Proceedings of the Iowa Academy of Science

Volume 43 | Annual Issue

Article 123

1936

TIme Characteristics in the Word-Association Test

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326   IOWA ACADEMY OF SCIENCE   [Vol. XLIII

PITCH PERCEPTION OF FREQUENCY GLIDES

Don Lewis and Grant Fairbanks

A rising or falling frequency glide at the end of a sustained tone is perceived as being of greater extent and longer duration than the identical physical phenomenon occurring at the beginning of the tone. This is true for both complex and pure tones, with intensity constant or varying.

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PITCH AND INTENSITY CHARACTERISTICS OF AMERICAN DRAMATIC SPEECH

J. M. Cowan

Physical analyses of these factors are presented in the form of a graphical speech score. A simultaneous presentation of recorded speech and scores will be made.

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TIME CHARACTERISTICS IN THE WORD-ASSOCIATION TEST

Harold M. Williams

It has been repeatedly demonstrated that the word-association test empirically differentiates normals from delinquents and psychopaths, as well as a state of emotional calm from one of apprehension in a given subject. It is still relevant, however, to inquire more deeply, if possible, into the psychological nature of the process.

Obviously, this inquiry should be made on a very broad basis. Time limitations make it necessary, however, that this report be restricted to an examination of one line of evidence only, namely association time.

If a large number of stimulus words is given any subject (in the present case, the Kent-Rosanoff list), there results a series

of time values for the responses. The present problem is the analysis of the nature of the distribution of times which appear characteristically under these conditions.

Let us consider first certain types of distribution which could appear, making from each the most reasonable inference regarding the nature of the process which would produce such a distribution.

1. The distribution could be dichotomous. Under these circumstances, it would be reasonable to infer that two sharply but one function was discovered which is an extraordinarily close fit as is shown by the crosses in Chart III. The equation of this line, calculated from two points is, in x and y,

$$y = 1.8867 - .4849\ x$$

In this equation, $y = \log$ T-score and $x = 1/\text{time}$. By substitution and transformation we have then, in terms of T-score and time,

$$\text{T-score} = \frac{77.05}{(3.056)\ 1/\text{time}}$$

From this equation, a series of empirical T-scores for equal time intervals can be calculated, for the purpose of determining goodness of fit. These values are shown by the circles in Chart III, and lie so close to the theoretical values that the Chi-square test seemed unnecessary.

There remains, then, the problem of interpreting these findings psychologically. According to the present interpretation, there appears to be in behavior on the test something of a combination of the compound interest law and the reciprocal law. The function is continuous in the sense that whatever is operative in any single reaction is operative in all. This process, however, does not vary normally, but rather proportionally with respect to the total time. If the process which demands time is emotional tension, we would have to assume it to be present in all reactions, becoming increasingly great, however, with lengthened time.

To use the normal law in the interpretation, however, we must postulate further that time is an indirect (reciprocal) measure of the process, the true variable being velocity. Within differentiated processes were present.

2. Assuming some variability in both processes, a transitional type might appear. The outstanding characteristic of this type would be the definite appearance of more than one mode in the distribution.

3. The distribution might be normal. In this case, the most reasonable inference would be that a single continuous process

was involved, this process being determined by chance combinations of a large number of equal and independent factors.

4. The distribution might be skew. It might, however, still represent homogeneous material, the asymmetry being due to other causes, two of which will be discussed later in the paper.

Empirically our results are very clear and extremely consistent. Chart I shows the characteristic curves for equal time categories of 50 normal and 50 delinquent adolescents. The curves are smooth and continuous, showing fair contact at the lower end, a single definite mode, and a very long tail with high contact at the upper end.

The curves are obviously not normal, not dichotomous, and not bimodal with respect to time, and interpretations other than those given for these types must be sought.

In the further analysis it was decided to determine whether the present distributions were related to the normal in some way not immediately apparent. Preliminary guesses were made along the lines followed by two previous investigators. Thurstone[1] has shown that, if Weber's law is operative within the range of stimuli used in an experiment in psychophysics, the proper relation of discrimination to the physical stimulus is not phi-gamma, but phi-log-gamma. The other suggestion came from studies by McCloy[2] of certain physical tests where time is the measure of achievement. He has shown that in many cases it is better to think of the true variable under consideration as being the velocity or speed of behavior, time being an indirect measure of this, i.e., its reciprocal.

One convenient way to study these relationships is to reduce the relative frequencies in each time category to T-score values by McCall's method. If the data vary normally with respect to time as such, a Cartesian plot of T-score against time values will be linear. Furthermore, when an equation involving these two variables is found to reduce the plot to linearity, this equation can be taken as the expression of the relation the given distribution bears to the normal.

The plot of T-score against absolute time is curved and logarithmic in general appearance as is shown in Chart II. A number of functions give a better approximation to a linear plot, these restrictions we need only to assume the normal law to account for the form of the distributions obtained. In restatement, it might

[1] Thurstone, L. L.: The Phi-Gamma Hypothesis. J. Exper. Psychol., 11, 1928, 293-305.
[2] McCloy, W. H.: The Measurement of Athletic Power. A. S. Barnes, 1932, Pp. 23.

be concluded that the velocity of association in this type of test varies normally, — within the restriction, that inhibition varies proportionally with time.

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THE ORGANIZATION OF FUNCTION IN THE DELINQUENT

NEWELL C. KEPHART

The thesis in this study was that juvenile delinquents display personality defects which may be described as disorganization of the mental data. Such disorganization is thought of as a disconnectedness between the elements of the psychic material. It is thought that delinquent subjects as a group will give evidence in performance of less dynamic dependency amoung these data than will non-delinquent subjects as a group.

It was thought likely that evidence of disorganization would appear wherever a mental process which usually flows smoothly may be measurably disturbed in the direction of less smoothness. In any process requiring the use of many elements, smoothness of the process might depend in part at least upon the degree of connectedness between them. Two such processes have been chosen for investigation. The smoothness of flow of the processes required in verbal association has been investigated by means of the association-motor technique.

The subjects in this part of the study were 47 randomly selected delinquent boys at the Iowa Training School for Boys who were tested within two weeks of their admittance to the school. This delinquent group was compare with a non-delinquent group of 39 subjects of similar age and grade range selected at random from the school population of an Iowa city. The data indicate an increase of the delinquent group over the control group in mean score. The mean of the control group was 215 while that of the delinquent group was 412. The difference between these means is 11.1 times its probable error. This would indicate that there is a statistically significant difference between the mean scores of these two groups.

Smoothness of flow of mental processes was further investigated