Measuring School Desegregation*

Micheal W. Giles, *Department of Political Science, Florida Atlantic University*

In the *Brown* decision of 1954, the United States Supreme Court declared racial segregation in public schools to be unconstitutional.[1] In this and in succeeding decisions, the Court called for a qualitative change in public policy from "dual" or racially segregated school systems to "unitary" or desegregated systems. While these decisions resulted in a dismantling of the legal foundations of segregated education, they often failed to alter significantly the actual racial balance of students attending public schools. Racial isolation continued with the vast majority of black and white students attending schools primarily with members of their own race.[3] In time, Federal Courts began to require quantitative changes in the racial balance of schools as a test of qualitative change.[4] In its attempts to enforce school desegregation, the Department of Health, Education and Welfare has similarly focused on quantitative indicators of change in the racial composition of schools.[5] Despite the fact that legal and administrative decisions concerning school desegregation have rested increasingly on quantitative concepts, little attention has been directed toward the development of a uniform and rigorous method for measuring school desegregation. The purpose of the present article is to suggest such a measure.

[1]*Brown v. Board of Education*, 347, U.S., 483 (1959).

[2]*Brown v. Board of Education*, 349, U.S., 294 (1955); *Green et. al. v. County School Board of New Kent County*, et. al., 391, U.S., 430; *Alexander et. al. v. Holmes County Board of Education*, et al., 396, U.S., 1218.

[3]Thomas R. Dye, *American Public Policy: Documents and Essays* (Columbus, Ohio: Merrill, 1969), pp. 18-19.

[4]The Supreme Court's basic objection to "Freedom of Choice" plans was one of numbers. *Green et al.* 391 U.S., 430. See also *Barksdale v. Springfield School Committee*, 372, F. Supp., 543, modified, 348, F 2d., 261.

[5]H.E.W. Title VI compliance reports require detailed breakdowns of minority enrollments in every school in the reporting districts. U.S. Commission on Civil Rights, *H.E.W. and Title VI*, (Washington: U.S. Commission on Civil Rights Clearing House, 1970), pp. 18-20.

A primary consideration in formulating a measure of de-segregation is defining the zero point on the scale—that is, deter-mining what condition or conditions constitute desegregation for a school district. The Courts have shown little concern with this problem. Legal decisions have been confined to the facts of each particular case rather than prescribing general rules for future decisions.

Some attempts to define desegregation have been made through legislative and/or executive action. The Allen Report of 1964 de-fined a desegregated school in New York City as one "enrolling fewer than 90 per cent or more whites."[6] The 90 per cent figure is also one of the indicators of segregation used by HEW's Office of Civil Rights.[7] The Massachusetts Racial Imbalance Act of 1965 defined a school as racially imbalanced when the per cent of non-white students in the school exceeded 50 per cent of the total number of students.[8] By extension, a desegregated school system under the Allen & HEW criteria would be one with no school over 90 per cent minority enrollment; under the Massachusetts Act, a system with no school over 50 per cent minority enrollment would be desegregated.

Whether the definitions are applied to an individual school or entire districts, problems with the quota approach are readily ap-parent. A school district might have several schools with 89 per cent or 49 per cent minority enrollments and still qualify as de-segregated. Moreover, rigid quotas do not take into account the size of the minority enrollment in a school district. A school sys-tem with a small minority enrollment might isolate that group in a few of its schools with just enough whites to pass the quota. Most importantly perhaps, quotas are without theoretical or practical justification. Why select 90 per cent or 50 per cent rather than some other percentage point?

The Supreme Court recently suggested a different benchmark for measuring desegregation. In *Swann v. Charlotte-Mecklenberg* the Court stated that "awareness of the racial composition of the whole school system is likely to be a useful starting point in shaping a remedy to correct past constitutional violations."[9] The use of the racial composition of the school system as a criterion for assessing desegregation was not a new suggestion with the Court. This criterion had previously been suggested by Adam Clayton

---

[6]James Bolner, "Defining Racial Imbalance in Public Educational Institutions," *Journal of Negro Education*, XXXVII (Spring, 1968), 115.

[7]*H.E.W. News*, U.S. Department of Health, Education, and Welfare, June 18, 1971.

[8]Bolner, *op. cit.*, p. 117.

Powell and was incorporated in the language of the Massachusetts Act.[10] Use of the racial composition of the school system as a "zero point" overcomes many of the problems associated with the selection of an arbitrary quota figure. First, it takes into consideration the actual percentage minority enrollment in the particular school system. Second, it can be justified theoretically. If a minority group had never been discriminated against, then its members should be randomly distributed throughout the total population. A minority group whose children constituted 25 per cent of a system's total enrollment would be expected *ceteris paribus* to constitute 25 per cent of the enrollment in each school in the system.

For a school system to qualify as totally desegregated using this criterion, the racial balance in each school would have to reflect the racial balance of the total school system enrollment. Obviously, many individuals would accept a less strenuous criterion for desegregation. Powell himself was willing to accept a 20% deviation from system racial balance.[11] The selection of system racial balance as the criterion for desegregation, however, assures maximal agreement. While many would accept a less stringent criterion, few would argue that desegregation has not been achieved when this criterion is met. Thus, the racial balance of the school system appears to be an ideal zero point.

Equally important in constructing a measure of desegregation is the determination of its maximum value. That is, what condition or set of conditions define a segregated school system. The arguments surrounding this subject parallel those surrounding the definition of a zero point. If racial balance is used as the criterion for the zero point, however, the corresponding maximum value would be complete racial isolation. With this criterion the measure would reach its maximum value when all the black students in a district are located in schools that have no white students.

III

The index we propose will measure the departure of the actual racial composition of all schools in a system from that projected on the basis of the racial balance for the whole school district. Consistent with the preceding discussion, the index will equal .0 when the racial balance in every school is identical with the racial balance of the school district, and will attain its maximum value of 1.0 when complete racial isolation is present. A mathematically similar

[9]*Swann et al. v. Charlotte-Mecklensburg Board of Education*, 402, U.S. 1, pp. 22-25.
[10]Bolner, *op. cit.*, pp. 118-122.
[11]*Ibid.*, p. 121.

index has already been developed by the Taubers as a measure of residential segregation.[12]

The central element of the Tauber index is the absolute difference between the ratio of white households on a given block to total white households in the city and black households on the same block to total black households in a city. Or mathematically stated:

$$\frac{bi}{B} - \frac{wi}{W}$$

where bi and wi are the number of nonwhite and white households, respectively, in block i, and B and W are the total nonwhite and white households in the city. If a block is racially balanced it should contain the same percentage of the total white and the total black households in the city. Where this is the case the above difference will equal zero. Similarly, the greatest difference will occur when one of the ratios equals zero. To obtain a measure of residential segregation (D), the absolute differences for each block in a city are summed and halved (D = ½ the sum of the absolute differences of bi/N - wi/W).

This index is easily adapted as an index of school segregation (SI) by substituting schools for blocks and students for households. A few examples should suffice to clarify this procedure. Each hypothetical school district portrayed in Tables I-III has a total enrollment of 2000 students evenly divided between Blacks and whites. In Table I all of the black students in the district are concentrated in two schools, B and D. The black students are not racially isolated, however, since white children also attend these two schools. Indeed, neither of these schools would qualify as a segregated school under the New York criteria. However, using criterion for desegregation, an obvious imbalance is present in the distribution of black and white school children. This imbalance is reflected in the index value of .60 for this school district. In Table II the black and white children are equally distributed among the five schools in the district. In keeping with the criterion of district racial balance, the index of segregation for this district is .00. In Table III the opposite situation is presented. All the black students again are located in schools B and D, but in this case they are totally isolated. No white children attend these two schools. This distribution of school children clearly qualifies as totally segregated. The index achieves its maximum value of 1.00 in this situation.

[12]Karl E. Tauber and Alma F. Tauber, *Negroes in Cities* (Chicago: Aldine Publishing Co., 1965), pp. 195-254.

The index of segregation thus varies between zero, signifying perfect balance, and 1.00 indicating total isolation. The limiting values neatly conform to substantive criteria. In addition, the particular value which the index attains between these two extremes has a meaningful substantive interpretation. The index value indicates the percentage of the total black and white students who would have to change schools in order to achieve racial balance. Referring to Table I, the index value of SI = .60 signifies that, to

TABLE I
Segregation Index in a Partially Desegregated
School System

SCHOOL	WHITE ENROLLMENT	BLACK ENROLLMENT	DIFFERENCE
A	200	0	.20
B	200	500	.30
C	200	0	.20
D	200	500	.30
E	200	0	.20
	1000	1000	1.20

SI = .60

achieve racial balance, either 60 per cent of the black students or 60 per cent of the white students, or some equivalent combination of both (e.g., 30% white and 30% black), would have to change schools. For example, by transferring three hundred black students out of each of the predominantly black schools, B and D, and dividing them equally among the remaining all-white schools, the situation protrayed in Table II would be achieved. Conversely, the 600 white students in schools A, C, and E could be divided equally

TABLE II
Segregation Index in a Completely Desegregated
School System

SCHOOL	WHITE ENROLLMENT	BLACK ENROLLMENT
A	200	200
B	200	200
C	200	200
D	200	200
E	200	200
	1000	1000

SI = .00

The Journal of Negro Education   521

between the two predominantly black schools to achieve desegregation. Thus, the value that the index assumes for a particular school district or desegregation plan has real policy significance beyond its purely mathematical properties.

TABLE III
Segregation Index in a Completely Segregated
School System

SCHOOL	WHITE ENROLLMENT	BLACK ENROLLMENT	DIFFER-ENCE
A	300	0	.30
B	0	500	.50
C	400	0	.40
D	0	500	.50
E	300	0	.30
	1000	1000	2.00
		SI = 1.00	

IV

The index we have proposed provides a theoretically justified and substantively interpretable measure of desegregation in a school district. As such, it should prove a useful tool for desegreation policy planning and implementation. Presently, courts use an often bewildering array of percentages in discussing plan impacts. For example, in evaluating the status of desegregation in Hillsborough County, Florida, a District Court Judge observed:[13]

> . . . as of October 23, 1970, 9,106, or 46 percent of the system's blacks were attending 15 black schools. Although they comprised only 19 percent of the student population, 13,606, or 69 percent, were in 28 schools at least 50 percent black. On the other hand, 69 percent of the white students—57,869 out of 83,474—attended 65 schools either all white or at least 95 percent white.

The index provides a simple means to summarize such arrays and, thus, to evaluate the aggregate impact of a desegregation plan.

The index might also be used to examine temporal change in the status of desegregation in a school district (or districts). By comparing the index of segregation for two different school years, the direction and amount of change may be obtained straightforwardly. Finally, the index might be applied to two or more pro-

[13]*Manning et. al. v. The Board of Public Instruction of Hillsborough County*, U.S. District Court for the Middle District of Florida, Tampa Division; No. 3554 Civ. T.

posed desegregation plans to measure the relative impact of each. In general, the index of segregation can simplify the tasks of policy-makers and provide a more rational basis for discussing, selecting and evaluating desegregation plans.[14]

The index should also prove a valuable aid to research in the area of school desegregation. To date, most desegregation research has focused on the presence or absence of racial heterogeneity in the schools, or the percentage Negro enrollment in schools 90 per cent or more Negro.[15] The index of segregation is clearly a more theoretically justified and more sensitive measure of desegregation than either of these approaches. Indeed, both of the earlier measures may indicate desegregation has occurred in a school district despite the continued presence of significant racial imbalances. Thus, as the level of desegregation increases and the significant questions for research become ones of degree (e.g., Do school districts in "voluntary compliance" demonstrate more desegregation than school districts under Court order?), the segregation index appears to be a needed improvement over existing measures of school desegregation.

Along with its strengths, the proposed measure also has some inherent limitations that must be kept in mind by policy-makers and researchers alike. First, the index focuses on inter-school racial balances and is not sensitive to intra-school resegregation brought about through classroom assignment, vocational programs, remedial courses, tracking systems, etc. Second, the total process of desegregation extends to questions of the quality of programs at various schools, the equity of school discipline, personnel recruitment and promotion procedures, and a multitude of similar factors. The index, however, reflects only numerical desegregation in an entire system. Thus, while the index of segregation is a valuable tool and an improved means of examining one very important element of school desegregation, it does not substitute for an intensive examination of the many aspects of desegregation. Rather, its major use should be to supplement and augment such analyses.

[14]By policy-makers we refer to all school planners, H.E.W. enforcement officers, Federal District Court judges, etc., who must make, design or evaluate school desegregation plans.

[15]Thomas R. Dye, "Urban School Desegregation," *Urban Affairs Quarterly*, II (December, 1968), 141-164; Thomas F. Pettigrew and M. Richard Cramer, "The Demography of Desegregation," *Journal of Social Issues*, XV (Fall, 1959), 61-71.