversely, annual samples that fail to yield increases in intergenerational correlation using overall GSS-SSIC are those that are anticorroborated.

Note, however, that such "anticorroboration" cannot be dismissed as arising by chance alone, or sampling accident. The later samples are genuinely distinct. They are too sparse in observations to reliably assess whether they are internally consistent, but they do show positive internal corroboration.

Table 11 reveals annual and cumulative results when the summed YrAddF for each of the two periods, 1972-86 and 1987-90, are added to OCGII-SSIC to obtain revised ranks specific to the two periods. The difference against overall GSS-SSIC is minimal for the early years, but large for the later. Although some imbalance is due to the uneven split of 13 versus 4 years, an immense asymmetry in time is evident. Even though the overall result folds in the data of the later years, they are "too different" from the overall average, while the overall scale and the approximation based on the first 13 samples coincide. Conversely, when the intergenerational correlation for the latter years is calculated drawing exclusively on their summed four YrAddFs, the intergenerational correlation rises sharply to .473, well above the .411 apparent with overall GSS-SSIC. This is below the .493 apparent when the early 13 are given parallel treatment, but it is also greater than the .450 OCGII baseline.

The overall conclusion is twofold. The 13 samples (1972-86) of GSS subsequent to OCGII show that stratification was clearly nondecreasing and quite likely increased. The 4 subsequent (1987-90) samples suggest that a fairly abrupt shakeup in the pattern of occupational stratification set in. Allowing for the indicated alterations in relative position, the degree of stratification remained above that observed in OCGII, but there is too little data to determine whether it is greater or less than was apparent in the immediate past.

These last results must be regarded cautiously, as they are based on small samples and somewhat ad hoc methods. The only certainty is that occupational stratification is sharply different in the latter samples. More tentatively, the change appears to be yet further shift in relative rank, and not the increase in fluidity seemingly apparent on first inspection.

The Declining Role of Educational Mediation

A central component in the alleged decline of ascription is the claim that schooling looms ever larger as the primary means of rank reproduction. Table 11 retells the story, contrasting the dominance rankings with the normative alternatives.

All scales show a decline in the inheritance of education as measured by the correlation with father's rank. However, the degree of inheritance differs

differs considerably. Father's prestige matters least, father's SEI is intermediate, while those in more dominant occupational strata obtain relatively greater educational advantage, albeit in a degree that is diminishing.

The increase in current occupational returns to education anticipated by the institutional theory is apparent only with SEI, and the increase is negligible. Prestige shows a very small decline, while OCGII-SSIC shows an equivocal gross decline and increased net effect. The largest contrasts in returns to education are those apparent with scale revision. The more that rank is rearranged to reflect recent occupational stratification, the less current incumbency depends upon education.

Both the inheritance of education and occupational returns to education reveal patterns that sustain substantive expectations for the dominance rankings. First, higher dominance confers educational advantage in greater measure than does rank of origin in the normative hierarchies. Evidently, paths of least resistance cut through the groves of academe and dominance takes one further than normative standing. Second, occupational dominance or superior stratum was more responsive to education than was occupational prestige in the OCGII result, but the change over time implicit in scale revisions reveals that such permeability to "educational achievement" is in decline. The subtle result is that education can be the route to dominance, but that this pattern is fading in the more recent data.

The most striking contrast is comparison of the degree to which education mediates inheritance. With prestige, the percentage of direct effect of origin that summarizes the net weight of ascription is small and largely stable, rising very slightly to 36.6%. For SEI, it is about equally small and falls fairly sharply, to 31.3%, offering qualified support for claims of declining ascription. But the dominance scales reveal a sharply different picture. As revisions reflecting changes in occupational stratification are allowed full force, ascriptive rank retention net of educational achievement becomes much more prominent, and is fully 63.8% for GSS-SSIC. The contrast with either normative scale, and especially with SEI, is large.

Whether one interprets education as achieved individual merit or as a legitimation of retained advantage, a central component of empirically informed appreciation of the ladder of success has been the centrality of education for reaching the upper ranks. The institutional interpretation holds that this reflection of expanding universalism should increase with time. But the present results reveal the opposite in quite striking measure. Education still matters; it remains more correlated with adult occupational rank than is family background, although the difference is narrowing rapidly. And the pattern of occupational stratification that emerges from the most recent data shows that this meritocratic qualification on ascription is rapidly fading.

Conclusions

The backdrop to this examination of trends in occupational stratification is massive increase in economic inequality. Directly contrary to ideological claims that this was the emergence of an "opportunity society," occupational stratification is by no means decreasing, and there is substantial evidence of increase. While education remains important in adult occupational rank, its importance is in decline. Even more striking, the mediating role of education in occupational stratum reproduction is fading. It is an exaggeration to say that rank begets rank without meritocratic qualification, but much less of one than a generation ago.

These conclusions rest on a conceptual shift from a normative conception of occupational hierarchy that reveals no change or increased fluidity to a measure of occupational dominance or occupational stratification. The case for conceptual clarity, replicability, and interpretability down to the fine print has been outlined above. And the empirical contrast between the approaches is rising. The time-worn criterion of squared intergenerational correlation yields a bright-line summary. For OCGII, the increase in R^2 for SSIC over SEI was 50.1%, or *by half again*. For GSS, it is 99.7%, or fully *two to one*. The large initial gap yawns wider, and the exaggeration of fluidity implicit in using a scale recording inequality in Normative Resources is anything but negligible.

But might not some still conclude that mobility is nevertheless rising, albeit only in terms of some familiar notion of "socioeconomic standing," if not in terms of each and every measurement that might be proposed?

Such views are not very tenable. Duncan's Socio-Economic Index is not a "measure" of social standing, on Duncan's own account, but only an indicator. The notion may be familiar, but its conceptual status is, at best, indefinite. It remains true that the evidence records a modest decline in intergenerational correlation with respect to Normative Resources, or whatever one chooses as concept for this blend of education and economics. However, the inertia, rigidity, or predictability of a son's detailed occupation with respect to his father's detailed occupation is nondecreasing or even increasing. I have put forward the case for calling this occupational stratification or occupational dominance, but whatever one calls it, the empirical fact remains that the apple lands as near the tree as it ever did, if not a little closer. That Normative Resources no longer matter so much is weak solace for the fact that the detailed occupation held by one's father governs access to adult occupational advantage as much as ever, if not a little more.

Notes

1. In formal measurement theory, largely due to psychologists, the required isomorphy is no more than conformity to set theoretical axioms. For physical measurement, in contrast, isomorphy with causally valid laws is the norm. Duncan (1984) explicitly did not draw on formal measurement theory (120-21) but insisted on the absolute necessity

of valid theory. On such a view, measurement requires causally meaningful assignment of numbers, where "cause" requires lawlike statements in the form of mathematical functions. This amounts to the "fine print test" of the text, that differences in value — large, small, or middling — have corresponding numerical implications.

Duncan's critique was directed against the very loose usage common in sociology, where indices, indicators, and, in general, any set of numbers on which one might commit statistics were spoken of as "measures." Yet some would question Duncan's assumption that valid causal law is possible for social life, which would leave empty his ultimate criterion. Even omitting this, the "fine print test" conveys a useful limit on claims to *measure* when only indicators are on offer. Such claims should be disallowed where proponents remain indifferent across the diverse, somewhat different assignments of numerical value. In effect, such indifference amounts to allowing that any specific number is only "sort of around the right value." Such fuzziness fails both set-theory axioms and the precision required for rigorous causality. By ruling out or stigmatizing fuzziness, the "fine print test" synthesizes these concerns. However, in deference to widespread usage, the text will reserve "measure in the strong sense" to refer to the more exacting usage.

2. Capitalization will be employed where terms such as *lawyer* should be interpreted as proper names for exact, specific conceptual or operational definitions; in this case and many others, a Detailed Occupational Code.

3. C. Wright Mills's (1942) biting critique of Warner's seminal Newburyport research should dispel any notion that Warner was aware of, much less influenced by, Weber or any other theorist of modern repute.

4. The need for such invention could be avoided by simply putting SEI aside as being neither a measure in the strong sense, nor a measure in any sense of anything that can be conceptually pinned down. But SEI has played far too great a role for that. While any interpretation that might be offered is certain to dissatisfy some as failing to capture what they, but likely not others, read into this great protean invention, my aim here is only to illustrate how coherent alternatives are imaginable, and, ultimately, for some purposes, probably desirable.

5. Thus one must rule out of any strict interpretation anything like opposite roles, such as education as resource versus earnings as reward. Otherwise, one would be forced by the nature of the equivalence classes of SEI to assert the conceptual equivalence of "requires less resource yet yields more reward " with "requires more resource but yields less reward." Any sensible person would, of course, much prefer the former, although ironically, most readers of this note have implicitly opted for something nearer the latter.

6. A conceptual precedent for adoption of Model II* as an operationalization of hierarchy for the study of mobility may be found in Hout and Hauser's (1992) use of the same model to implement their critique of Erikson and Goldthorpe's (1992) treatment of hierarchy in international mobility comparisons.

7. Whenever occupation is the unit of analysis, reported correlations will be based on weights reflecting frequency in the sample, in this instance, combined relative frequencies over origins plus destinations.

8. Sufficient conditions for convergence, such as equality of marginal variances, are readily formulated, although of course these are counterfactual, since exact convergence does not occur. Less stringent conditions than this illustration are probably possible, since the three methods replicate in producing similar contrasts in marginal variances, but this remains an open topic. It should be noted that said conditions are far looser than the variant on normality mentioned in remarks by Goodman sometimes misread as dictating the convergence of the asymmetric analogs, canonical scaling, and Model II, which, as noted elsewhere, do not converge for either data set considered here.

9. Although Goodman's models were initially proposed for contingency tables, here they play a different role. Model II (elsewhere called the RC model) and Model II* allow one to specify a likelihood function that is a variant of the normal distribution. The likelihood differs by including parameters that incorporate — or, as some would have it, "control for" — relative marginal frequencies. As is commonplace in Maximum Likelihood applications, the normal form of the likelihood is here an assumption, and its adequacy is not directly tested. (To do so would require an attractive alternative form for the likelihood, and broadly speaking, little is more attractive than the normal.) Therefore the fact that the overall 304 by 304 tables are far too sparse to "fit" as contingency tables has no bearing on anything reported here.

The tests reported are contrasts of log-likelihoods drawing on limited degrees of freedom. This is directly comparable to (many) logistic regressions, where one tests (sets of) parameters, and the overall log-likelihood (e.g., of some minimal model) is not a goodness-of-fit measure but simply a baseline for comparison. The location estimates involve (scale-weighted) sums over mobility counterparts (defined in the text below), which by definition have case bases equal to the marginal frequencies of the detailed occupations. By far the greater part of these exceed the minimum five that common lore holds necessary to justify the asymptotic interpretations of differences in likelihood ratios as χ^2. One could delete the size 4 or less, or size 3 or less, or . . ., but since these occupations involve a very small proportion of the total case base, this would have almost no effect on findings or interpretation. The fact, noted in the text, that both overall collections of G^2 statistics for asymmetry graphically display a very close fit to theoretical χ^2 is solid empirical indication that the asymptotic rationale holds to a good approximation for this application.

10. Such empirical results allow closure of potentially cumbersome side issues. First, the asymmetric alternatives of canonical scaling and Model II are not strongly convergent in either sample, nor do they replicate. Accordingly, they diverge from SSIC and have no role in empirically oriented interpretation. Second, notwithstanding statistical rhetoric that "prediction" must correspond with causal order in time, it seems clear to me that stratification is conceptually symmetric in time, and that ancestry or retrospect is no less important than descent or prospect. However, since asymmetry is empirically mooted, no extended discussion is warranted.

11. The sign was reversed for major occupation so that higher values correspond with greater advantage.

12. A parallel demonstration of this patterning for the OCGII data may be found in Rytina (1993). The convergence toward a limit that generates this holds for systematic reasons, but some nuance is involved in formalization. Complete definitions of averaging differ on treatment of marginal means and variances. The figures are based on centering

about each marginal mean. Iterated-marginal-mean-centered averaging can be given an exact analytic treatment by representing it as a matrix product. This may be factored into two fixed ends and a core that is a repeated product of a symmetric matrix. This converges to a constant times the principle eigenvector except for starting vectors (or rankings of occupation in this context) that are exactly orthogonal to a size-scaled variant of the limit. Since every step converges, the first one does, in practice quite markedly. This limit (again size-scaled) is different from SSIC only by factors that disappear under equality of marginal variances (of SSIC) and are nearly negligible in practice. The generalizations implied by the text depend on paths of convergence and could fail to occur under very precise (and hence substantively implausible and improbable) initial conditions. Very rapid, or first step convergence, is both more delicate, as the one partial exception illustrates, and harder to pin down in any very useful formalism. A useful hint may be that one should avoid, or posit, depending on one's leanings, concentrating any massive, distinctive discrepancy on some large occupation.

13. Since the scales in Model II* and the SSIC scale values are each only determined up to an affine transformation, they satisfy the formal conditions defining an interval scale.

14. More or less simultaneously, other relatively frequent occupations take up a similar role, e.g., those with "much farm" in their own counterparts occurring infrequently in mobility counterparts where "little farm" prevails, so that Physicians or Farm Laborers (and many others) echo and extend the pattern. Such parallelism draws on an internal consistency that runs through occupational stratification, such that the proportion Farm Laborers rather closely parallels the proportion Farmers, while both inversely parallel the proportion Physicians, or the proportion Lawyers, even as the two polar opposite pairs engage in frequent exchange with each other. It may be worth noting that any such proportion is logically based on a nominal (present/absent) distinction yet serves to locate the other occupations along a continuum (from 0 to 1.0), with those yielding extreme (and opposite) spectra of values set apart furthest from the center. (Less frequent occupations, which play a commensurately lesser role, yield "less informative" continua, with a predominance of nondiscriminating proportions of zero, even as the narrow range of nonzero values records a location.) But any occupation that is sufficiently numerous provides a spectrum that is a decent tracer of the overall pattern and hence of its own location in it. This intuitively accessible performance by any relatively large occupation recapitulates how nominal distinctions like occupation implicitly record continuous differentiation as soon as relative mobility frequencies are considered. Though it is not generally put this way, the general consistency observable, e.g., between Physicians and Lawyers, or Farm Owners and Farm Laborers, is essentially equivalent to the commonplace that such parallel pairs (and contrasts) reflect equivalence and contrast in an overarching pattern of occupational stratification.

15. I am unaware of any precedent for the measure they used or for their label. An implicit assumption seems to be that the SEI correlation provides a baseline and that taking the ratio somehow "controls" for variation in this baseline. But it is not obvious that any particular inequality scale should give results that closely parallel a predictability or stratification scale. In empirical fact, the parallelism is rather weak.

16. In general, various statistics including percentage changes are based on more significant digits than are reported in the text.

17. With females included, the increase in the GSS is only 9.2%, which illustrates how the use of noncomparable sample definitions can obscure matters.

18. While Hauser and Logan did not provide any specific model, the sort of "method bias" they seemed to fear logically must show up with all samples and hence is refuted by any. Many further falsifying illustrations, using annual samples, may be found in the sequel.

19. Such calculation of subsample sizes assumes that fathers' and sons' residuals are independent for particular occupations, which is the sensible choice since overwhelmingly they are drawn from separate respondents. (Correction for the minor fraction of cases where sons reported identical occupations for their fathers makes a negligible difference.) Independent (and quite different) estimation that is theoretically Maximum Likelihood tends to sustain the point. But any in doubt can easily *over*correct by multiplying all reported z-statistics in this section by $1/\sqrt{2}$ or .707, counting each father or son as one-half of a case. The qualitative pattern is maintained, although necessarily the null hypotheses then take somewhat less of a beating.

20. The display clarifies a key pattern: the greater number of occupations reveal no noteworthy contrast between dominance and normative resource endowment. For these occupations, one could freely interchange SEI for dominance scale values with minimal impact on the overall contrast of scales, or findings. Accordingly, there is limited gain in "information" or "likelihood" that would be attributed to the corresponding "parameter estimates"; such gain is concentrated on a smaller number of occupations and far fewer estimates.

21. Any table of the normal distribution could be used to approximately evaluate probabilities of exchanges across any difference converted to standard measure. A more exact, marginally adjusted summary could be obtained from the Model II* results. While similar calculations could be done for levels of SEI, such results would misstate mobility flows for many of the detailed occupations that populate such levels.

22. The rationale for the specific split will be more clearly apparent in results reported below. Somewhat incidentally, the analysis in Rytina (1992a), first prepared in August 1988, was based on the samples from 1972-86 used in Hout (1988). Hauser and Logan (1992) reported that the 1987-90 samples resulted in lower correlations. Since they didn't entertain the possibility of change, they mistakenly interpreted this as due to method bias, but this is falsified by noting, for example, that the same decrease appears with OCGII-SSIC, but only in the 1987-90 samples.

23. The construction is achieved by decomposing the updating function of the SSIC algorithm into additive components from each annual sample.

References

Blau, Peter M. 1977. *Inequality and Heterogeneity.* Academic Press.

Blau, Peter M., and Otis D. Duncan. 1967. *The American Occupational Structure.* Free Press.

Bound, John, and George Johnson. 1992. "Changes in the Structure of Wages in the 1980's: An Evaluation of Alternative Explanations." *American Economic Review* 82:371-92.

Bourdieu, Pierre. 1984. *Distinction: A Social Critique of the Judgement of Taste.* Harvard University Press.

Crompton, Rosemary. 1993. *Class and Stratification: An Introduction to Current Debates.* Cambridge, Eng.: Polity.

Data Program and Library Service (DPLS). 1983. *Occupational Changes in a Generation, 1973: A User's Guide to the Machine Readable Data File.* University of Wisconsin.

Davis, James A., and Tom Smith. 1990. *NORC General Social Survey 1972-90: Cumulative Codebook.* Roper Center.

DiPrete, Thomas A., and David Grusky. 1990. "Structure and Trend in the Process of Stratification for American Men and Women." *American Journal of Sociology* 96:107-43.

Duncan, Otis Dudley. 1961. "A Socioeconomic Index of all Occupations." Pp 109-38 in *Occupations and Social Status,* edited by Albert J. Reiss. Free Press.

———. 1968. "Social Stratification and Mobility: Problems in the Measurement of Trend." Pp. 675-719 in *Indicators of Social Change: Concepts and Measurement,* edited by Eleanor Bernert Sheldon and Wilbert E. Moore. Russell Sage Foundation.

———. 1984. *Notes on Social Measurement: Historical and Critical.* Russell Sage Foundation.

Duncan, Otis Dudley, and Jay W. Artis. 1951. *Social Stratification in a Pennsylvania Rural Community.* Rural Community Bulletin 543. Pennsylvania State College School of Agriculture.

Edwards, Alba M. 1938. *A Social-Economic Grouping of the Gainful Workers of the United States.* U.S. Government Printing Office.

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

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

Goodman, Leo A. 1979. "Simple Models for the Analysis of Association in Cross-Classifications Having Ordered Categories." *Journal of the American Statistical Association* 74:537-52.

———. 1981. "Association Models and the Bivariate Normal for Contingency Tables with Ordered Categories." *Biometrika* 68:347-55.

Granovetter, Mark, and Charles Tilly. 1988. "Inequality and Labor Processes." Pp. 175-221 in *Handbook of Sociology,* edited by Neil J. Smelser. Sage Publications.

Grusky, David B., and Jesper Sørensen. 1998. Can Class Analysis Be Salvaged?" *American Journal of Sociology* 104:1187-1234.

Hauser, Robert M., and John A. Logan. 1992. "How Not to Measure Intergenerational Occupational Persistence." *American Journal of Sociology* 97:1689-1711.

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

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. 1966. "Occupational Prestige in the U.S. 1925-63." Pp. 322-34 in *Class, Status and Power,* edited by Seymour M. Lipset and Reinhard Bendix. Free Press.

Hout, Michael. 1988. "More Universalism, Less Structural Mobility: The American Occupational Structure in the 1980s." *American Journal of Sociology* 93:1358-1400.

Hout, Michael, and Robert M. Hauser. 1992. "Symmetry and Hierarchy in Social Mobility: A Methodological Analysis of the CASMIN Model of Class Mobility." *European Sociological Review* 8(3):239-66.

Kerr, Clark., John T. Dunlop, Frederick H. Harbison, and Charles A. Myers. 1960. *Industrialism and Industrial Man.* Harvard University Press.

Lenski, Gerhard. [1966] 1984. *Power and Privilege.* University of North Carolina Press.

Levy, Frank, and Richard J. Murnane. 1992. "U.S. Earning Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations." *Journal of Economic Literature* 30:1333-81.

Mills, C. Wright. 1942. "A Review of *The Social Life of a Modern Community.*" *American Sociological Review* 7:263-71.

Parsons, Talcott. 1940. "An Analytical Approach to the Theory of Stratification." *American Journal of Sociology* 45:841-62.

Rytina, Steve. 1992a. "Scaling Intergenerational Continuity: Is Occupational Inheritance Ascriptive after All?" *American Journal of Sociology* 97:1658-88.

———. 1992b. "Response to Hauser and Logan and Grusky and Van Rompaey." *American Journal of Sociology* 97:1729-48.

———. 1993. "Discontinuity in the American Occupational Structure." Unpublished paper, McGill University.

Scott, John. 1996. *Stratification and Power: Structures of Class, Status and Command.* Cambridge, Eng.: Polity Press.

Siegel, Paul M. 1971. "Prestige in the American Occupational Structure." Ph.D. diss., University of Chicago.

Stevens, Gillian, and David Featherman. 1981. "A Revised Socioeconomic Index of Occupational Status." *Social Science Research* 10:364-95.

Suppes, Patrick, and Joseph L. Zinnes. 1963. "Basic Measurement Theory." Pp. 1-77 in *Handbook of Mathematical Psychology,* edited by R. Duncan Luce, Robert R. Bush, and Eugene Galanter. John Wiley.

Treiman, Donald. 1970. "Industrialization and Social Stratification." Pp. 207-34 in *Social Stratification: Research and Theory for the 1970s,* edited by Edward O. Laumann. Bobbs-Merrill.

Turner, Jonathan. 1984. *Societal Stratification.* Columbia University Press.

Warner, W. Lloyd. 1949. *Social Class in America: A Manual of Procedure for the Measurement of Social Status.* Science Research Associates.

Williamson, Jeffrey, and Peter Lindert. 1980. *American Inequality: A Macro-economic History.* Academic Press.