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Operator Variation

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4-1 INTRODUCTION

Operator variation may be defined as divergence among operators in results of measurements made on the same materials by a given method and by a given instrument. There are two general kinds of divergence, and these may occur singly or together. The first is variation in reproducibility or precision, and the second is variation in estimated population means.

The first kind of operator variation, that of reproducibility or precision, results in differences in sensitivity of experimental work. The reason is that the difference among means required for significance decreases as the precision of the measurements increases. The second kind of operator variation, that of differences among operators in estimated population means, may cause no problem where only one operator is concerned and where only relative values are needed; however, where there are two or more operators, where absolute values are needed, or both, consistent differences among operators can be a cause of error, disagreement, and inconsistent interpretation.

For information and coverage of the literature beyond the brief account given here, the review by Griffiths and Rosenfeld (1954) should be consulted.

4-2 EXAMPLE

The two kinds of operator variation are exemplified by the data of Hardin (1952) in Table 4-1. The data are from a collaborative investigation of a method for determining fluorine in soil. Each collaborator received a sample of the same soil, together with detailed directions for

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