

## **J. P. Rushton's Aggregational Errors in Racial Psychology**

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*Contrary to Rushton's postulates, aggregating large cohorts of methodologically weak studies leads to misleading conclusions. The review of his data shows that nonprofessional skull collections were included (race was possibly estimated from skull size) and the impact of factors, such as infant malnutrition and climate, on cranial or brain size was ignored. Statistical reanalyses of cranial data show that cranial size (a) is not a viable indicator of intelligence and (b) is similar in Negroids and Caucasoids from the same settings: It varies with the standard of living and climate (smaller crania are found in underdeveloped, warmer countries), not with race.*

In 1983, Rushton, Brainerd, and Pressley praised the principle of aggregation as a method for summarizing trends in the results from various studies and providing a statistical platform for theory testing or development. In their words,

According to the principle of aggregation, the sum of a set of multiple measurements is a more stable and unbiased estimator than any single measurement from the set. One reason is that there is always error associated with measurement. When several measurements are combined, these errors tend to average out, thereby providing a more accurate picture of relationships in the population. (pp. 18-19)

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**AUTHOR'S NOTE:** *This article is based on a paper presented by the author at the 25th International Congress of Psychology held in Brussels, Belgium, July 19-24, 1992. Correspondence should be addressed to Dr. Z. Cernovsky, Department of Psychology, St. Thomas Psychiatric Hospital, St. Thomas, Ontario, Canada N5P 3V9.*

JOURNAL OF BLACK PSYCHOLOGY, Vol. 19 No. 3, August 1993 282-289  
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In particular, one of the recommended major applications of this principle was in cases of important behavioral variables "presumed to be unrelated because of repeated failures to obtain substantial correlations" (p. 18). According to Rushton et al. (1983), "Such null findings have often been due to failures to aggregate" (p. 18). Rushton and his colleagues presented numerous examples of research data for which the application of aggregation approach appeared fruitful. They concluded that the weak statistical relationships routinely observed in the relevant literature could be consequences of failures to aggregate.

The present article is a methodological case study of J. P. Rushton's application of his aggregation principle to research on racial differences. Rushton's (1988) theory of racial differences assumes that three racial groups—Mongoloids, Caucasoids, and Negroids—significantly differ on a multitude of variables and that the Mongoloids rank higher in the socially desirable direction, the Caucasoids are in an intermediate position, and the Negroids are at the bottom of the hierarchy. According to Rushton's model, the Negroids would be genetically less intelligent (as shown by skull or brain size and also by IQ scores), less sexually restrained, but more prone to crime and mental illness. Rushton (1988) provided numerous references to empirical studies to support his theoretical ratings of human races. However, it has been sufficiently shown by various authors that his literature review is blatantly biased, his logic strained, and that he occasionally resorts to non-scientific sources of evidence, such as semipornographic literature (e.g., *Penthouse* or anonymous notes by "the French Army Surgeon" from 1898), overinterprets minor trends in the data, and uses pseudoscientific procedures, such as inferring intelligence from measures of head circumference by tape (Cain & Vanderwolf, 1990; Cernovsky, 1990, 1991, 1992; Cernovsky & Litman, 1992, 1993; Flynn, 1989, 1990; Lynn, 1989a, 1989b; Weizmann, Wiener, Wiesenthal, & Ziegler, 1990, 1991; Zuckermann & Brody, 1988). At present, there is clearly no sufficient empirical support for Rushton's dogma about genetic differences between the three human races on any of his key variables, that is, brain size, intelligence, crime rates, prevalence of mental illness, and sexual behavior (see review by Cernovsky, 1992).

It is noteworthy that Rushton (1988, 1990a) provided abundant literature references with respect to alleged racial differences in brain or cranial size, perhaps due to his initial assumption (see Rushton, 1988; also see Cernovsky, 1990, 1991) that these could be seen as biological indicators of intelligence. His biased review of brain size studies includes obsolete or invalid data. For example, Weizmann et al. (1991) criticized Rushton for his reliance on museum skull collections because these collections tend to have peculiar

social histories. Often, the collector was a layperson and only estimated the race of the skull on the basis of personal misconceptions or political convictions. As explained in Weizmann et al. (1991), the crania from the ancient Caucasian sample of Samuel Morton's famous 19th-century collection of skulls (Gould, 1978), were collected by George Glidden (Stanton, 1965), the American vice-consul general in Alexandria, an adventurer and a supporter of slavery and of the Confederacy. Glidden's motivation in collecting the skulls was to prove that the creators of ancient Egyptian civilization were White (Stanton, 1965) and that ancient Blacks, like those of Glidden's time, existed only in positions of subservience and servitude. Many Northern Europeans and Americans dealt with the embarrassing fact that civilization arose in Africa by denying Blacks any significant role in its creation. Of course, if the data relied on by Rushton were systematically biased, his aggregated measures are of no scientific value. The "principle of aggregation" is no panacea for invalid or systematically biased data and cannot be used as a *substitute for contemporary sampling methodologies*.

The focus of this article is on Rushton's application of the principle of aggregation (averaging across samples) to cranial size data (see Table 2 in Rushton, 1990a, based on a review by Herskovits, 1930; also see comments by Rushton, 1991a). There are numerous major methodological and statistical problems with his use of these tabular data.

First, the skulls are of unknown gender, and the gender differences in skull size are at least comparable to those observed between races (women tend to have smaller brains, regardless of race; see criticisms by Cain & Vanderwolf, 1990; Cernovsky, 1990, 1991). His tabular data are obviously of a dubious value, especially for the interpretation of possible racial differences in brain size as differences in intelligence (men and women do not differ in intellectual skills even though they differ in average brain size).

Second, calculating an ANOVA on averages of subsamples instead of statistically using the original standard deviations of each subsample tends to artificially reduce the within-group variance. Because the ANOVA is a comparison of between-group and within-group variance, Rushton's procedure overestimates the magnitude and significance level of between-group differences in his data.

Third, as generally known, it is not sufficient to demonstrate a significant difference in aggregated data of racial groups in order to claim that this difference is genetic and to imply that it is relatively immutable. Rushton does not provide credible and sufficient evidence in favor of genetic over environmental explanations for any of his alleged racial differences.

Fourth, Rushton's frequent interpretational reliance on arithmetic averages as a suitable substitute for more adequate and powerful statistical techniques is archaic and methodologically unacceptable. The folly of this approach can be best shown by Rushton's repeated misinterpretations and misrepresentations of anthropological analyses conducted by Beals, Smith, and Dodd (1984). Their large-scale computerized analysis of cranial size data documented that the highest correlates of brain size were climatic variables, not race. Beals et al. concluded that race is not likely to be a determinant of brain size. The correlations found by Beals et al. to some of the climatic variables exceeded .60; that is, they were at levels far above those normally reported for racial groups. Warmer climate was associated with smaller crania, regardless of race.

It is generally known that infant malnutrition has been found to result in reduced brain size (Monckeberg, 1973). Malnutrition (e.g., as resulting from economic underdevelopment), common in excessively warm countries, could more parsimoniously account for "racial differences" in Rushton's data summaries than race. And, in fact, if we inspect one of Rushton's most detailed data summaries of cranial size (prepared by Rushton, 1990a, on the basis of Hershkovits, 1930), the data match the pattern empirically detected by Beals et al. rather than the one postulated by Rushton: The cranial capacity of the Blacks from colder climates (North-American sample: average capacity = 1,622 cm<sup>3</sup>, *N* = 961) is comparable to those of Northern Caucasians (e.g., Swedes: average = 1,593 cm<sup>3</sup>, *N* = 46,975), whereas the African Caucasians (the Cairo sample in Rushton's table: average = 1,502 cm<sup>3</sup>, *N* = 802) have values similar to African Blacks: for example, the Masai (average = 1,508 cm<sup>3</sup>, *N* = 91) and the Kajiji (average = 1,515 cm<sup>3</sup>, *N* = 55).

Rushton (1990a, 1990b, 1990c, 1991a) frequently misrepresents the study by Beals et al. by implying that their conclusions are consistent with his predicted hierarchical racial pattern. In his own words (as printed in Rushton, 1990c),

Beals, Smith, and Dodd (1984) computerized the entire world data base of 20,000 crania gathered by 1940 (after which data collection virtually ceased because of its association with racial prejudice), grouped them by continental area, and found statistically significant differences. The sex-combined brain cases from Asia averaged 1380 cm<sup>3</sup> (SD = 83), those from Europe averaged 1362 cm<sup>3</sup> (SD = 35), and those from Africa averaged 1276 cm<sup>3</sup> (SD = 84). (pp. 322-323)

Of course, the conclusions by Beals and his teams are strikingly different: namely, that correlations of cranial size and race are only a secondary reflection of an underlying correlation with climatic zones and that members

of the same racial group spread over various climatic zones show the predicted variation in cranial capacity (those residing in warmer climates have smaller crania). With respect to the average data for continental areas (those for Asia, Europe, and Africa, misguidedly reported by Rushton), the readers were sufficiently forewarned by Beals et al. that "if one merely lists such means by geographical region or race, causes of similarity by genogroup and ecotype are hopelessly confounded" (p. 306).

Fifth, Rushton ignores the most elementary principles of scientific sampling. His theory would require representative samples of human races based on a scientific definition of the race (Rushton did not provide any), especially if it is to imply genetic differences.

Sixth, an adequate sampling, in this special case, would also require adequate historical data to support the underlying assumption that the racial differences or the sample values are stable over time, that is, relatively immutable. Rushton's work shows a naive neglect of historical trends and cycles. The within-group variance on Rushton's variables (e.g., with respect to sexual mores and practices) is underestimated when measured on a cross-sectional basis only, that is, within the present culture.

Seventh, in the majority of the cranial data, Rushton relied on archaic measurements methods, that is, on old measures of skull width and length only. Cranial capacity was estimated only from the measures of width and length, with the assumption that cranial height did not vary. Minor errors in estimating the height are magnified when three dimensions are involved. Removal of even a 0.5 cm thin horizontal slice from the brain could result in a difference of many cubic centimeters of brain tissue.

It can be noted that in his own "research" Rushton has recently also used the discredited archaic method of measuring head circumference by tape (see Bogaert & Rushton, 1989).

Eighth, as already discussed elsewhere (Cernovsky, 1990), Rushton (1988) assumed that brain size or skull size can be used as an indicator of intelligence (in his Table 1, Rushton listed brain and cranial size as indicators of intelligence of the races). However, his own summaries of relevant data indicated that only about 3.2% of variance was shared between intelligence and cranial or brain size (Cernovsky, 1991). Although he now denies using skull circumference measures as a substitute for IQ scores (see Rushton, 1990b), his error is well documented in his earlier written work. So far, he has not produced a logically coherent defense for, or an interpretation of the meaning of, his use of absolute brain size data (or their crude estimates from external cranial measurements) in his discussion of racial differences (Cernovsky, 1991, 1992; Rushton, 1991b).

As stated at the beginning of this article, Rushton et al. (1983) praised the aggregation principle as a valuable tool for unveiling relationships among variables that were "presumed to be unrelated because of repeated failures to obtain substantial correlations" (p. 18). Rushton's personal use of the aggregation methodology involves an erroneous neglect of within-group variances, an acceptance of unscientific sources of evidence, a systematically biased review of literature (see also a more detailed discussion of Rushton's misuse of Tobias's tabular summaries by Cernovsky, 1992), a failure to consider and examine alternative explanations for possible trends in the data, and an overreliance on archaic methodology and archaic data as a rapid means of producing "research evidence." Of course, with this strategy, significant differences could be detected between almost any conceivable samples on any conceivable variable in any desired direction.

Rushton is certainly not alone in his methodologically incompetent attempts to produce empirical support for his racist postulates. Recently, it was reported by Kamin and Grant-Henry (1987), in their scholarly discussion of Arthur Jensen's writings on "differences in intelligence" between American Blacks and Whites, that Jensen selectively published *only* those data from his own research that were consistent with his racist bias; nonsupportive data were not published. Aggregation procedures on similar data can produce only biased results. The article by Kamin and Grant-Henry has been ignored by Rushton: To a large extent, Rushton's "theory" of race and intelligence erroneously relied on Jensen's work.

Why is there any need for discussing Rushton's work if it is methodologically incompetent to the extent seen in undergraduates? Rushton is an extremely polished, active, and skilled orator and a persuasive political writer who pathologically lacks in compassion and sensitivity to the psychological harm he causes to millions of Black children around the world, in terms of self-esteem, career expectations, and civil rights. At this time, Rushton, Jensen, and their followers or clones still have well-entrenched positions in the career echelon of academic psychology and are seen by a large proportion of the misguided public as credible scientists. The situation is largely comparable to the one in Nazi Germany in the 1930s when Nazi "scientists" were artificially promoted to credible university positions and "scientifically" documented the "genetic inferiority" of the Jews to provide a pretext for their extermination. The onus is on us to more actively disseminate objective scientific information about inherent flaws in Rushton's and Jensen's procedures or methods and re-educate our students and the public.

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