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D. Ulrich Greenwald
State University of Iowa

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A NEW TECHNIQUE IN THE TREATMENT OF ELECTRODERMAL RESPONSE DATA RESULTING FROM CONTINUOUS AFFECTIVE STIMULATION

D. ULRICH GREENWALD

I wish to discuss, first, a technique which we have evolved for classifying individual records of electrodermal response to a continuous affective stimulus situation and, second, the individual differences we found in terms of this technique.

The data upon which this work was done were obtained in the following way: By means of the Dermohmograph described at the last meeting of this society, continuous records of dermal resistance changes were obtained from 20 individuals, ten of each sex over a 40-minute period during which they watched a motion picture. Several days later a second record of equal length was obtained from the same individuals using another stimulus picture which was as nearly equivalent to the first as we could obtain. A group of graduate students served as observers; the theory being that if any real individual difference in electrodermal response appeared in such a mature group a true difference could be said to exist in the general population.

Though each record was unique in form, certain similarities were at once apparent. In determining the best method of treating these records statistically so as to preserve their differences and similarities, several methods previously used were tried and discarded. What we desired was a single numerical value to describe each record.

We first considered the average value of the electrodermal responses as an index since the mean is considered statistically the most stable of the measures of central tendency and also the most descriptive of any aggregate of discrete measures. But we found that the records also varied greatly in number of responses, the range being from 10 to 162 for one stimulus picture. This fact suggested that the number should also be used as a measure of individual difference unless it correlated well with the mean, in which case they would be equally descriptive measures. Such was not the case. Correlations between number of responses and the mean response were in the first picture $-.21$ and in the second $+.31$.

These correlations were low. We concluded that we were justified in using both measures in describing the data.

The standard deviations of the means were also calculated. These were found to be large in comparison with the value from which they were taken, thus showing considerable variability of response.

Having data from two experimental situations which we postulated as equivalent, that is, two similar stimulus pictures shown under identical conditions, we could test the reliability of each of these measures by correlation. These reliabilities were as follows:

Mean $r = .68$

S. D. $r = .61$

Number $r = .79$

None of these correlations were high enough so that the measure they represent could be used as a predictive index with any reliability. So, arbitrarily, we tried a combination value composed of the mean and number measures to see what reliability could be obtained. This combination was a simple division of the number by the mean.

With this quotient value, as we called it, a reliability of .92 was obtained. This was fairly high when one considers the many possible differences between the two experiments, namely, inequality of stimuli, change in attitude, different times of the day, chance individual variations, etc. To the best of our knowledge this higher correlation is not a statistical artifact but apparently is an inherent feature of this data. We worked for about two months checking this point and had the assistance of the mathematical department here. But we failed to discover any statistical reason why this treatment of the data should step up the correlation save the obvious fact that the number is weighted highly with respect to the amount of response in this quotient.

In terms of this quotient our adult observers showed individual differences ranging from 1.3 to 26.6 points. Further, inspection of the records showed that these quotients described them better than any other single figure we had obtained. On this basis then, from the standpoint of predictive value, and because of the range exhibited in a homogeneous group, this quotient, the number divided by the mean, seems to be worthy of further consideration as an index for use with electrodermal response records of a continuous type.

STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.