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AUTHOR Cernovsky, Zack Z.
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ABSTRACT

The term "statistical significance" is often misunderstood or abused to imply a large effect size. A recent example is in the work of J. P. Rushton (1988, 1990) on differences between Negroids and Caucasoids. Rushton used brain size and cranial size as indicators of intelligence, using Pearson "r"s ranging from 0.03 to 0.35. These statistical facts indicate that the relationship of brain size to intelligence is too weak and inconsistent to use brain size as a measure of intelligence. Based on similarly modest relationships in some studies of race to brain size and crime, he classified Negroids as genetically inferior to Caucasoids. Due to methodological errors and a poor review of literature, he also rated Negroids as inferior on other variables such as mental health. In summary, Rushton's writings about human races are statistically unfounded. One table is presented, derived from Rushton. (Author/SLD)

STATISTICAL MISCONCEPTIONS AND RUSHTON'S WRITINGS ON RACE.

Zack Z. Cernovsky, Ph.D.

University of Western Ontario

London, Ontario, Canada

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ABSTRACT

The term "statistical significance" is often misunderstood or abused to imply a large size effect. A recent example is Rushton's (1988, 1990) work on differences between Negroids and Cacausoids. Based on Pearson rs ranging from .03 to .35, he used brain size as indicator of intelligence. And, based on similarly modest relationships, in some studies, of race to brain size and crime, he classified Negroids as genetically inferior. Due to methodological errors and poor review of literature, he also rated Negroids as inferior on other variables such as mental health.

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Recent textbooks of statistics often warn the readers that statistical significance should not be confused with scientific significance (McCall, 1986) or also with effect size (see e.g., Welkowitz, Ewen, & Cohen, 1988). Some tests, e.g., the t-tests, provide only estimates of significance, not of the effect size. Authors who use only significance but not effect size tests (e.g., Rushton, 1990a) frequently mislead the general public by overinterpreting their data on the media. In general, it is sobering to convert the estimates such as the t values into other statistics which assess also the effect size, e.g., the Pearson r. Conversion formulae for this operation are now available in some basic textbooks (Welkowitz et al., 1988).

However, the conversion into the Pearson rs alone is not a sufficient remedy unless the user is a competent scientist, trained in the interpretation of r values. Interpretational errors were quite common in the history of psychology and are still occasionally spotted in contemporary publications by our colleagues. Most common error is, of course, an interpretation of very low (<.20) but statistically significant rs as indicating a trend of large size. This error is discussed in introductory textbooks to psychology, e.g., by Atkinson, Atkinson, & Hilgard (1983): "Correlations between 0.00 and .20 must be judged with caution and are only minimally useful in making predictions. One should be suspicious of investigators who make strong claims that are based on correlation coefficients in this lower range."

Rushton generously presented his "research" of racial differences on public media in the recent years. It is shown in the present paper that his claims are largely based on effects equivalent to r of about .20, and often even lower. First, Rushton (1988, see Table 1 in the present paper) used brain size and cranial size as indicators of intelligence. His own review of various studies showed that the underlying Pearson rs ranged from .03 to .35 (Rushton, 1990b). The average r, calculated from his data, was .18 (see Cernovsky, 1991). These statistical facts indicate that the relationship of brain size to intelligence is too weak and inconsistent to use the former as a measure of the latter. The inconsistency can also be illustrated by clinical examples. The clinical literature shows that (1)lower brain size in women than men does not have a counterpart in a lower intelligence of women, and (2)persons who do not have almost any cerebral cortex may still score above IQ level of

120 on standard intelligence tests and successfully study mathematics at the university level (Lorber's case studies, reported in Lewin, 1980).

Second, in line with data from his Table 1, Rushton leaves the general public (via his interactions with mass media) with the impression that the Negroids are small brained, dull, oversexed, and prone to crime and mental illness, when compared to Caucasoids. With respect to crime, Rushton (1990a) reviewed Interpol data from 1984 and 1986, calculated ANOVA, and concluded that blacks had significantly higher crime rates than Caucasoids (and the Caucasoids higher than Mongoloids). His data (see Rushton, 1990a, Table 2), when converted into Pearson rs, lead to an average r of .24 (Cernovsky & Litman, in press). This suggests less than 6% of shared variance between crime and race, as defined by Rushton. Furthermore, of tremendous damage to Rushton's overconfident statements are the very low base rates for the reported crime. Accusing an individual of crime solely on the basis of race leads to about 99.9% of false positives, for blacks.

The data for race and brain size usually indicate that American Negroids and Caucasoids do not much differ (Tobias, 1970, Herskovits, 1930). Both Negroids and Caucasoids residing in African countries (presumably exposed to infant malnutrition) have lower brain size. Beals. Smith, & Dodd (1984) have elegantly shown by correlational analyses of a very large computerized data bank of crania that the correlations found between race and brain size are spurious and exceeded by those of brain size to climatic zone.

Rushton's (1988) data for mental illness were already sufficiently criticized by Zuckerman & Brody (1988): hospital admission rates do not provide a proper epidemiological data and adequately designed epidemiological studies show no differences with respect to major psychiatric criteria (Robins et al., 1984). With respect to intelligence, Rushton overinterprets differences between blacks and whites on IQ tests as genetically given. There is a sufficient evidence that similar scores are changing at a rapid pace in developed countries (Flynn, 1987) and that the studies by hereditarians suffer from a multitude of methodological problems (Kamin, 1980; Taylor, 1980). In summary, Rushton's writings about human races are statistically unfounded.

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Table 1: Rank ordering of populations on various traits (from Rushton, 1988).

	Mongoloids	Caucasoids	Negroids
Intelligence			
Cranial capacity	1	2	3
Brain weight	1	2	3
Test Scores	1	2	3
Maturation rate			
Gestation time	?	2	1
Skeletal development	?	2	1
Age of walking	3	2	1
Age of first intercourse	3	2	1
Age of first pregnancy	3	2	1
Longevity	1	2	3
Personality and temperament			
Activity level	3	2	1
Aggressiveness	3	2	1
Anxiety	1	2	3
Dominance	3	2	1
Extraversion	3	2	1
Impulsivity	3	2	1
Sociability	3	2	1
Sexuality			
Multiple birthing	3	2	1
Size of genitalia	3	2	1
Secondary sex characteristics	3	2	1
Intercourse frequencies	3	2	1
Permissive attitudes	3	2	1
Social organization			
Marital stability	1	2	3
Mental health	1	2	3
Law abidingness	1	2	3