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Race Differences, Strategy Training, and Improper Inference

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An experiment involving a Group × Training or No-training design does not logically permit conclusions concerning the genetic or nongenetic causes of the main effect of the group differences or their interaction with treatments, nor can such a design reflect on the culture-fairness of the measuring instrument.

Even if the results of the experiment by Bridgeman and Buttram (1975) were highly significant and statistically unimpeachable (which they are not, see Humphreys, 1976), they could not logically support three of the main conclusions that the authors draw from their study.

Groups of white and black children who were given prior training in verbal strategies for solving nonverbal analogy problems showed a mean difference on a nonverbal analogies test less than half the size of the difference found between comparable groups of whites and blacks who had not received the training.

From this the authors concluded that (a) a genetic interpretation of the difference between the performances of the nontrained groups of whites and blacks "can be seriously questioned"; (b) "differences in *teachable* problem-solving skills contribute significantly to observed racial differences on nominally nonverbal tests"; and (c) "If teaching one cultural group a skill already learned by the other group causes a significant change in the relative standing of the two groups, the original test could not reasonably be portrayed as a culture-fair test of intelligence."

These conclusions rest upon certain implicit assumptions which were not examined by the authors or taken into account by their experiment. They fit the paradigm of a false syllogism.

> Group A acquires behavior X through training.
> Group B shows behavior X.
> ∴ Group B has been trained.

Or:

> Mr. A has acquired a fortune by hard work.
> Mr. B. has a fortune.
> ∴ Mr. B has done hard work.

Bridgeman and Buttram gratuitously assume that the white group had some kind of prior verbal strategy training outside the experimental situation that raised their nonverbal analogies test performance.

> Group A's skill in X is not improved by training in X.
> Group B's skill in X is improved by training in X.
> ∴ Group A was already at asymptote through prior training in X.

Logically, none of the conclusions in these syllogisms is at all warranted. If the authors had not implicitly posited prior differences in learning for whites and blacks, they would not have been so apt to draw the conclusions they did, for there is nothing in the logic of their experiment itself that warrants conclusions of any kind concerning racial genetic differences or the absence thereof.

The demonstration of a training effect on a particular behavior is not at all incompatible with a high degree of genetic determination of individual or group differences in the trait. But a Group × Treatment interaction may have important practical implications in its own right, regardless of the proportions of genetic and nongenetic variance. A French poodle that

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has been *trained* to retrieve in the water is not genetically the same as a Labrador retriever in water-going disposition.

Finally, the culture-fairness of tests is not assessed in terms of the degree to which subjects' performances on a test can be influenced by some form of training. Criteria of the fairness of a test when used in different groups involve such questions as whether there are significant differences in predictive validity for the two (or more) groups, whether the regressions of outside criterion measures on test scores have significantly different intercepts and slopes in the groups in question, and whether the test can be shown to measure the same theoretical construct (e.g., *g*) in both groups. A test may be judged as perfectly fair by all these criteria even if none of the variance in test scores is attributable to genetic factors.

At best, the design used by Bridgeman and Buttram could only demonstrate a Race × Treatment interaction. It could say nothing about the causes of the main effect of race or its interaction with treatment. But the search for cognitive training strategies that may generalize to a variety of other practical cognitive and scholastic tasks is a worthwhile enterprise in its own right. It should not be confused with the question of genetic and environmental contributions to variance.

References

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