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Inference and the Interpretation of Test Scores

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In his article entitled "The Test-Trait Fallacy," Tryon (May 1979) raises an important, and probably insufficiently examined, set of issues concerning test scores, trait inferences, and properties of persons. His central argument, as we understand it, questions the validity of the following syllogism: Test scores are trait measures; trait measures reflect basic properties of persons; therefore, test scores reflect basic properties of persons. This syllogism, Tryon asserts, constitutes the "test-trait fallacy." He goes on to discuss several alarming social implications of this presumed fallacy (e.g., sexism, racism) and proposes means of avoiding them (e.g., by treating test scores as dependent, rather than independent, variables in

research). We wish to respond to his paper by contending (a) that the syllogism criticized by Tryon is not logically fallacious, and (b) that the truth value of its premises is a matter for empirical validation.

A fallacy is defined as "an argument failing to satisfy the conditions of valid or correct inference" (*Webster's Seventh*, 1972). Since Tryon states the argument syllogistically (i.e., with premises and a conclusion derived from the premises), a logical fallacy seems to be implied. The syllogism in question is clearly valid by way of substitution: If A (test score) is B (trait measure), and if B (trait measure) reflects C (property of a person), then A must reflect C. We can detect no logical flaw in this syllogism. In this case it is wrong to allege a fallacy without showing the premises to be incorrect. Tryon's claim misleads the reader by presuming invalid from the outset precisely those assumptions whose truth or falsehood is at issue. In addition, the essential terms of the syllogism (i.e., *traits* and *properties of persons*) are undefined by Tryon, leaving the reader to wonder, (a) What *would* constitute a trait measure? and (b) What conditions *would* have to be met in order to consider something a basic property of the person?

Psychologists differ with respect to the role that inference should play in psychology. Tryon seems to endorse Anastasi's (1938) view that "psychology as an experimental science demands that we remain as close as possible to the objectively observable facts and that we define our concepts operationally" (p. 392). In contrast, Petrinovich (1979) argues that "psychology is historically (and necessarily, I would argue) involved in central, inferential conceptions. . . . One can ignore inferential concepts and remain at the level of behavior or of physiology, but one can never escape the fact that a full psychological explanation inevitably appeals to an inferential construct of some sort" (pp. 377-378). Regardless of one's preference to stay close to

"objectively observable facts" or to invoke "inferential constructs," inferences should not be dismissed solely because they are inferences. Rather, inferences should meet the demands of logic as well as the standards of empirical verification.

Tryon (1979) provides many examples of the "test-trait fallacy." For instance, he says that "it should also be emphasized that the unsound logic of drawing inferences about *ability* on the basis of observed *performance* is integral to the test-trait fallacy" (p. 402). If ability (cognitive, social, or even athletic) cannot be inferred from performance, then *no* inference concerning ability is ever possible. Tryon's preference to avoid inferences should be respected. It should be noted, however, that many psychologists (e.g., Petrinovich, 1979) view inference as central to the science of psychology. Tryon's use of such terms as *unsound logic* and *fallacy* to describe this inferential process is, at best, misleading.

If inferences *are* acceptable, the appropriate question becomes, Under what conditions can it be said that test scores reflect basic properties of persons? The answer hinges on what one considers a basic property. We see this as a crucial issue. Although Tryon (1979) provides no definition, he implies that a basic property must be physical or biological in nature (e.g., "a basic property of women, like having ovaries"; "part of being male, like having testes," pp. 404-405). For some psychologists, certain psychological processes or behaviors—for example, reflexes, cognitive styles, or even attitudes—might also constitute basic properties of a person. If basic properties are restricted solely to physical and biological entities, then the empirical question becomes, Do trait measures have observable physical or biological substrates? Research on this question is, of course, far from complete. Nevertheless, several studies have yielded positive results along these lines (e.g., Claridge, Canter, & Hume, 1973; Eysenck, 1967).

Whatever definition of basic property one chooses, we view the inference that test scores reflect such properties as an empirical issue amenable to confirmation or disconfirmation. The truth value of such statements should not be prejudged.

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Test-Trait Fallacies: Prison Style

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In a recent article, Tryon (May 1979) suggests that a basic flaw underpins a substantial block of the psychological enterprise. He indicates that researchers and clinicians alike are far too accepting of the "test-trait fallacy," in which a dependent measure (test scores) is quickly transformed to an independent causal variable. Explanatory constructs (traits) are highly valued by psychologists who subscribe to the stimulus-organism-response paradigm (is this a trait?). It is suggested that the technical requirements for establishing the presence of a trait (Fiske, 1973) have been conveniently bypassed.

While Tryon notes social consequences in the areas of employment and educational discrimination, it is also apparent that reified constructs

may be inappropriately used in prisons, especially in those that have limited program options and that maintain a heavy emphasis on categorizing, grouping, and segregating offenders. On the basis of testing and/or interviews, prisoners may be assigned to "protective custody," "maximum security," and the like. But the placement often comes to label the person, as in "he's a maximum security prisoner," for example. The inference that led to the original assignment has now become a trait. The prisoner simply "is." But is he? In my own experience in evaluating state prison systems as part of class-action litigation,¹ it has become apparent that several "system" variables greatly influence how prisoners are labeled. Megaprisoners with scarce work opportunities typically identify high percentages of prisoners "requiring" (notice the trait ownership) maximum security and protective custody. Conversely, it has been observed that when courts intervene to mandate classification procedures that are consistent with the principle of the least restrictive alternative, the number of prisoners found "eligible" for various programs and services suddenly increases (Fowler, Note 1).

Criminal-justice decision makers may be particularly susceptible to the test-trait fallacy. The sheer press to make predictions about offenders may encourage an eagerness to grasp various trait assumptions. In a recent report on the role of psychologists in the criminal justice system ("Report of the Task Force," 1978), an APA task force clearly recognized the inherent pressure to predict and suggested that "psychologists should be exceedingly cautious in offering predictions of criminal behavior for use in imprisoning or releasing individual offenders" (p. 1108). The argument is advanced on the basis of both our empirical track record and the ethical difficulty in presuming to reconcile individual and social "justice."

Correctional systems are just beginning to harness sophisticated as-

essment methods, and the relatively recent advent of psychologists into these areas, while potentially improving the methodological and technical aspects of assessment, may unfortunately give an exaggerated aura of science to the very heady business of predicting human behavior. This trend has placed us in a powerful and, at the same time, ethically awkward position. In some states, psychologists have a substantial voice in recommending parole, and in others, participation in psychological treatment is virtually required to be considered for early release. In at least one state, a prediction about recidivism is made at the time of an offender's initial classification, that is, during the first four weeks of incarceration. For purposes of the trait-fallacy argument, such early predictions are probably no more extravagant than predictions made near the end of a prisoner's sentence. The major ethical and legal difference, however, is that an offender's program and release date may be directly and disproportionately affected by this early prediction. The prisoner may thus be treated as a "high-risk recidivist" throughout incarceration. It is further noteworthy that we rarely attach probability statements to our predictions. To do so would require an accumulation of prediction studies that include cross-validation data (Gottfredson, 1970). Unfortunately, the prison enterprise rarely pursues this tedious process.

Perhaps the major source of error in offender predictions is an underlying assumption that criminality is a shared trait—that criminals constitute a homogeneous group. The pressure to make overreaching pre-

¹ Pugh v. Locke, 406 F. Supp. 318 (M.D. Ala. 1976), *aff'd in substance, sub nom.*; Newman v. Alabama, 559 F. 2d 283 (5th Cir. 1977), *cert. denied in relevant part, sub nom.*; Alabama v. Pugh, 98 S. Ct. 3057 (1978); Palmigiano v. Garrahy, 443 F. Supp. 956 (D. R. I. 1977); Trigg v. Blanton, No. A-6047, Memorandum Opinion (Chancery Court, Davidson County, Tenn., August 23, 1978).