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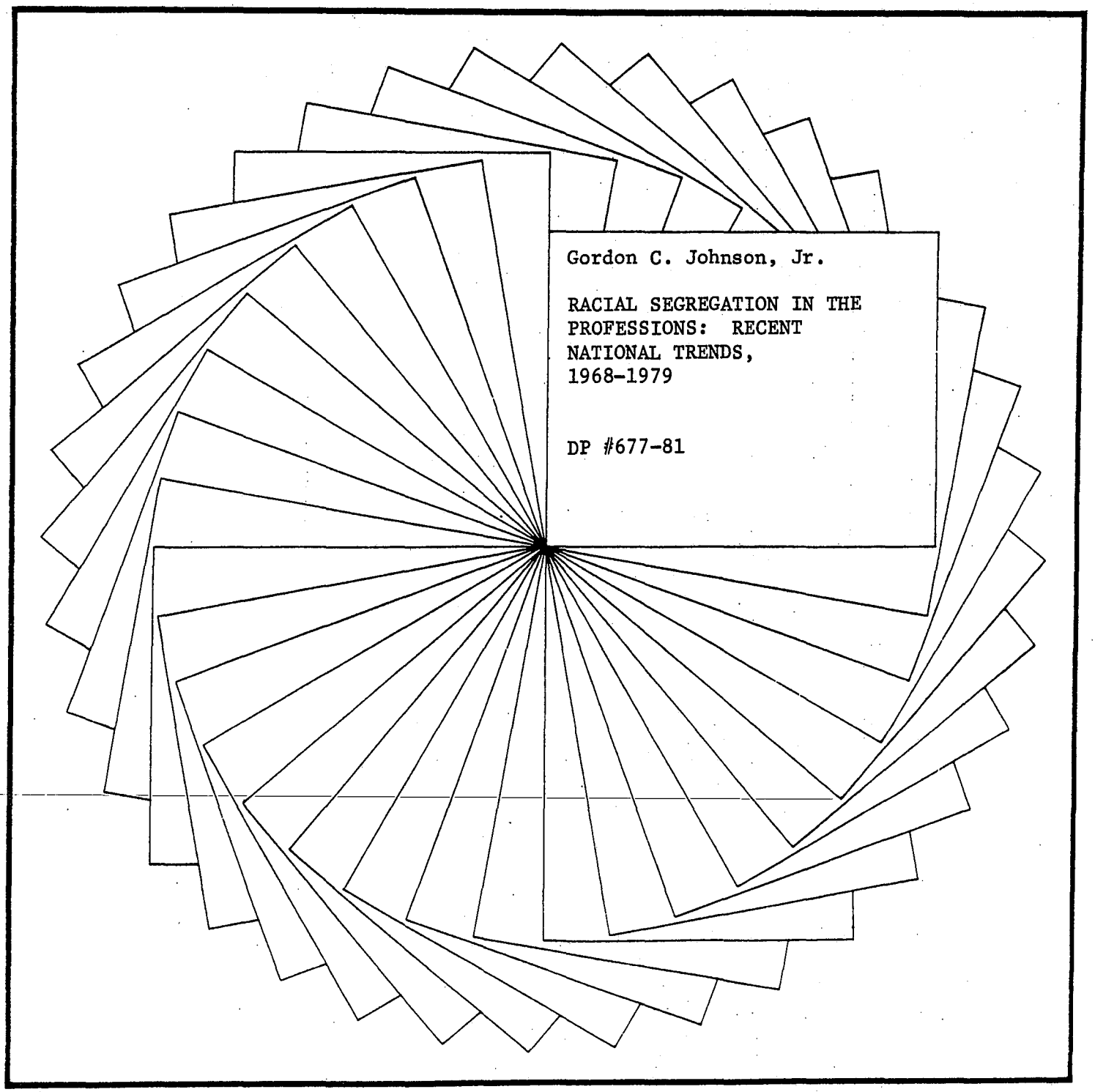

Racial Segregation in the Professions: Recent National Trends, 1968-1979

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November 1981

This research was supported by funds granted to the Institute for Research on Poverty at the University of Wisconsin-Madison by the Department of Health and Human Services pursuant to the Economic Opportunity Act of 1964. The author thanks Barbara Grossman for able research assistance and Louise Cunliffe and Paul Kostrow for computer programming assistance. A preliminary version was presented at the Annual Meetings of the Southwestern Social Science Association, Dallas, Texas, March 26-28, 1981; and at the Center for Demography and Ecology, University of Wisconsin-Madison.

ABSTRACT

This paper focuses upon recent annual national trends in racial segregation in professional occupations which are based on Current Population Survey (microdata) occupation- and industry-specific distributions of employed black and white professionals for 1968-1979. Annual changes in the patterns of these trends are descriptively analyzed with the objective of exposing their implications to construct a dynamic (cross-time) explanatory model able to evaluate macro-covariates of racial segregation in professional occupations. The results of the analysis suggest there is a need to refine and further develop the popular explanations of occupational race-segregation.

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1. INTRODUCTION

The development and analysis of macro-level trends in occupational racial segregation has long been an important part of social science research. As can be argued for much social indicator research, however, those who have attempted to conceptualize and measure these trends often do not further analyze their indicators as components of larger, dynamic (macro-level) social system models. Thus, though there are national data on year-to-year change in occupational racial segregation, there exists no study of how such annual changes covary with important shifts in the rate or nature of employment, or with other macro-level socioeconomic conditions.

To contribute to this research need, this paper studies temporal attributes and changes in racial segregation within those professional occupations for which adequate annual time-series data are available. Specifically, it (1) briefly reviews the record provided by past studies for total labor force patterns, and (2) examines patterns of annual change in indexes of professional racial segregation from 1968 to 1979.

2. TRENDS IN RACIAL DIFFERENTIATION: THE UNITED STATES LABOR FORCE

Changes in the United States Labor Force

Several labor force scholars have observed that over the last hundred years, many important social, demographic, and economic alterations have transformed numerous attributes of the American labor force, including

those that bear upon the distribution of the races within the professions. For example, Wilson (1978) shows that although there were successes that did not last, "The period 1870-1890 in many respects was a golden age" for black-white labor force relations, and referring to the same period Marrett notes (1980:16) that "exceptional black people succeeded in business and the professions and were hailed by both blacks and whites for their achievements." But only subsequently, specifically after World War II, and particularly after 1960, did changes in the allocation of workers to industries and different types of work (including the well-known continuous shift from farm-related to manufacturing and service jobs) lead to the expansion of white-collar employment for all races.[1] This, along with the enactment of civil rights legislation, eventually obliterated race as a mark of oppression for substantial numbers of upwardly mobile blacks.

Previous Studies of Racial Differentiation

Without rigorous longitudinal empirical evidence, only speculative judgements can be made about the potential influences of macro-level socioeconomic labor force changes on trends in racial segregation. Previous cross-time investigations of black-white occupational patterns (e.g., Broom and Glenn, 1965; Hiestand, 1964; Price, 1969; Wilson, 1978) and of occupational racial differentiation (ORD) in the United States (e.g., Bahr and Gibbs, 1967; Brown, 1971; Gibbs, 1965; and Martin and Poston, 1972) were not cast as explicit, dynamic (explanatory) social system models. (Table 1 displays the characteristics of the ORD studies.) Correlatively, our brief overview of these and other previous cross-sectional studies of occupational differentiation (see, e.g.,

Table 1

Characteristics of Major United States Studies of Occupation Racial Differentiation

Author(s)	Date	Universe	Sample Size and Analysis Units	Data	Measure(s)[a]	Descriptive Statistics and Measures of Variation			
						MIN	MAX	SD	$\bar{X}$
Gibbs, J.	1965	States	50 States	11 "Major" occupation categories (U.S. Bureau of the Census, 1962, Table 122)	CRD (SRD)	21.8 (Maine)	62.4 (Wyoming)		41.0 (National Mean) 45.5 (South) 39.9 (Non-South)
Bahr, H. & J. Gibbs	1967	"Communities" (66 SMSAs) 250,000+ and 25,000+ nonwhites	33 SMSAs selected randomly from universe which was rank-ordered and paired according to degree of income differentiation	160 "detailed" occupation categories (male specific) (U.S. Bureau of the Census, 1962, Table 122)	CRD	36.8	67.05		51.5 [Median = 40.69]
Brown, B.	1971	Metropolises	101 SMSAs 250,000+	41 "derived" occupation categories created from "detailed" 1960 Census data (U.S. Bureau of the Census, 1962, Table 122)	CRD W/N WM/NM WF/NF (SRD_1) (SRD_2)	29.8 31.6 24.7	64.6 63.7 74.6	7.9 7.0 9.9	48.0 56.2 55.3
Martin, W. & D. Poston, Jr.	1972	Metropolises	66 SMSAs (of the contiguous states)	11 "major" 1960 Census occupations (for race groups and all ages) (U.S. Bureau of the Census, 1962, Table 123)	CRD F WF/NM	.319 .439	.707 .735	.109 .076	.512 (all ages) .583 (all ages)

[a]The terms in parentheses indicate standardized variants of racial indices

CRD = Crude Measure of Racial Differentiation (black-white occupational dissimilarity)

SRD = Standardized Measure of Racial Differentiation

W/N = Whites-Negroes

WM/MN = White males-Negro males

WF/NM = White females-Negro males

WF/NF = White females-Negro females

F = Females (only)

Johnson, 1980a) points out that these prior studies neither systematically identify, nor empirically assay, many substantive sociostructural correlates of race-segregation change.[2] However, available studies well specify the "point-in-time" magnitude of occupational racial differentiation. And their findings differ, depending on the nature of the occupational information, the study universe, or the applicable subpopulation groups (see, e.g., Figure 1).

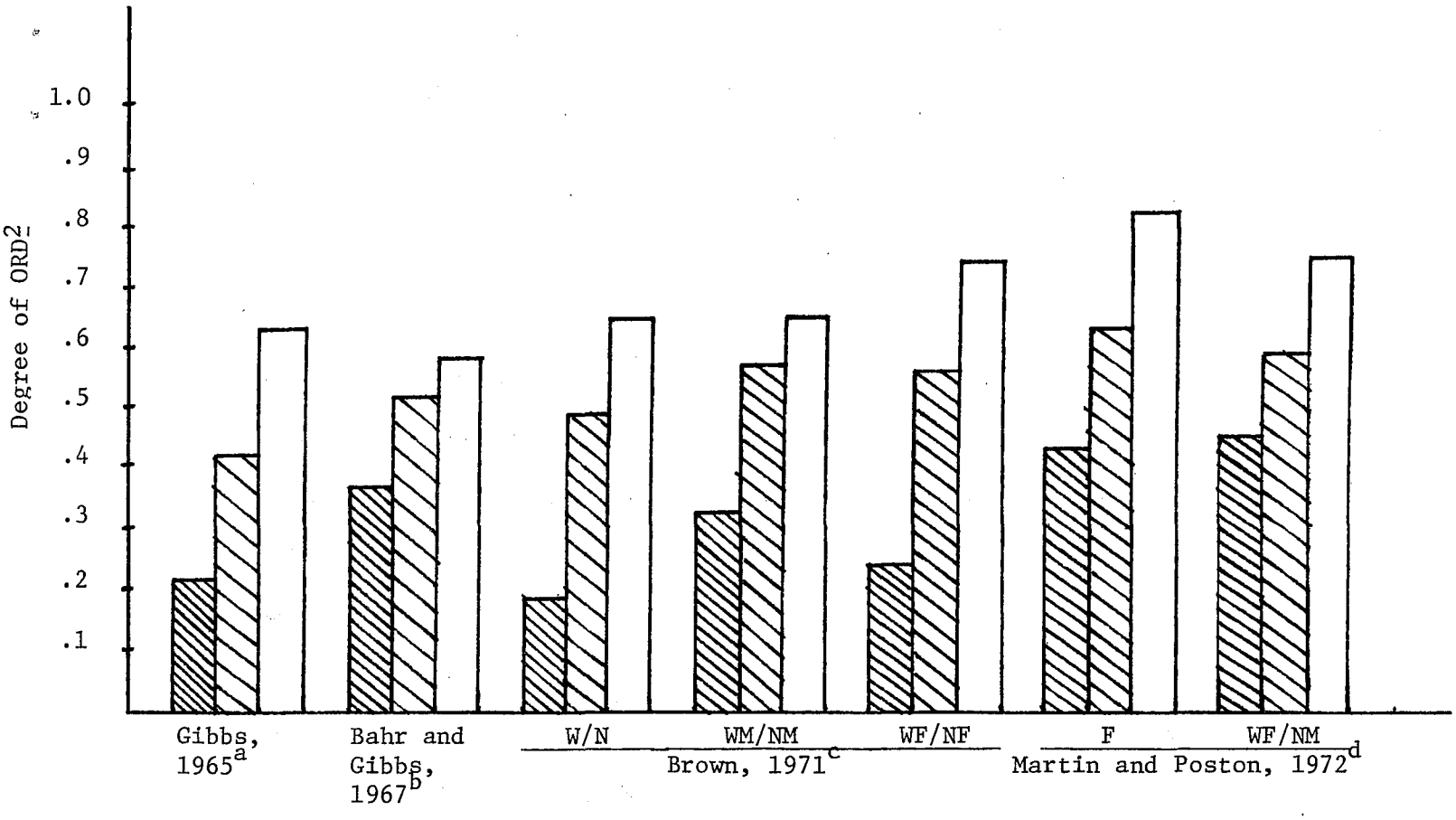
Occupation-Specific Trends in Racial Differentiation

Previous analyses of trends in occupational racial differentiation at the national or subnational level in the United States have focused, in the main, on the total labor force, ignoring detailed patterns of racial change within specific occupation groups. Moreover, there appears to be no study that (1) explicitly focuses on national trends in racial segregation that are based on a functional labor force subset of the many strikingly different occupation classes that constitute the total U.S. work force; or (2) centers upon race-segregation trends for any major occupational subgroup within important subsocietal units, such as metropolitan areas. Thus the effects of broad changes in important social and economic phenomena upon occupation-specific trends remain almost as unknown as their effects upon general racial--or sexual--segregation in the labor force as a whole.[3]

In this research, to initiate the study of trends in racial differentiation for specific "major" occupation groups, some of the conceptual and methodological strategies of macrodynamic analysis are applied to professional occupations.[4] These procedures, we believe, represent a proper departure point for clarifying the interconnectedness of racial

Figure 1

Crude Indexes of Occupational Racial Differentiation
in the U.S. Labor Force, 1960



Minimum

Mean

Maximum

[a] 50 states (m)

[b] 33 SMSAs (d)

[c] 101 SMSAs (dr)

[d] 66 SMSAs (m)

Note: For definitions of abbreviations, see Table 1.

and sexual differentiation with other socioeconomic factors, with no loss of potential to explain change in racial differentiation. Thus, though one may discern from previous studies, that, along with accelerating increases in the labor force participation of minorities and particularly of women, occupational differentiation by race has probably decreased over time, there remains a lack of comprehensive knowledge about: (1) the occupation-specific cross-time patterns of race-segregation for all types of broad occupation groups at the societal level, and for several intra-societal social units; (2) the structural characteristics of those occupations that have undergone change in racial differentiation; and (3) the general social circumstances that condition or reflect variations in the levels of racial differentiation within specific occupation groups.

A comprehensive, formal attempt to identify the myriad causes of changes in race-segregation lies beyond the scope of this research, which endeavors only to describe and illustrate the time-series patterns in levels of race-segregation for one specific set of occupations--the professions.[5] Prior to elaborating those findings, in the next section I shall briefly discuss the data sources, methods of measurement, and the procedures of analysis used in formulating the research design that underlies these preliminary descriptive results.

3. RESEARCH DESIGN

The Data

In recognition of the merits of the Current Population Survey (CPS) microdata for studying year-to-year changes,[6] the annual national measures to be presented here derive from analyses of CPS (March

Supplement) tabulations of the occupation- and industry-specific distributions of employed black and white professionals for 1968-1979.[7]

Although adequate for the main purpose here, the unaggregated, 1-in-1400 CPS sample tabulations limit the potential for precise subnational analyses.[8] Also--because the CPS installed in 1972 the new 1970 Census occupation classification system--the measures from these data for the years that correspond to the time-frame of our interest undergo a "break-in-series." This, of course, forces confrontation of the issues of discontinuities in the classification of occupations (see below). Nonetheless these CPS tabulations are the data with which we now must work; they represent the only available, comprehensive, national, and annual information source of the occupations of professional workers and the industries of professional work (U.S. Bureau of the Census, 1977b: 1).

Because of the continuous reallocation of the labor force among industries, I sought first to explore implications of industrial affiliation for professional race-segregation and for changes in that segregation.[9] Thus, as a heuristic for partitioning the CPS data, a set of six relatively homogeneous, industry-specific, professional racial profiles were developed to control the type of place where professionals work by allocating all of the detailed 3-digit CPS industry categories (including most of those industries labelled "allocated" or "not specified": n = 149 for 1969, n = 227 for 1970-1979) to the Browning and Singelmann (1975) 37-industry, six-sector allocation scheme[10] (see also Appendix A). This, of course, sundered the data underlying the annual racial profiles (comprising the total U.S. professional labor force--TPLF) into six sector-specific racial profiles.

The Measurement of PRD Change

The measures. For this research, two distinct annual series made up of indexes of Professional Racial Differentiation, or PRD (often called delta indices, see, e.g., Farley, n.d.: 5; also Kirby et al., 1973, Chapter 12) were computed for the total U.S. professional labor force (see Table 2), and three annual series were prepared for professional workers within five of the six industry subgroups.[11] Frequently used to assess a variety of types of social differentiation, these delta indexes vary independently of the racial composition of the professional labor force. One of the annual national series, and one of each of the industry-specific series, is based on the familiar and widely used unstandardized index of dissimilarity (URD) (see Duncan and Duncan, 1955; Taeuber and Taeuber, 1976; also Kestenbaum, 1980). This index provides a crude though adequate and easily interpreted summary of the differences in the occupational locations of black and white professionals. As its integration standard, the basic dissimilarity index takes the racial composition of the entire professional labor force so that, if every occupation has the same racial composition as the professional labor force generally, the value of the basic delta index is zero. Non-zero values of the basic dissimilarity index specify the proportion of either the black or white professionals who would have to switch from the occupations they currently hold to other occupations to bring about the condition of no racial inequality in professional occupational distribution. However, given variation in the number (N_c) and relative size (c_i) of occupations employed in its calculation, URD is often unstable.[12] Thus when using URD for cross-sectional or longitudinal comparisons such as

Table 2

Indexes of Professional Racial Differentiation for the Total U.S. Professional Labor Force and for Industry Sectors, 1968-1979

Year	Index	Total Professional Labor Force	Transformative Sector	Distributive Sector	Producer Sector	Social Service Sector	Personal Service Sector
1968	URD	.332	.366	.622	.642	.215	.409
	ARD	.591	.730	.899	.896	.657	.764
	RRD	--	.588	.850	.810	.328	.864
1969	URD	.329	.388	.705	.614	.274	.547
	ARD	.575	.759	.878	.908	.625	.821
	RRD	--	.587	.745	.855	.341	.698
1970	URD	.322	.393	.672	.485	.235	.547
	ARD	.522	.746	.847	.867	.652	.782
	RRD	--	.666	.861	.749	.332	.911
1971	URD	.368	.455	.745	.509	.240	.653
	ARD	.625	.759	.920	.922	.654	.758
	RRD	--	.609	.894	.876	.386	.670
1972	URD	.362	.578	.669	.549	.232	.408
	ARD	.594	.786	.892	.863	.621	.781
	RRD	--	.691	.781	.738	.331	.912
1973	URD	.330	.472	.627	.518	.225	.372
	ARD	.576	.724	.875	.839	.641	.737
	RRD	--	.594	.839	.701	.325	.916
1974	URD	.352	.498	.697	.551	.285	.422
	ARD	.578	.751	.886	.833	.637	.767
	RRD	--	.627	.868	.715	.365	.889
1975	URD	.335	.426	.675	.490	.281	.541
	ARD	.584	.695	.829	.874	.640	.861
	RRD	--	.561	.801	.701	.392	.909
1976	URD	.355	.433	.980	.480	.300	.686
	ARD	.655	.762	.965	.886	.720	.851
	RRD	--	.628	.973	.670	.426	.864
1977	URD	.334	.466	.783	.463	.245	.560
	ARD	.605	.690	.889	.807	.639	.812
	RRD	--	.570	.882	.648	.335	.744
1978	URD	.292	.338	.545	.506	.256	.612
	ARD	.570	.690	.842	.788	.644	.891
	RRD	--	.615	.714	.678	.353	.943
1979	URD	.272	.210	.487	.367	.264	.385
	ARD	.513	.613	.836	.729	.592	.716
	RRD	--	.513	.773	.606	.327	.732

Source: Current Population Survey, March Supplements. URD = unstandardized index of dissimilarity; ARD = absolute standardized delta; RRD = realistically standardized delta. These indexes are explained in the text.

those that are invited by this research, there is a need to control, respectively, for cross-industry, or simultaneous cross-time and cross-industry, differences in occupational structure.

So a second set of national and industry-specific series based on another index--absolute standardized delta (ARD)--was also computed. This index eliminates size (c_i) differences among the professional occupation categories, by assigning an equal number of persons to each occupation (c_i = 1000) while retaining the compositional ratios that obtain in the original Census data. The differentiation index then is derived from the resultant "directly standardized" rate differences.[13] ARD subsequently also is independent of interindustry variations in the size (c_i) and number (N_c) of occupation categories.

Although elimination of the effects of occupational structure provides a valid measure of PRD, the interpretation of ARD is not so direct as that of URD and may be misleading. An alternative to controlling structural differences by eliminating size differences in occupations is to use simple compositional averages based on an assessment of the <u>average</u> size (c_i) of each occupation where all of the analysis units that will be compared are included in the computation. Such a procedure guards against over- or underadjusting the impact of each occupation while obtaining a comparable race-segregation measure. This method also provides a "realistic" interpretation (see, e.g., Johnson, 1980b: 19-21). Thus, although ARD is a defensible standardized PRD measure, for each industry sector we constructed a third series of PRD measures composed of realistically standardized PRD indexes (RRD).[14]

<u>Measuring longitudinal PRD change</u>. In longitudinal analysis contexts, it is often argued that strict index comparability depends upon

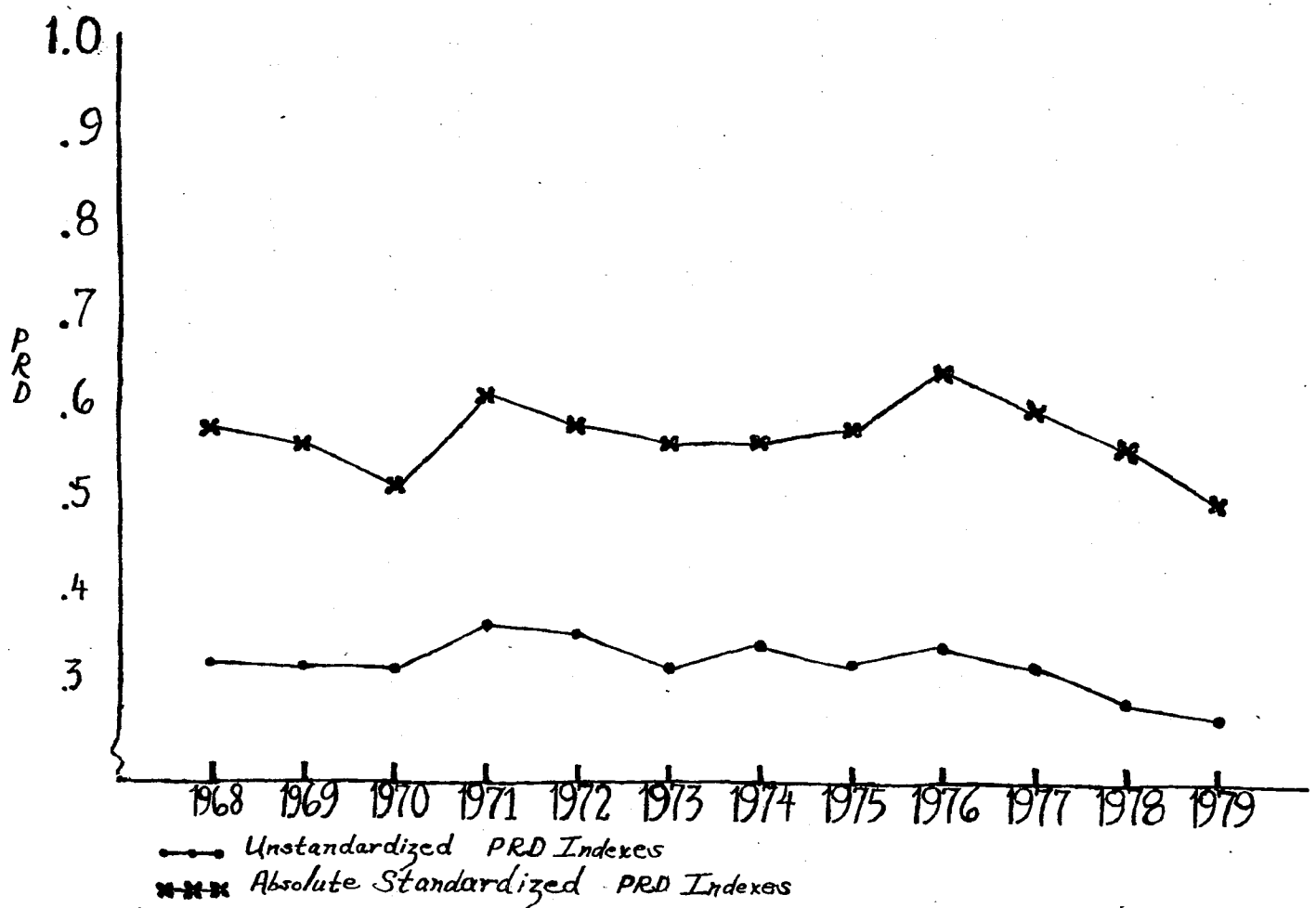


FIGURE 2: Annual Indexes of PRD - The U.S. Professional Labor Force, 1968-1979

refined measurement techniques, and also upon the availability of high-quality representative data that, ideally, are or can be made continuous over the time-frame of the analysis. Continuity within classifications, however, is not a sufficient condition for accurate diachronic comparative measurement; nor, in truth, is it even necessary.

The most accurate (valid) measures of PRD will always be those obtained at or near the level of specific jobs, considering each as a unit, regardless of how they are described or labeled (i.e., classified) and despite unobservable cross-time variations in occupational activity and job titles. Such measures reflect actual levels of differentiation (see Williams, 1979: 81). This is a definitive maxim or essential epistemic correlation.

The underlying issue here is that when occupational data are temporally standardized, the same data characteristics that are matched or adjusted for longitudinal comparability may also simultaneously seriously reduce the face validity and the subsequent precision of measures derived from the adjusted data.[15] Uncritically identifying occupations by title or other brief class description as "common," "constant," or "comparable" over a 60- or 70-year span, for example, may prove to generate nothing more than a chronologically ordered series of mensuration illusions.[16]

4. TRENDS IN PROFESSIONAL RACIAL DIFFERENTIATION

Introduction

In Figure 2, two annual PRD index-series, derived by plotting the 1968-1979 URD and ARD dissimilarity values of the total U.S. professional labor force (Table 2, col. 1), reveal near-parallel trends. Note that in

each year the ARD index levels remain at more than twice the magnitude of the URD indexes. It is also interesting that both series index a smaller amount of race-based professional occupational differentiation in 1979 than in any year since 1968. The net reduction in the extent of PRD during the same term, however, has been slight, and both series suggest that relatively steep increases in PRD took place in 1971; then, after a four-year level period, an increase (particularly according to the ARD series) occurred again in 1976. PRD, however, has descended progressively since then to 1979.

Since these trend analyses are preliminary to the development of a formal, macrodynamic, time-series analysis, at this juncture I shall not explore in detail the potential explanations of PRD. We will begin to focus upon the explanatory issue, however, by asking just what socioeconomic factors (taken from acceptable explanatory statements) may best explain the temporal fluctuations in the PRD series? Since causal factors attuned to specific rather than general phenomenon are more easily identified, it is plausible (see, e.g., Land and McMillen, 1980: 6) that causes of PRD for unit rather than general areal or industry-wide contexts may also be more easily identified.[17] Thus it seems wise first to partition the TPLF data of Figure 2--for example, by employment context (i.e., by industry)--before attempting to identify the macrosocioeconomic influences interrelated with race-segregation trends. As noted earlier, for this purpose, the Browning-Singelmann classification scheme, which yielded five useful major categories, was used.

Industry-Specific PRD Trends

In Figures 3a-3e, three (URD, ARD, RRD) annual measurement series for PRD are illustrated for five major (Transformative, Distributive, Producer, Social Services, and Personal Services) Browning-Singelmann industry segments.[18] Each series may be thought of as a geometric expression of a conjoint industry- and occupation-specific tabulation of race-ordered distributions of professional workers.

Before we examine the trends for the major industry categories, it should be recalled that the 1972 CPS installation of the 1970 Census occupation-classification scheme interrupted the continuity of the professional classifications used. These "breaks-in-series" occur between the 1971 and the 1972 data points. The respective 1960 84-occupation and 1970 121-occupation Census professional classifications differ in that the 1970 scheme contains about 44 percent more detailed occupations. Also, the two classification systems are distinct in some intrinsic aspects. Both groups of occupation titles are, however, roughly equivalent reflections of actual professions, and their parallel dissimilarity statistics should lead to a reasonably comparable gauge of PRD.[19]

Figure 3a shows the trend of PRD for 1968-1979 within the Transformative industry sector. The unstandardized PRD index levels accelerate upward from 1968 to 1972, before falling about 10 percentage points in 1973 to a level which persists essentially to 1977. The URD series then begins an acute two-year decline, almost 20 percent, to a low point in 1979, when fewer than 27 percent of the white (or black) professionals working in transformative industries would have to change jobs for the condition of no racial inequality to exist in the Transformative

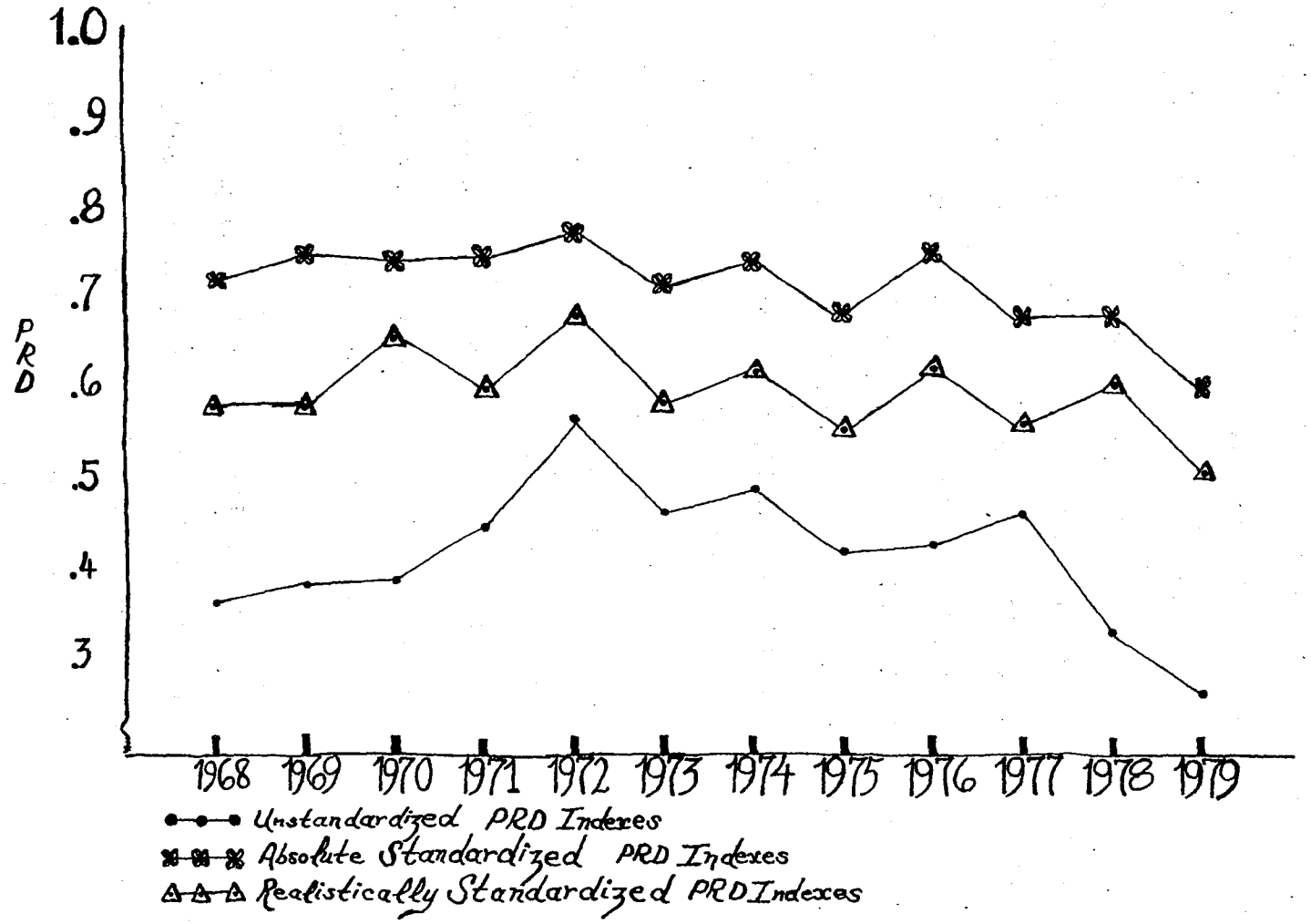


FIGURE 3: Annual Indexes of PRD - The Transformative Industry Sector 1968-1979

sector. This series subsequently contrasts with both TPLF-URD and TPLF-ARD PRD trends; the trend turning points in 1972 and 1977 occur a year later than those exposed for the TPLF, and as one might expect, the finer-tuned, industry-specific index values appear to be far more sensitive to year-to-year change. Although the ARD series is consistently greater in magnitude than the RRD index series, like the URD series both of these standardized series suggest an overall drop in the magnitude of Transformative sector PRD. But each of these standardized series by 1971 demonstrates puzzling oscillations that reflect periodicities evident neither in the TPLF trends nor the URD-PRD trends.

When compared with the TPLF or Transformative sector trends, the Distributive PRD trends (Figure 3b) offer intriguingly different patterns. They are substantially greater than the comparable Transformative sector measures, and in the course of ascending and falling the trends criss-cross (more generally in harmony with the TPLF trend than with the Transformative sector pattern). On balance, the standardized trends suggest less overall change from 1968-1979 than the unstandardized delta-index trend. This suggests that the Distributive sector may have experienced radical periodic increases--and decreases--in PRD immediately preceding the 1979 low.

Though few interindex parallels appear in their patterns, the Producer sector index series (Figure 3c) suggest that within the Producer sector also an overall decrease in PRD has occurred. But the index values for this sector also display a unique complex of trends. Except for the tandem periodicities of the two standardized series up to 1972 (a pattern not displayed by the URD series), the trends are almost more slight upswings than steady downturns. Note that for every series of

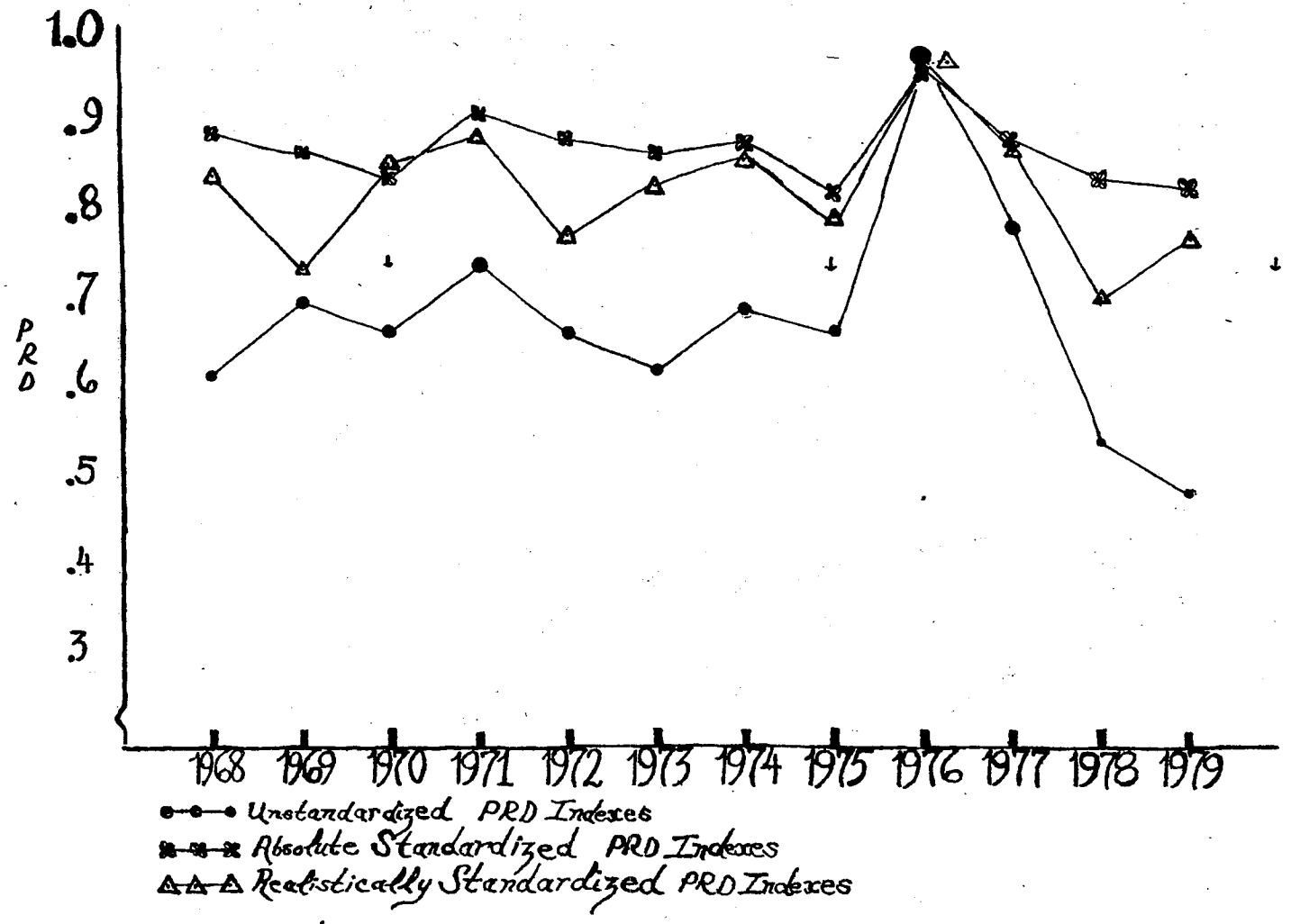


FIGURE 3:[b] Annual Indexes of PRD – The Distributive Industry Sector

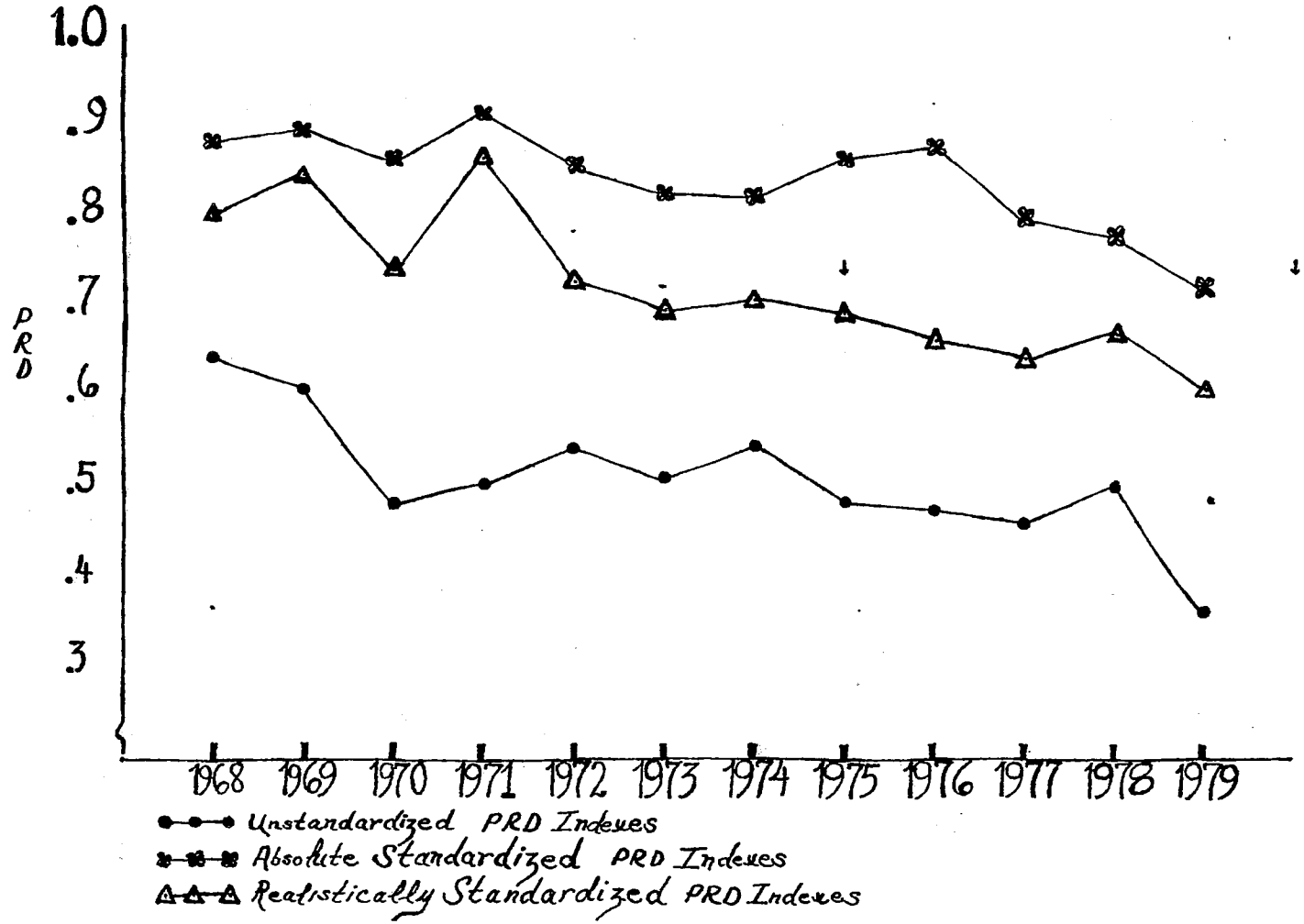


FIGURE 3: C Annual Indexes of PRD - The Producer Industry Sector 1968-1979

this sector to record the overall net decrease that is in evidence, a substantially lower degree of PRD occurred most recently, that is, in 1979.

Turning to the Social Service PRD trends (Figure 3d), one can observe foremost that (1) the URD and RRD series are comparatively low in magnitude; however, (2) the variance between the unstandardized and the ARD index values is sizeable, and (3) the trends do not exhibit the patterned general decreases of the TPLF and the other industry sector trends.

Finally, like the Distributive sector trends, the Personal Services industry trends (Figure 3e) display mixed large-scale, short-term changes and cross-cutting tendencies which depict an unanticipated volatility in compositional change. Also these series show highly varied differentials between the URD values (on the low end) and both of the standardized series values. Apparently, as noted in the earlier analysis of professional sex-segregation, the professional workers who are employed in Personal Service activities are likely to be concentrated in relatively small occupations that adjust upwards in weight when standardized by the ARD or the RRD indexes. But note that the levels of the annual RRD indexes most often exceed the values of the ARD indexes. This implies that when the dissimilarity indexes are weighted in terms of the "actual" occupation structure of the total U.S. professional labor force, rather than adjusted to be of equal size, the dissimilarity calculations frequently unmask considerably more segregation.[20]

In summary: (1) In 1971, the year before the CPS initiated use of the 1970 classification scheme, we can show by cataloging all possible types of cross-time changes in PRD that noteworthy decreases (unexpected changes relative to TPLF patterns) occurred in the Transformative and

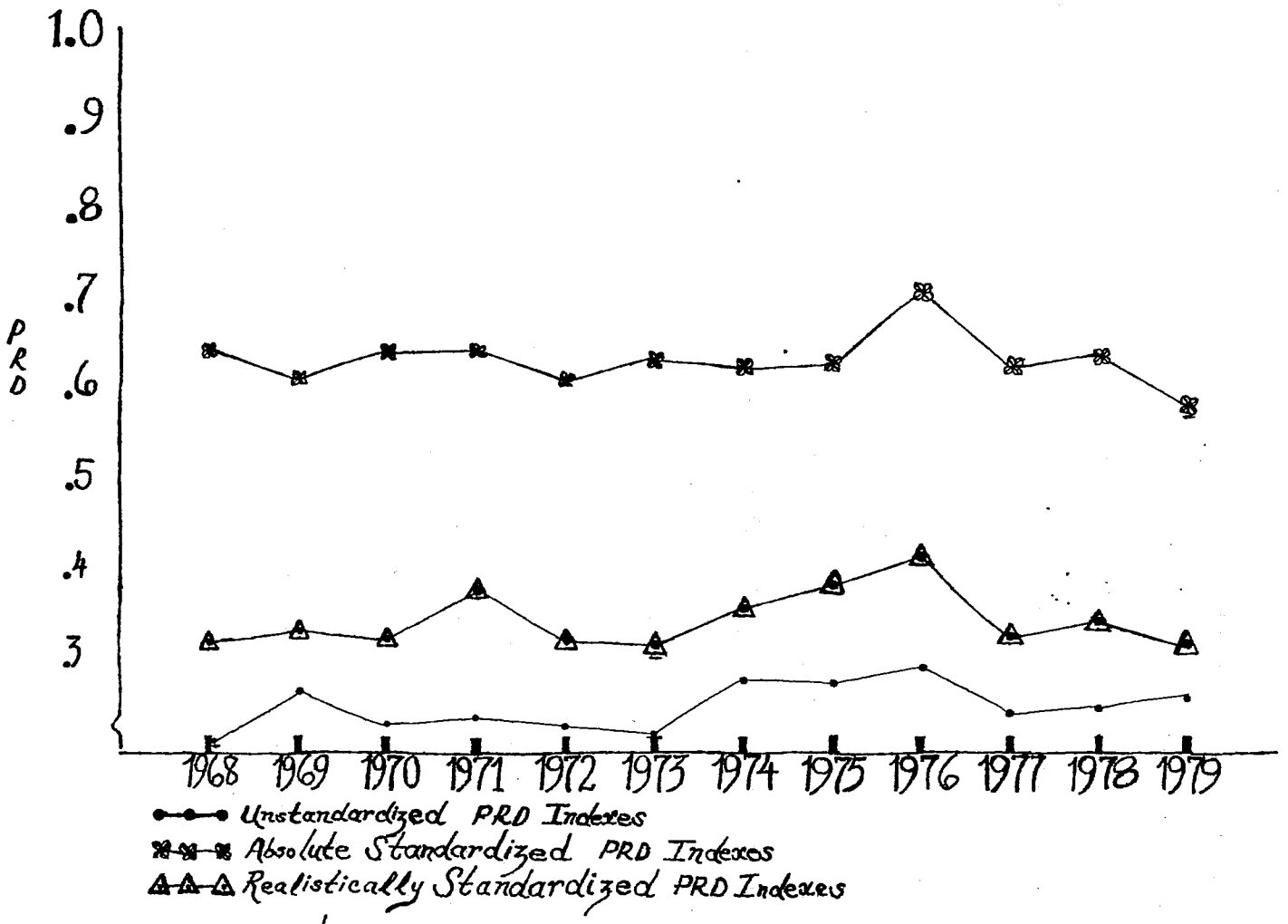


FIGURE 3: d Annual Indexes of PRD – The Social Service Industry Sector 1968-1979

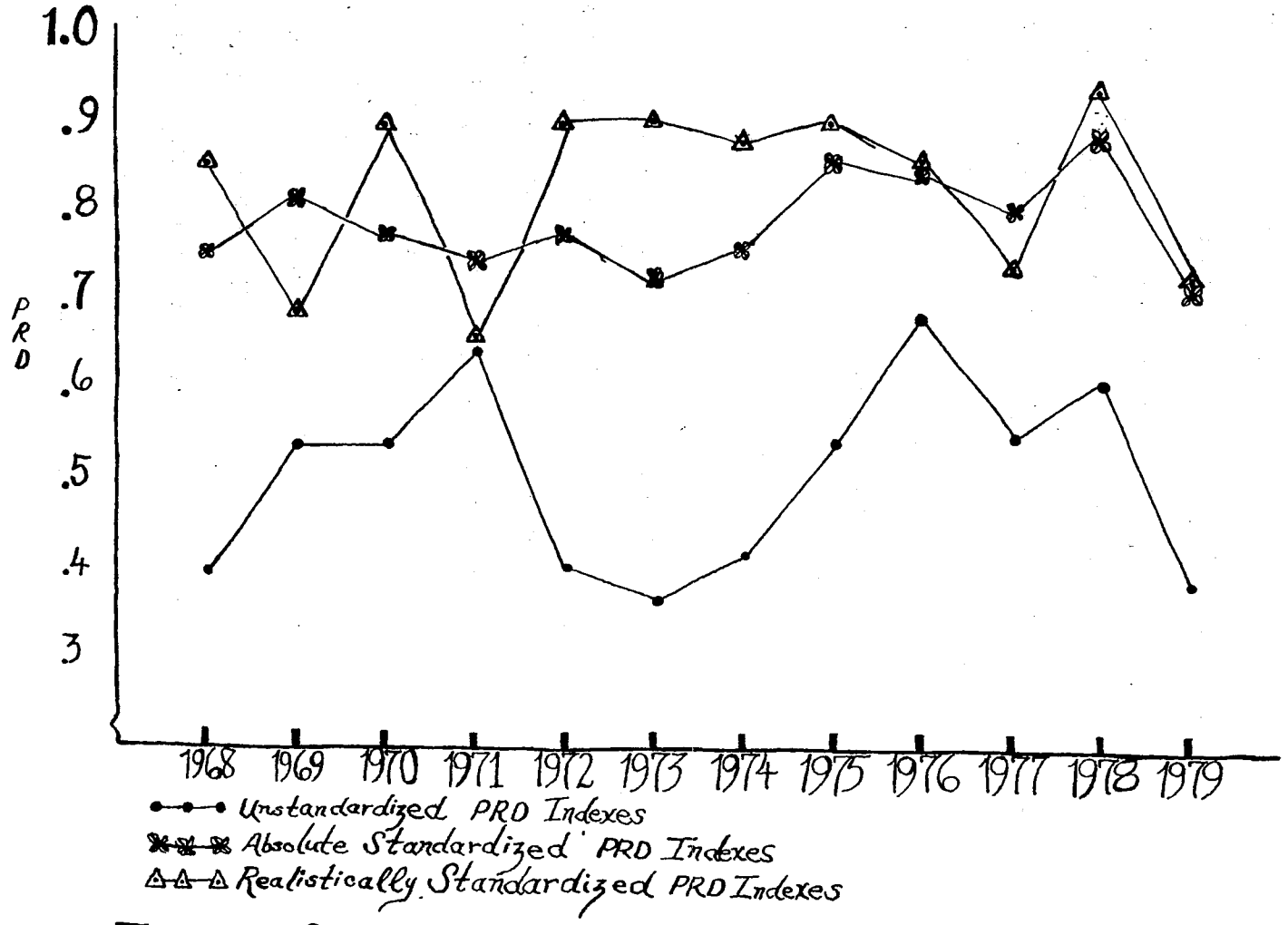


FIGURE 3: Annual Indexes of PRD – The Personal Service Industry Sector 1968-1979

Personal Services industries. Also evident are a variety of (2) industry-specific series change differentials (i.e., differentiation change at variance, in magnitude, with concurrent changes in TPLF racial differentiation, rather than changes that are unexpected in a logical sense) and (3) series change rate differences, and trend changes that are defined by (4) simple (i.e., URD-ARD or URD-RRD) but sizeable unstandardized-standardized race-segregation differentials (see, e.g., the Social Services and Personal Services sectors, Figures 3d and 3e), and (5) trend changes evidencing periodicities (e.g., the ARD and RRD Transformative sector series, Figure 3a).

5. DISCUSSION

Despite the fact that some industry-specific trends show little or no change, the data presented in the preceding descriptive analysis unmistakably suggests generally decreasing racial differentiation in professional occupations. Moreover, the professional occupation race-segregation trends display many noticeable similarities as well as differences across industry categories. The similarities, however, are not at all the same for all of the different industrial contexts of professional work. These patterns imply that (1) individual causative factors such as prejudice or discrimination are not <u>alone</u> likely to explain professional racial differentiation; and, (2) a variety of macro-level correlates doubtless exist. The uncommon inter-industry oscillations of the professional race-segregation trends also call into question the wisdom of the widely-held assumption that <u>differentiation</u> measures based on broad occupation categories will provide results simi-

lar to those based on specific "detailed" occupations, since many "detailed" occupations are aligned mainly with one or only a few industries.

The finding, contrary to common belief, that year-to-year trends in race- and industry-specific professional occupational allocations are likely to be less related to variations in the prevalence of prejudice and discrimination in the United States derives, of course, from obvious countervailing increases and decreases in professional racial differentiation across industry contexts. This observation extends the applicable scope of the implications of findings of earlier subnational ecological studies. For example, variation in measures of the total labor force occupational differentiation of blacks and whites for each of the 50 states also could not easily be interpreted by Gibbs (1965) in terms of common beliefs about the prevalence of prejudice from one state to the next. These complementary results together cast doubt, not on the accuracy of Census data and dissimilarity measures of differentiation, but on the adequacy of <u>beliefs</u> about the extent of the influence of prejudice and discrimination on occupational differentiation. The empirical relation between occupational racial differentiation and prejudice and discrimination clearly is not what it is often assumed, and thus expressed, to be.

These challenging empirical results can best be entertained, cumulatively, as a series of signals of a need and a direction for future research. Thus, in light of our findings, we ask: Is it possible that professional occupational racial differentiation is more a consequence of ecological and demographic influences (due, e.g., to subpopulation differentials in degree of urbanization or concentration, birth place, or

recency of geographical mobility) rather than social-psychological or psychological attributes of individuals such as prejudice and discrimination? To begin to answer this question, subsequent studies perhaps should endeavor to identify pertinent ecological and demographic characteristics which significantly differentiate the white and black subpopulations and, simultaneously, are systematically arrayed with patterns of professional occupational racial differentiation (see, in particular the statements of Gibbs, 1965:165, also those of Martin and Poston, 1972:354); then seek to establish the relative influences of these variables while keeping in mind that, as Gibbs put it, "some (may) operate with and others independently of prejudice and discrimination." Perhaps, then, if, as Taeuber (1967) urged, the labor force structure is viewed as a lattice of detailed occupations and industries, then access, egress, and movement across thousands of varied conduits of race-based mobility can be perceived and fruitfully analyzed with reference to relevant subpopulation attributes. This approach conceivably may lead to a far better understanding of the underlying determinants and actual consequences of the patterns of professional occupational differentiation described above.

However, because ecological and demographic subpopulation factors vociferously interact with a broad range of macro-level social phenomena--apart from the invidious social-psychological and psychological mechanisms of prejudice and discrimination--future exploratory designs that address identification of macro-level influences on professional racial differentiation should probably precede attempts to establish the relevance of those variates that differentiate the subject subpopulations. Future designs, moreover, probably should be cast in

long-term, longitudinal, interdisciplinary perspective to encourage a formal accounting of the effects of both long- and short-term changes in broad-scale economic conditions, changes in relevant federal laws (e.g., alterations in the scope of equal employment opportunity laws), and changes intrinsic to the professional occupations such as intra-occupational organizational changes which are geared to enhance the participation of blacks or other minorities. Combining these considerations with a concern for changes in racial differentiation brought about by important changes in subpopulation ecological and demographic differentials and changes in varying industrial contexts will likely aid the development of a formal macrodynamic explanation of professional racial differentiation.

To guide effective programs of planned amelioration for racial differentiation in the professions, from knowledge of past trends and changes in occupational racial differentiation, hypotheses of future change in racial differentiation must be formulated. To do this, however, social scientists first must abandon conventional oversimplified explanations of racial differentiation; precise macrodynamic explanation must be entertained. To what extent the foregoing descriptive analyses and suggestions for additional research can contribute to these objectives is, of course, not yet known, but we believe the results invite further investigation.

NOTES

[1]In response to the alterations between 1960 and 1970 in the American industrial structure, four of eleven broad occupational categories (professionals, semi-professionals, clerical workers and service workers) increased their share of employment; other categories had diminished proportions of employment, with farmers, farm laborers, and operatives most affected. Professional categories made the greatest gains; in fact, by 1970, blue-collar occupations were outnumbered by white-collar categories for the first time (Singelmann and Browning, 1978). Also growth rate changes within goods-producing industries modified previous demand for occupational skills, thus changing the structure of occupations within industries. Every industry sector relied more heavily on professional work in 1970 as compared to 1960.

[2]From the perspective of this analysis, among the more important cross-sectional "point in time" analyses of occupational race-segregation are the studies of Bahr and Gibbs, 1967; Brown, 1971; Gibbs, 1965; and Martin and Poston, 1972.

[3]See Johnson, 1980a, 1980c, and 1980d for parallel series for occupational sex-segregation in the United States professional labor force. These studies also constitute first-stage descriptive macrodynamic analyses like those attempted here for racial segregation. These inquiries call attention to, and attempt to offset, a void in labor force knowledge about occupational sex-segregation that is comparable to the shortcomings described herein for occupational race-segregation.

[4]There are many justifications for focusing first on the professions (see Johnson, 1979b: 5-7; Poston and Johnson, 1971: 331-332), but in this

context, the functional importance of the professional occupations to an industrialized society such as the United States is probably a prime argument, as well as the interesting combined patterns of growth, changes in compositional make-up, and shifts in activity locations that have been brought about by the long-term industry shifts in the labor force (see Browning and Singelmann, 1975).

[5]I have elsewhere detailed the factors affecting sex-segregation (see Johnson, 1979b); the patterns for race-segregation are probably as complex.

[6]The Current Population Survey is a household sample survey which is designed to provide reliable monthly statistics on unemployment and the labor force for the non-institutionalized population of the United States. Also, from time to time the CPS serves as a frame for periodical supplemental inquiries and is being used increasingly to fulfill legislative requirements for data to administer public programs (U.S. Bureau of the Census, 1974: 2; 1977b: 1). CPS data are gathered and tabulated by the U.S. Bureau of the Census, which also publishes four series of the Current Population Reports (P-20, P-23, P-27, and P-60) based on the CPS. However, the U.S. Bureau of Labor Statistics bears the primary responsibility for the analysis (see the journal Employment and Earnings, Washington, D.C.: U.S.G.P.O.) and release of these data (U.S. Bureau of the Census, 1974: 2). The March Supplement--used for several Current Population Reports of summary data--includes (as its most important additions) detailed income and work history information, and since 1968 has been disseminated in microdata form as the Annual Demographic File (ADF). Excepting some data about housing, current school enrollment, and a few other items common to the decennial Censuses, the ADF contains most

of the demographic and socioeconomic information associated with population Census data. This information, moreover, is relatively constant from year to year. A smaller, more stringently administered survey than the decennial Census--though its sampling variability is greater--the detailed CPS data may be more accurate than decennial Census data. The universe of the March CPS includes members of the Armed Forces living off post or with their families on post, but excludes all other members of the Armed Forces. Beginning in 1972, the March CPS (and hence the ADF) excludes inmates of institutions.

Because the CPS uses a 16-month, intermittent interviewing schedule for sampled households (4-months in, 8-months out, 4-months in) it is possible to link together consecutive (2-point per annum) longitudinal observations at a match rate (allowing for attrition due to deaths, movers, non-interviews and errors) of about one-third of the sample size (U.S. Bureau of the Census, 1974: 3). Matchability, however, is absent across the 1972-1973 redesign period.

[7]After developing comprehensive annual sexual profiles for the United States labor force (see Johnson, 1980c:9), to develop comparable racial profiles I employed an extract from the 1968-1979 CPS-ADFs of all civilian persons who were 14 years of age or older and employed (i.e., working currently or employed but not working temporarily) in a professional occupation (for 1968-1971, n = 84; 1972-1979, n = 121).

[8]During the exploratory stage of this research, which focused on sexual differences, CPS sample frequencies of profession-specific male-female distributions (taken from total U.S. professional labor-force profile tabulations) were examined in terms of various sociogeographic regions. This revealed that disaggregating the unweighted CPS-ADF tabu-

lations down to the level of states, SMSAs, and Census Regions failed to produce representative subnational profiles.

[9]Among works about employment patterns and trends of blacks, the use of detailed occupation-by-industry-by-race information is uncommon. For instance, Price's (1969) 1960 Census monograph allots three chapters to occupational trends (one using 1940-1960 detailed occupations) but without attention to industry. Hiestand (1964) relied mainly on major occupation categories with limited use--in one chapter--of 1940-1960 detailed occupations and, separately, industry data. Other black employment studies, particularly article-length studies, make only limited use of occupation-by-industry analyses (see, e.g., Snyder and Hudis, 1976).

[10]See Johnson 1980d, note 11, for a statement of the rationale for evaluating alternative applicable schemes of industrial classification. The Browning-Singelmann classification is used rather than others because intrasector activity differentiation is minimal and the advantages of parsimony are retained.

[11]The six columns of Table 2 report the delta index values measuring the degree of occupational race-segregation among black and white professionals in the United States labor force for the years 1968-1979. Each of the twelve annual panels in Table 2 contains two index values for the total professional labor force, and three index values for each of five industry sectors. To illustrate the actual trends that are manifest by all of the Table 2 values, the values have been diagrammed (see Figures 2 and 3) as type-specific annual series.

[12]URD may here be specified in algebraic form as follows:

$$URD = 1/2 \sum_{i=1}^{Nc} \left| \frac{b_i}{b.} - \frac{w_i}{w.} \right|$$

Where N_c = the total number of professional occupations,

$\frac{b_i}{b.}$ = the proportion of blacks in professional occupation i (b_i is the absolute number of blacks in the occupation and b. is the total number of blacks in professional occupations), and

$\frac{w_i}{w.}$ = the proportion of whites in professional occupation i (w_i is the absolute number of whites in the occupation and w. is the total number of whites in professional occupations), and

$c_i = b_i + w_i$.

The mathematical properties that determine the limitations of the dissimilarity index applicable in this research context are discussed elsewhere (see Johnson, 1980b:10-15). This specification measures professional occupational race-segregation not as a deviation from a random chain of events but as a departure from a standard of maximum integration (see Cortese et al., 1976; Kestenbaum, 1980; Winship, 1977).

[13]ARD may be defined algebraically as follows:

$$ARD = 1/2 \sum_{i=1}^{N_c} \left| B_i/B. - W_i/W. \right|$$

where

N_c = the total number of professional occupations

$B_i = pb_i \cdot c_i$ (pb_i is the proportion of blacks in the ith of n occupations and $c_i = 1000$),

$W_i = pw_i \cdot c_i$ (pw_i is the proportion of whites in the ith of n occupations and $c_i = 1000$).

$$B. = \sum_{i=1}^{N_c} B_i \text{ and}$$

$$W. = \sum_{i=1}^{N_c} W_i .$$

(See also Gibbs, 1965; and Williams, 1979.)

[14]To compute the realistically standardized dissimilarity index (RRD) for the six industry categories for each year, the average number of individuals across sectors in each of the professional occupations ($N_i = 84$ for 1968-1971; $N_i = 121$ for 1972-1979) would be substituted into the formula which outlines "absolute" standardization of the summary dissimilarity index. Only one term in the original ARD computational algorithm is altered, as follows:

C_i = the average number of persons in occupation i as computed from all given (S) industry sectors, or

$$C_i = \frac{\sum_{s=1}^{S} C_i}{S}$$

where

C_i = the compositional frequency of occupation i in the S^{th} given industry sector, and

S = the total number of industry sectors being compared.

C_i thus is determined by summing the number of individuals in occupation i over all S disaggregated units of comparison. All other terms in the formula retain their original definitions. The number of standardized blacks, standardized whites, and their respective totals are then derived the same way as outlined for "absolute" standardization. RRD hence may be interpreted as an industry-specific racial differentiation measure which uses the prevailing occupational structure of the total U.S. professional labor force as the standard for comparison.

To effect the more compelling cross-time control simultaneously with the above cross-industry standardization, $\bar{C}_i$ can be computed by averaging the industry-specific number of persons from year to year in each occupation. This metric, however, was not computed here owing to prospects for resolving some of the methodological barriers that presently prevent refining the longitudinal comparability of these "break-in-series" data. For this same reason, cross-time RRD averages were not computed for the total professional labor force.

[15]This is because multiple, ordered changes continually occur in the nature, and location, of almost all occupational activity--also in the characteristics of the incumbent individuals (Terrie, 1979) which like other occupational traits (e.g., place of employment, compensation, and so forth) may systematically be present in occupations only temporarily or intermittently.

[16]The exclusive use, throughout the time-span of the analysis, of any fraction of the professional labor force that can be assembled as "common" or "constant" professional occupations probably will not return completely unbiased and precise comparable indexes. New, developing, or irregular professions--all highly likely to be aligned with general labor force changes--will not easily fit such schemes. Also, several methodological drawbacks prevent applying what appears to be the popular method--using estimates based on the elements contained in the most recent, e.g., 1970, available occupation classes (U.S. Bureau of the Census, 1972c; Williams, 1979; Beller, 1980)--for occupation compositional components for prior years (see also Johnson, 1977: Appendix).

[17]Unit areal considerations, of course (though ruled out by limitations of the data as earlier noted) would require geographical disaggregation, whereas the industry approach simply necessitates classification of the CPS black-white occupation-specific location tabulations.

[18]Attempts to compute the unstandardized and standardized dissimilarity index values for the sixth Browning and Singelmann industry sector, the Extractive sector, consistently resulted in extremely high invalid or no valid (i.e., representative) values. This no doubt was due to the small number of professionals in Extractive occupations (see also footnote 8).

[19]Nevertheless, as Land and McMillen (1980: 8) warned, in connection with their cross-time analysis of mortality statistics, because classification changes "may be evidenced in the observed rates," "we should be aware of substantive interpretations of major breaks in the time series

in the years (for) which any revisions were put into effect." In this instance, the 44 percent upgrading of the 1970 classification implies a likely refinement in the validity and sensitivity of PRD measures. So we are led to expect that minor downward adjustments of no more than 1 to 2 percentage points would likely dissipate any classification discontinuity effects.

[20]"Occupational segregation" is often thought to differ from "occupational differentiation" and to imply differences in work locations. Here, the terms are used interchangeably, as elsewhere, to refer, specifically, to subpopulation differences in actual work roles (activities). Because occupational "categories" rather than independent unit occupations underlie the Census data dissimilarity tabulations utilized in this research, this is an important qualification. Use of these categories to some extent diminishes the validity of dissimilarity measures as indexes of occupational differentiation; but may render them invalid altogether as indexes of location differences. For example, at any point in time it may be that differentiation by race in the occupation category "elementary school teacher" is slight, but black professionals in this occupation may be located mainly in predominantly white schools, and whites may predominate as teachers in black-majority schools. If so, Census occupation dissimilarity measures which accurately measure occupational differentiation at the "category" level will overestimate the true extent of context segregation at the level of specific jobs; it is also likely that intracategory job distinctions (e.g., the proportionate distributions of blacks and whites as math, english, or special education teachers) will not be accurately established.

Appendix A

ALLOCATION OF INDUSTRIES

The following listings of industry codes illustrate how the industry categories reported in the 1969 and 1970-1979 Current Population Survey samples were aggregated to correspond to the 37-industry (six-sector) Browning and Singelmann (1975) classification scheme. The numbers refer, respectively, to those given in the 1969-1979 Description and Technical Documentation manuals (U.S. Bureau of the Census, 1972a, 1973a, 1975, 1977a, 1978, 1979, 1980) that were used in processing each of the work tapes. The industry categories, beginning with 1970, are the same for each subsequent year, hence the allocations for those years are listed but once. The 1969 classifications reported here derive from decoding Browning and Singelmann's 1960 PUS-based allocations into the standard Industrial Classification used for the U.S. 1960 Census of Population and the Current Population Survey tapes. The few "allocated" or "not specified" categories that were used are listed within parentheses.

1960 Allocation	1970 Allocation
Agriculture: 016,017-018	17-19,27-29
Mining: 126,136,146,156	47-49,57-58
Construction: 196	67-69,77-78
Food: 306,307,308,309,316-318,319, 326-329	268-269,278-279,287-289, 297-299
Textiles: 346,347,348,349,356,359, 367	307-309,317-319
Metal: 237,238,239,246,247,248,249	139,147-149,157-159,167-169
Machinery: 256,257,258,259,267,268, 269,276	177-179,187-189,197-199, 207-209,219,227-229,237-238

1960 Allocation	1970 Allocation
Chemical: 406,407,408,409,416,419	347-349,357-359,367-369, 377-378
Misc. Manufacturing: 206,207,208,209 216,217,218,219,236,286,287,289, 296,386,389,387,396,398,426,429, 436,437,438,459	107-109,118-119,127-128, 137-138,239,247-249,257-259, (267),328-329,337-339,379, 387-389, 397-398
Utilities: 567,568,569,576,578,579	467-469,477-479 (499)
Transportation: 506,507,508,509,516, 517,518,519,526	407-409,417-419,427-429 (499)
Communication: 536,538,539	447-449 (499)
Wholesale: 606,607,608,609,616,617, 618,619,626,629	507-509,527-529,537-539, 557-559,567-569,587-588,589
Retail: 636,637,638,639,647,647,648, 649,656,657,658,666,676,678,679, 686,689,696	607-609,617-619,627-629, 637-639,647-649,657-658, 667-668,677-679,687-689, 697-699
Banking: 706,716	707-709 (719)
Insurance: 726	717 (719)
Real Estate: 736	718 (719)
Engineering: 896	888
Accounting: 897	889
Miscellaneous Business Service: 806, 807	727-729,737-739,747-748 (767)
Legal Services: 869	849
Medical Services: 867	828-829,837,839,847-848
Hospitals: 868	838
Education: 876	857-859,867-869
Welfare: 879	877-879
Nonprofit: 888	887
Postal Services: 906	907 (947)
Government: 916,926,936	917,927,937 (947)

1960 Allocation	1970 Allocation
Miscellaneous Professional Service: 898	897 (899)
Domestic Services: 816	769
Hotels: 826	777-778
Eating and Drinking: 659	669
Repair Services: 808,809	749,757-759 (767)
Laundry: 828	779
Barber and Beauty Shop: 838	787-788 (799)
Entertainment: 846,848,849	807-809 (817)
Miscellaneous Personal Services: 836, 829,839	789,797-798 (799)

Note: See Browning and Singelmann, 1975:8 (Table I-1) for the six sector-specific allocations of the above 37 industries.

REFERENCES

Bahr, Howard M. and Jack P. Gibbs. 1967. Racial Discrimination in American Metropolitan Areas. Social Forces, 45 (June): 521-532.

Beller, Andrea. 1980. Occupational Segregation by Sex: Determinants and Changes. Paper presented at the Annual Meetings of the Population Association of America, April 10-12, Denver, Colorado.

Bregger, John E. 1971. Revisions in Occupational Classifications for 1971. Employment and Earnings, 8, 7 (February):5-8.

Broom, Leonard and Norval D. Glenn. 1965. The Transformation of the Negro American. New York: Harper and Row.

Brown, Barbara M. 1971. Occupational Differentiation by Race and Sex in Metropolitan Areas of the United States, 1960. Unpublished Ph.D. Dissertation, Department of Sociology, University of Texas at Austin.

Browning, Harley L. and Joachim Singelmann. 1972. Sectoral Transformation of the Labor Force: A Working Paper. Population Research Center, University of Texas at Austin, Mimeo.

_____. 1975. The Emergence of a Service Society: Demographic and Sociological Aspects of the Sectoral Transformation of the Labor Force in the U.S.A. Springfield, VA: National Technical Information Service.

Cortese, Charles, F. R. Frank Falk and Jack K. Cohen. 1976. Further Considerations in the Methodological Analysis of Segregation Indices. American Sociological Review, 41(August): 630-637.

Duncan, Otis D. and Beverly Duncan. 1955. A Methodological Analysis of Segregation Indexes. American Sociological Review, 20 (April):210-217.

Farley, Reynolds. Changing Levels of Racial Segregation in Public Schools: 1967-1970. N.D., Mimeo.

Gibbs, Jack P. 1965. Occupational Differentiation of Negroes and Whites in the United States. Social Forces, 44 (December): 159-165.

Gross, Edward. 1968. Plus ca change?...The Sexual Structure of Occupations over Time. Social Problems, 16 (Fall): 198-208.

Hiestand, Dale L. 1964. Economic Growth and Employment Opportunities for Minorities. New York: Columbia University Press.

Johnson, Gordon C. 1977. Metropolitan Sustenance Structure and Professional Sexual Differentiation: A Human Ecological Approach. Unpublished Ph.D. Dissertation. Department of Sociology, University of Texas at Austin, Austin, Texas.

_____. 1979a. Metropolitan Professional Sexual Differentiation, 1970: An Ecological Profile. Institute for Research on Poverty Discussion Paper #573-79. Madison: University of Wisconsin.

_____. 1979b. Metropolitan Professional Sexual Differentiation: Toward A Human Ecological Theory. Institute for Research on Poverty Discussion Paper #584-79. Madison: University of Wisconsin.

_____. 1980a. Studies of Trends in Professional Sexual Differentiation: An Exegesis. Unpublished Manuscript.

_____. 1980b. Components of Sustenance Organization and Sexual Differentiation: The Metropolitan Professional Labor Force, 1960-1970. Center for Demography and Ecology Working Paper #80-11. Madison: University of Wisconsin-Madison.

_____. 1980c. Changes in the Sex Structure of Professional Occupations, 1969-1979. Paper presented at the Annual Meeting of the Population Association of America, Philadelphia, Pennsylvania, April 1979.

_____. 1980d. Professional Occupational Sex-Segregation: Metropolitan (1960-1970) and National (1969-1979) Trends. Unpublished manuscript.

Kestenbaum, Bert. 1980. Notes on the Index of Dissimilarity: A Research Note. Social Forces, 59, 1 (September): 275-280.

Kirby, David J. et al. 1973. Political Strategies in Northern School Desegregation. Lexington, Mass: D. C. Heath.

Land, Kenneth and Marilyn C. McMillen. 1980. A Macrodynamic Analysis of Changes in Mortality Indexes in the United States, 1946-75: Some Preliminary Results. Social Indicators Research, 7: 1-46.

Marrett, Cora Bagley. 1980. The Precariousness of Social Class in Black America. Contemporary Sociology, 9, 1 (Jan.):16-19.

Martin, Walter and Dudley L. Poston. 1972. The Occupational Composition of White Females: Sexism, Racism, and Occupational Differentiation. Social Forces, 5 (March):349-355.

Poston, Dudley L. and Gordon C. Johnson, Jr. 1971. Industrialization and Professional Differentiation by Sex in the Metropolitan Southwest. Social Science Quarterly, 52 (September):331-348.

Price, Daniel O. 1969. Changing Characteristics of the Negro Population. Washington: U.S. G.P.O.

Singelmann, Joachim and Harley L. Browning. 1978. Components of Change in the U.S. Occupational Structure, 1960-1970. Center for Demography and Ecology Working Paper 77-39. Madison, Wisconsin: University of Wisconsin-Madison.

_____. 1980. Industrial Transformation and Occupational Change in the United States, 1960-1970. Social Forces, 59 (September):246-264.

Snyder, David and and Paula Hudis. 1976. Occupational Income and the Effects of Minority Competition and Segregation: A Reanalysis and Some New Evidence. American Sociological Review, 41, 2 (April): 209-234.

Taeuber, Karl E. 1967. White-Negro Occupational Differentials. Proceedings of the Social Statistics Section, 1967 (American Statistical Association), pp. 254-257.

_____ and Alma F. Taeuber. 1976. A Practitioner's Perspective on the Index of Dissimilarity. American Sociological Review. 41 (October):884-889.

Terrie, Walter E. 1979. Changes in U.S. Occupational Status Between 1960 and 1970 and Some Demographic and Structural Correlates of the Changes. Paper presented at the Annual Meetings of the Population Association of America, Denver, Colorado, April, 1979.

United States Bureau of the Census. 1963. The Current Population Survey: A Report on Methodology, by Joseph Steinberg, Thomas B. Sabino, and Leon Pritzker. Technical Paper 7. Washington, D.C.: U.S. GPO.

_____, Census of Population, 1960. 1962. Detailed Characteristics. Final Reports PC(1), 2-52D. Washington, D.C.: U.S. Government Printing Office.

_____, 1960. 1963. Characteristics of the Population, I. Parts 2-52. Washington, D.C.: U.S. GPO.

_____, 1967. Concepts and Methods Used in Manpower Statistics from the Current Population Survey. Current Population Reports, Series P-23, No. 22, Washington, D.C.: U.S. GPO.

_____. 1972a. Description and Technical Documentation. Current Population Survey, Annual Demographic File, 1968-1971. Washington, D.C.: U.S. GPO.

_____. 1972b. The Current Population Survey: An Overview. Paper prepared for the Conference on the Current Population Survey, September, 1972 by Marvin M. Thompson and Gary Shapiro.

_____. 1972c. 1970 Occupation and Industry Classification Systems in Terms of Their 1960 Occupation and Industry Elements. John A. Priebe, John Heinkel, and Stanley Greene. Technical Paper No. 26, Washington, D.C.: U.S. GPO.

_____. 1973a. Description and Technical Documentation. Current Population Survey, Annual Demographic File, 1972. Washington, D.C.: U.S. GPO.

_____. 1974. Data Access Descriptions: Microdata from the CPS--The Annual Demographic File. Washington, D.C.: U.S. GPO.

_____. 1975. Description and Technical Documentation. Current Population Survey Annual Demographic File, 1973-1974, 1973-1975.

_____. 1976. Concepts and Methods Used in Labor Force Statistics Derived from the Current Population Survey. Current Population Reports, Series P-23, No. 62. Washington, D.C.: U.S. GPO.

_____. 1977a. Technical Documentation. Annual Demographic File (March Supplement of Current Population Survey)--1976. Customer Services Branch, Data User Division. Washington: U.S. GPO.

_____. 1977b. The Current Population Survey: Design and Methodology. Technical Paper 40. Washington: U.S. GPO.

_____. 1977c. An Evaluation of 1970 Census Occupation Classification: The Post-Censal Manpower Survey--Census Match Study. Technical Paper No. 41. Washington: U.S. GPO.

_____. 1978. Technical Documentation. Annual Demographic File (March Supplement of Current Population Survey)--1977. Customer Services Branch, Data User Division. Washington: U.S. GPO.

_____. 1979. Technical Documentation. Annual Demographic File (March) Supplement of Current Population Survey)--1978. Washington: U.S. GPO.

_____. 1980. Current Population Survey, March 1979. Technical Documentation. Washington, D.C.: U.S. GPO.

Williams, James Gregory. 1979. The Changing U.S. Labor Force and Occupational Differentiation by Sex. Demography, 165, 1(February):73-87.

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

Winship, C. 1977. A Revaluation of Indexes of Residential Segregation. Social Forces, 55(June):1058-1066.