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## THE MEASUREMENT OF AGGRESSIVENESS

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The term aggressiveness, as here used, is synonymous with personal force, initiative, assurance. It is thus understood as standing for that trait which in combination with intelligence and reliability goes far towards completing the essential personal requisites for success. Translated into the terminology of McDougall it is equivalent to an abundance of self-assertion and pugnacity, and a minimum of fear. Described behavioristically it is invariably contrasted with the attitude of inferiority or submission.

While we may never find exactly the same pattern of aggressive behavior in any two individuals, there is nevertheless a widespread and reasonably established belief that one generally knows what to expect of the aggressive man in most of the ordinary circumstances of life. He is more likely to be vigorous, positive, and masterful than the man lacking in this trait; and he is less likely to shrink from notice, to avoid argument, to display a lack of "nerve." Generally speaking his chances of success in any type of undertaking are higher than those of the average man. Undue aggressiveness may handicap personal progress in a certain number of cases, but it is probably not so much the excess of personal force as the lack of tact and sympathy that is the drawback in such cases. So we may say with only slight qualification that, other things being equal, the measure of a man's aggressiveness is the measure of his chance of success.

The laboratory tests of aggressiveness here reported are to some extent the outgrowth of the instinct-emotion tests reported previously in the *American Journal of Psychology*<sup>1</sup>

<sup>1</sup>"A Method of Testing the Strength of Instincts." *A J P* April 1916, 227-33, and "Laboratory Tests of Fear. Anger and Sex Interest." *A J P*. July 1917, 390-5

But the method of attacking the problem is fundamentally different. The first step in the present experiment was to find two groups of subjects who contrasted to a marked degree in the trait in question. This condition was met by taking from a class of 89 students the highest and lowest fifteen per cent as rated on aggressiveness. This gave thirteen men in each group. Reliable ratings of these men were obtained only after much labor, but it is believed that the method used is quite satisfactory for the present purpose, namely that of guaranteeing a marked difference in aggressiveness between the highest and lowest groups.

The rating of each man was determined by averaging two types of estimates, those made by the faculty and those made by fellow students. In order to secure standard faculty ratings the department of psychology proposed to the faculty a general system of personal ratings of the students. The plan which was adopted is similar in many respects to the officers' ratings used in the army. At the end of the college year each instructor files in the office of the Registrar a rating sheet containing his personal estimates of the men under his instruction. The estimates are made on a scale of five letter grades, as in the case of scholarship marks, and the traits judged are intelligence, aggressiveness, reliability and personality, all of them carefully defined on the rating sheets provided for each instructor. To offset the possibility of perfunctory and therefore careless ratings the point is stressed that no instructor shall under any circumstances submit any ratings which fail to represent a reasonable amount of confidence on his part. It is urged that where it is impossible for a real judgment to be formed, a blank is to be preferred to a forced opinion. Conformably to the above plan the Dartmouth faculty submitted in June 1920 personal data concerning 1,480 students. Practically all the men in the class of 89 students from whom the subjects for the experiment were to be taken were rated by from three to five of their instructors.

Student ratings were similarly obtained from the members of the class. Each student was asked to rate those of his fellow students whom he knew particularly well. From the averages of the faculty and student ratings the list of the thirteen most aggressive and the thirteen least aggressive men was now determined. After making all possible allowance for individual inaccuracies of rating, it seemed absolutely certain that the thirteen highest men, taken as a group, were conspicuously more aggressive for any purpose whatsoever than the lowest thirteen men. As corroborative of this it is

worth mentioning that the thirteen highest men included the president of the senior class, the business manager of the college daily, the manager of track athletics, the quarterback of the football team, the president elect of the Outing Club, and an officer of the Dramatic Association prominent in the production of student plays. The lowest thirteen men were decidedly without prominence in college activities.

To be sure, a certain amount of the difference between the two groups is to be attributed to the factor of intelligence, and indeed this factor can never be completely isolated in any study of personal differences. But an examination of the intelligence ratings and the scholarship marks of the two groups here studied shows that they differ by far less in respect to intelligence than in respect to aggressiveness. If the selection had been of the highest thirteen men in the class on the basis of intelligence ratings, only four of our most aggressive men would have qualified, and one of them would have been included in a list of the thirteen least intelligent. As against this we have the fact that five of the least aggressive were also rated among the thirteen least intelligent, and none of them among the thirteen most intelligent. The average of the scholarship marks of the thirteen most aggressive men is 2.5 on a scale of 4.0 as the maximum. This is about .3 of a point higher than the general average of the college. The average of the thirteen least aggressive men is 1.7, about .5 of a point lower than the college average. There is then a real difference in intelligence in favor of the most aggressive group, almost necessarily so, but it is not to be compared with the difference in aggressiveness. Not one of the highest group had an average rating of less than B on aggressiveness, and not one of the lowest group had an average rating of more than D on the same trait.

Having thus found two groups who differed in nothing so much as in aggressiveness, the next step was to try our tests which seemed calculated to give marked and consistent differences of results for the most and the least aggressive groups. The assumption was that such tests would have considerable significance as affording a measure of the trait. It was hardly to be hoped that any single test would show a point for point correspondence with the existence of the trait,—though the eye movement test does almost approximate such a correspondence. But the expectation was that a grouping of several significant tests would offer a highly suggestive picture of the trait in a given individual,—an aggressiveness profile,—to use Downey's expression.

TABLE I  
EYE MOVEMENT TEST

	Name	No. of Eye Movements	
Most Aggressive . . . . .	C.N.	0	Total 6
	Z.J.	0	
	A.C.	2	
	R.M.	1	
	N.A.	0	
	J.G.	1	
	E.B.	0	
	B.W.	0	
	R.W.	1	
	H.C.	0	
	A.J.	0	
	E.L.	1	
D.R.	0		
Least Aggressive . . . . .	H.M.	7	Total 72
	J.J.	1	
	E.R.	4	
	W.P.	4	
	N.F.	4	
	P.G.	5	
	F.B.	7	
	J.N.	0	
	G.D.	5	
	R.B.	16	
	S.H.	0	
	R.T.	5	
B.R.	14		

## I

## EYE CONTROL IN PERSONAL INTERVIEW

Common sense has it that the shifty eye is generally a sure sign of personal weakness, if not of downright dishonesty. The first test was designed with a view to bringing this element of behavior into quantitative relation with the trait aggressiveness. Each of the twenty-six subjects was required to perform a somewhat difficult series of mental additions while constantly returning the fixed gaze of the instructor who sat facing him. The addition series were standardized as to difficulty as described in test II, and the subject performed

them with the knowledge that accuracy and speed were essential. But he was emphatically instructed that under no circumstances should he let his gaze wander from that of the man facing him, as all movements of the eyes were to affect his score seriously.

The details of the addition series are described in the following test. The record for each subject is the total number of eye movements recorded against him during five series of additions. Table I gives the records of the twenty-six subjects.

It will be seen that a total of 72 movements are recorded against the least aggressive as compared with 6 against the most aggressive men. Not one of the aggressive group averted his gaze more than twice during the five series of additions, whereas ten of the thirteen least aggressive subjects shifted their eyes four times or more. If a steady eye does not positively guarantee the presence of aggressiveness, as may be judged by the fact that three of the least aggressive subjects were able to maintain practically constant fixation, a marked lack in this respect is almost invariably accompanied by a lack of aggressiveness.

The question naturally arises whether eye control in personal interview is not perhaps more a matter of "reliability" than of aggressiveness. To test this point the thirteen most reliable and the thirteen least reliable men in the class, as determined by faculty ratings, were submitted to the same experiment. Eight of the thirteen "least reliable" were able to keep within a limit of two eye movements, and the total of the thirteen subjects was 41 movements as compared with 72 for the thirteen least aggressive. Six men were common to the two groups, which would indicate a fairly high correlation between the two traits, but the record for eye movements evidently points to a much more definite relation between eye control and aggressiveness than is the case with reliability.

Whether we compare the average number of movements of the aggressive and the unaggressive subjects, or compare the number of subjects in the two groups who lost control to the extent of making two or more eye movements, we find evidence of at least ten times as much control in the upper group as in the lower. Thus the simple behavioristic fact of the ability to look another person in the eye seems to have such a high significance regarding the presence or absence of aggressiveness as to warrant giving it an extremely prominent place in any scoring method devised as a measure of this trait. The correspondence is in fact so close as to justify the generalization that a stop watch and a pair of fixed eyes are the

only indispensable laboratory equipment necessary for estimating roughly the degree of aggressiveness in at least four-fifths of the subjects

## II

### FEAR DISTRACTION TESTS

The purpose of the distraction tests was to determine how far the ability to resist a type of distraction involving a certain element of fear is related to the possession or lack of aggressiveness. Preliminary to all of these tests each subject was required to practice fifty times performing mental additions according to a uniform plan involving constant increments of one, through a series of nine additions. If such a series began with 36, it would continue; 37, 39, 42, 46, 51, 57, 64, 72, 81. If it began at 29, it would continue; 30, 32, 35, 39, 44, 50, 57, 65, 74. Thus a series might begin with any number and would consist of nine additions, the numbers added being; 1, 2, 3, 4, 5, 6, 7, 8, and 9. On the day prior to the experiment each subject had practiced such additions with fifty series. This amount of practice seemed to bring each man reasonably near to the limit of his natural ability at such a task. The thirteen most aggressive subjects were able after this amount of practice to perform ten series of additions under normal conditions at an average time of 12.6 seconds. The thirteen least aggressive subjects averaged 15.6 seconds for the same ten series under normal conditions. The median of the thirteen mean variations for the normal series of the aggressive subjects was 20 seconds; that for the least aggressive subjects was 23 seconds. The difference in the normal variability of the two groups was thus negligibly small. In the comparison of any two individuals the factor of normal variability in the addition series will have to be taken into account, but for purposes of comparing these two groups as a whole it is of less importance.

### DISTRACTION BY STARING

Immediately after the ten normal series were completed the subjects were asked to perform the same task under conditions of slight emotional distraction. The first of these distractions was that of having to meet the fixed gaze of the instructor facing the subject, as described in the eye movement test. This distraction record is in fact the time record which was obtained simultaneously with the eye movement score. While one experimenter counted the eye movements which gave the

record for Table I, another timed the five series of additions performed under these conditions. The average increase of time as compared with the normal average is obtained as the measure of the subject's distraction. Table II gives the results for this test.

TABLE II  
DISTRACTION TEST—STARING

	Name	Time Increase With Test	A D. Without Distraction	No of Cases in which Distraction Time is Greater Than A.D.	
Most Aggressive	C.N	-1 9	6		
	Z.J.	4	2 3		
	A.C.	4	2 8		
	R.M.	- 1	2 0		
	N.A.	3 0	1 3	1	
	J.G.	- 4	2 5		
	E.B.	5 1	1 2	1	
	B.W.	- 1	3 5		
	R.W.	0	8		
	H.C.	5	2 8		
	A.J.	9	2 5		
	E.L.	2 9	1 0	1	
	D.R.	-1 4	1 3		
					Total 3
Least Aggressive	H.M.	9.7	2 5	1	
	J.J.	1 4	3 5		
	E.R.	5 3	2 7	1	
	W.P.	2 5	2 1	1	
	N.F.	- 5	2 3		
	P.G.	- 6	1 8		
	F.B.	4 9	2 4	1	
	J.N.	-2 0	2 6		
	C.D.	- 3	1 5		
	R.B.	2 8	1 4	1	
	S.H.	4 8	1 5	1	
	R.T.	5 0	4 2	1	
	B.R.	8 9	2 0	1	
					Total 8

The most aggressive subjects are listed in the upper half of the table, and the least aggressive subjects in the lower half. The first column of numbers shows the average amount of time increase of each subject under the distraction conditions, as measured by comparing the average time for the five staring tests with the average time for the ten normal trials. When

the time made in spite of distraction was more rapid than normal, this is indicated by a minus sign before the number. The middle column gives the average deviations for each subject in the normal series, and the right hand column indicates the cases in which the amount of time increase under distracting conditions was greater than the average deviation under normal conditions. The results may be summarized as follows: for the aggressive subjects the staring caused an average delay of .4 of a second; for the unaggressive subjects it caused an average delay of 3.2 seconds. Only three of the aggressive subjects were delayed by an amount equal to their average deviations under normal conditions, whereas eight of the unaggressive subjects have a distraction time greater than the A. D. The results indicate therefore approximately three times as much probability that an unaggressive person when stared at will be deterred to a considerable degree than that an aggressive person will be thus delayed.

#### DISTRACTION BY ELECTRIC SHOCK

In the second of the three distraction tests the element of distraction was the expectation of an electric shock which was to come during or at the end of each of the five series of additions. The subject was told that he would receive shocks, which might be of any intensity from 75 to 220 volts, and which might be expected at any time during or between the addition series. Actually he was not given more than 75 volts at any time, and the shock was always given just as he was finishing his last number in a series, so that the distraction was almost wholly imaginary rather than sensory.

The accompanying picture shows the apparatus used in the shock test.

The base of the apparatus consists of a 9 by 18 inch board, divided into two square sections by a board upright 5 inches high. An electric light plug and five sockets, fitted with 60 watt lamps, are on one side of the partition. The sockets are interconnected by a combination of series and parallel wiring. On the other side of the partition are a small voltmeter and two binding posts. The voltmeter and the posts are connected to the lamp sockets by four wires running through the partition. Two brass hand electrodes are connected one to each binding post. By tightening or loosening certain lamp bulbs a difference of potential of 75 or 220 volts can be sent either through the meter, or to the electrodes, or to both. The lamps, of course, are lighted whenever they are thrown in the circuit,



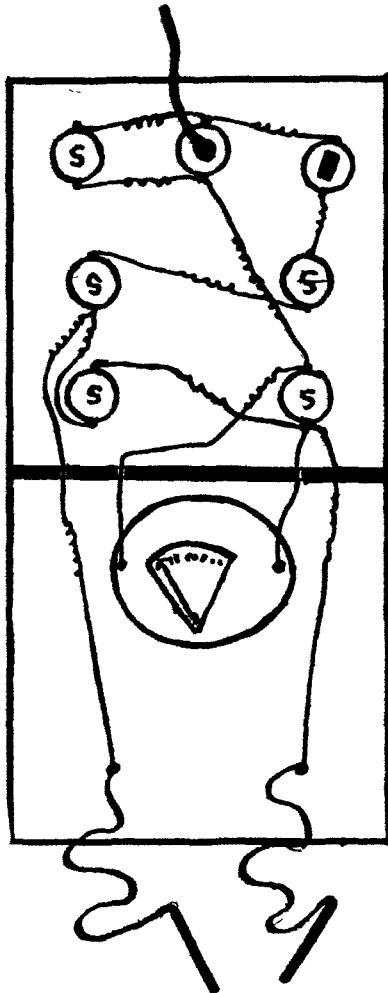
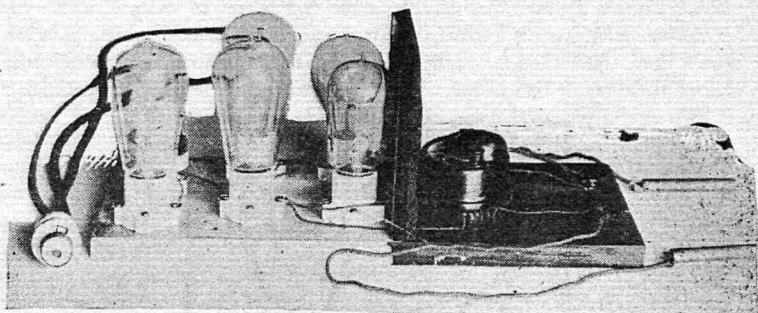


Diagram Showing Wiring for the Electric Shock Apparatus.



Electric Shock Apparatus

but they are partially shielded by the partition, and carbon lamps are used so as not to produce a bright distracting light.

The subject is seated by a table on which the apparatus rests. The experimenter hands the subject the electrodes and says: "This is an electric apparatus. As you begin your additions I shall begin manipulating these light bulbs. When I loosen or tighten certain bulbs you will receive an electric shock. It may be weak or strong. It is not dangerous, but may be very uncomfortable. Just to show how it feels I will give you a weak shock. Watch the pointer on the voltmeter." The subject is then given a shock of 75 volts. The electrodes are laid on the table, and the subject is asked to watch the voltmeter while another manipulation sends 220 volts through it. He is again told to take the electrodes in hand, and the test begins. The experimenter continually manipulates the bulbs during the adding, and just at the last addition in each series the subject receives a shock of 75 volts. No shock is given during the adding, but the subject is continually in a state of expectancy. Each subject is bound by a promise of secrecy regarding everything about the experiment. The tests were completed in two days and no subject had any knowledge further than that there was to be some kind of electric shock.

The results are given in Table III, and according to the tabular scheme already described for Table II.

The figures for time increases in the left hand column show that five of the aggressive subjects resisted the distraction with complete success, whereas all of the twelve, unaggressive subjects were positively affected to the extent of an increase of 2.5 seconds or more. The average shock-delay of the least aggressive subjects was 6.1 seconds as compared with

TABLE III  
DISTRACTION TEST—SHOCK

	Name	Time Increase With Test	A.D Without Distraction	No of Cases in which Distraction Time is Greater Than A.D.	
Most Aggressive	C.N.	2 9	6	1	
	Z.J.	2 5	2 3	1	
	A.C.	10 0	2 8	1	
	R.M.	3 0	2 0	1	
	N.A.	4 8	1 3	1	
	J.G.	5 8	2 5	1	
	E.B.	3 9	1 2	1	
	B.W.	-2 3	3 5		
	R.W.	4	8		
	H.C.	0	2 8		
	A.J.	- 9	2 5		
	E.L.	8 0	1 0	1	
	D.R.	- 4	1 3		
					Total 8
Least Aggressive	H.M.	10 1	2 5	1	
	J.J.	9 9	3 5	1	
	E.R.	6 0	2 7	1	
	W.P.	17 1	2 1	1	
	N.F.	3 3	2 3	1	
	P.G.		1 8		
	F.B.	2 5	2 4	1	
	J.N.	2 6	2 6	1	
	G.D.	4 7	1 8	1	
	R.B.	5 5	1 4	1	
	S.H.	3 8	1 5	1	
	R.T.	2 9	4 2		
	B.R.	4 7	2 0	1	
					Total 11 (One score missing)

an average of 2.2 seconds for the aggressive group. The individual variations among the aggressive subjects seem to indicate that this test has a less specific relation to aggressiveness than does the staring test, and this is somewhat borne out by the fact that when the same test was given to the thirteen most reliable and the thirteen least reliable men in the class, the difference was by far more striking than for the aggressiveness groups. Only one of the thirteen "most reliable" men had a shock-delay of more than three seconds, whereas eleven of the thirteen "least reliable" men had delays upwards of three seconds. However, the fact that the ability to with-

stand shock distraction is possessed by 40 per cent of the aggressive subjects and by none of the unaggressive ones justifies the inclusion of this test as having considerable symptomatic value regarding the trait.

#### DISTRACTION BY SNAKE

In the third test the method of distraction was to place a dead snake, suitably coiled, and pinned to a cork board, about ten inches in front of the face of the subject during one-half of his adding. Only one series of additions was recorded for this test, as it was found that adaptation was very rapid. This means, of course, that the results have a larger probable error than those recorded for the other types of distraction. The detailed record is given in Table IV.

TABLE IV  
DISTRACTION TEST—SNAKE

	Name	Time Increase With Test	A.D. Without Distraction	No. of Cases in which Distraction Time is Greater Than A.D.	
Most Aggressive	C.N.	9.1	6	1	
	Z.J.	4.4	2.3	1	
	A.C.	6.6	2.8	1	
	R.M.	2.7	2.0	1	
	N.A.	3.6	1.3	1	
	J.G.	10.6	2.5	1	
	E.B.	7.7	1.2	1	
	B.W.	4.3	3.5	1	
	R.W.	1.4	.8	1	
	H.C.	— .5	2.8		
	A.J.	4.3	2.5	1	
	E.L.	5.9	1.0	1	
	D.R.	0	1.3		
					Total 11
Least Aggressive	H.M.	9.7	2.5	1	
	J.J.	11.4	3.3	1	
	E.R.	12.6	2.7	1	
	W.P.	1	2.1		
	N.F.	1.1	2.3		
	P.G.	9.8	1.8	1	
	F.B.	21.7	2.4	1	
	J.N.	.8	2.6		
	G.D.	8.7	1.8	1	
	R.B.	11.6	1.4	1	
	S.H.	3.2	1.5	1	
	R.T.	7.0	4.2	1	
	B.R.	9.5	2.0	1	
					Total 10

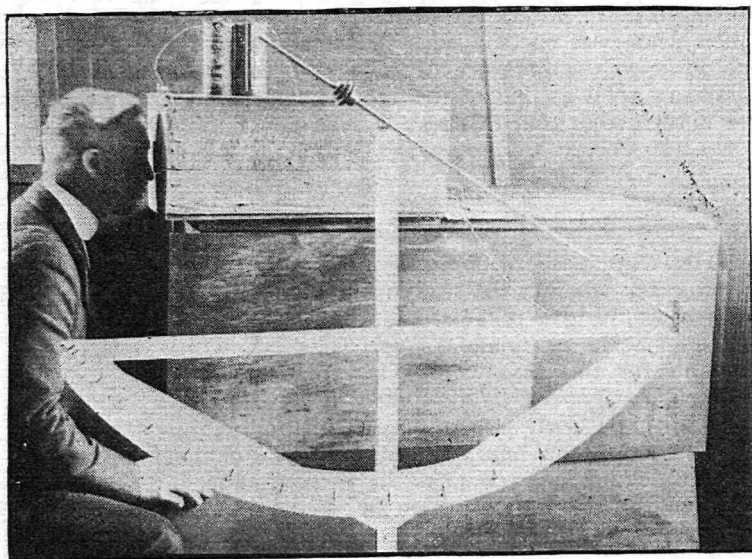
The time increase for practically all of the subjects was greater than the average deviation in the normal series, but the average delay of 8.2 seconds for the unaggressive subjects was practically double the 4.6 seconds for the aggressive ones. The most noticeable fact here was the greater liability of the unaggressive subjects to become somewhat panicky. Generally a delay of nine seconds or more was accompanied by very definite movements of withdrawal or avoidance, and it will be seen from the figures in the first column of the table that eight of the unaggressive men were delayed by nine seconds or more, as compared with only two of the aggressive men who were so delayed. The unaggressive man's liability to panic in the presence of a snake seems to be about four times as great as that of the aggressive man. It is interesting to note further that this test showed no relation to reliability.

### III

#### WORD ASSOCIATION TESTS

The word association tests were designed with a view to finding out whether the study of responses to selected stimulus words would give reliable data for the differentiation of men as aggressive or unaggressive. The six words selected as stimuli for this test were: 'enterprise,' 'success,' 'danger,' 'death,' 'opponent,' and 'company.' 'Enterprise' and 'success' seemed likely to contain positive and definite suggestions for the aggressive man, and 'death' and 'danger' to be more full of definite suggestions to the weaker subjects. 'Opponent' offered the concrete situation of personal contest, and 'company,' being adapted to so many possible meanings, seemed suited to the purpose of uncovering the readier tendencies in the mind of the subject.

Apparatus. The use of a lip key or similar recording device in circuit with a chronoscope was soon found unsatisfactory on account of the frequency with which the subjects tended to make lip movements, or even to begin to vocalize, before they were actually ready with a response. Whenever this occurred, it meant not only that the time record was spoiled, but that the stimulus word could never be given to that subject again under the original conditions. Moreover, oral presentation of words proved somewhat unsatisfactory on account of the possibility of slight misunderstandings, and the slight variations in emotional suggestion on the part of the experimenter. The apparatus finally constructed is shown in the accompanying picture.



Word Exposure and Association Time Apparatus

It consists of two main parts, the timing apparatus and the exposure box. The first of these consists of a standard, a pendulum, and a graduated metal arc. The standard is 42 inches high and supported by a base. The pendulum is a metal rod, 40 inches long, and is attached 10 inches from one end to the top of the standard. The shorter end of the pendulum is weighted so that it will make a half swing in exactly one second. The metal arc is one-fifth the length of the circumference of the pendulum swing. It is attached to the standard, one half on either side, just back of the path of the end of the pendulum. The arc is graduated so that time may be measured to within 5 hundredths of a second from the pendulum swing.

The exposure box is 10x12x20 inches and is closed except for a 2x4 inch opening at one end and a 1x2 inch opening at the other. From a revolving spool, attached just above the smaller opening, a sheet of paper 2 inches wide and 70 inches long extends to another similar spool just under the opening. The paper may be wound from one spool to another by means of handles attached to the spools. A piece of metal fits over the paper in front of the opening of the box so that it excludes all light. The stimulus words are arranged about an inch apart on the strip of paper, and by proper adjustment of the spools any word may be made ready for the exposure which is to result from the closing of the light circuit. For this purpose two 6 candle power lights are provided, one at either side of the larger opening of the box. These are wired in series with a battery and connected with the catch which suspends the pendulum in such a way that the moving of the catch to release the pendulum closes the light circuit, and thus exposes the stimulus word to view.

The subject sits with his eyes close to the larger opening of the exposure box, looking towards the paper about to be exposed at the other end of the box when the light connection is made. When the lights are not on, the box is dark, and the word on the paper is therefore not visible. The subject is given instructions to look for the word that is to be exposed, and to respond as quickly as he can with the first word that he can associate with it. A second experimenter watches the pendulum, and by noting the position of the pendulum on the graduated arc at the moment of the response, he is able to record the time to within 5 hundredths of a second.

The two sources of error in determining word reaction time by this method are: (1) the auditory reaction time of the second experimenter and (2) the errors in reading the swing

of the pendulum from the graduations of the arc. The first of these is probably very nearly constant for the same experimenter throughout a series of observations. The latter error may be in either direction but is seldom more than 5 hundredths of a second. In general the time records here presented are a small fraction of a second too long. But as this tendency is constant in all the records, and the method offers the subject no possible way of stealing a march on the experimenter, it seems highly satisfactory.

The results of the association experiment are set forth in Table V.

The six stimulus words are indicated in the horizontal line at the top of the table. Each subject's responses to the six words are given after his initials. Just above each of the response words is a large number on the right which indicates the time record in hundredths of a second. The small number just above the response word shows the frequency with which that response was given when the experiment was repeated with 78 subjects. Twenty-two of the original twenty-six subjects were available for this experiment. The upper part of the table contains the results for the eleven very aggressive subjects, and the lower half the results for the eleven least aggressive ones.

There is evidently a significant difference between the two groups in the character of the words chosen. In response to the words 'enterprise' and 'success' the aggressive subjects are almost always definite and positive. Of their twenty-one responses fourteen are decidedly colorful;—'initiative,' 'push,' 'money' twice, 'activity,' 'scheme,' 'undertake,' 'ambition,' 'power,' 'gain,' 'win' twice, 'wealth' and 'advance.' Five responses were sufficiently general to be classified as of doubtful significance;—'building,' and 'business' four times. One was apparently based on verbal similarity;—'success'—'successful.' Only one response;—'failure' was negative. The twenty-two responses of the eleven least aggressive men to the same two words were strikingly different. Only three were positive and colorful;—'work' and 'ambition,' the latter occurring twice. Twelve are doubtful, colorless, or passive;—'physics,' 'American Magazine,' 'oil,' 'friends,' 'good,' 'college,' 'happiness,' 'business' four times, and 'industry.' The negative response;—'failure' occurred four times. Briefly, there is four times as much probability of a definite, forward-looking response to 'enterprise' and 'success' from the aggressive man as from the unaggressive. Furthermore, there is



TABLE V  
MOST AGGRESSIVE SUBJECTS

Name C.N	Stimulus Words					
	Company	Enterprise	Opponent	Success	Danger	Death
	5 400 army	1 140 initiative	1 260 box	1 290 power	34 150 fear	1 275 cotton
Z.J	1 220 battery	2 175 building	26 135 enemy			1 135 living
A.C.	3 200 girl	22 105 business	1 255 politics	2 170 money	2 95 dread	33 175 life
R.M.	1 190 friendly	1 190 push	2 400 hatred	2 135 gain	34 100 fear	33 130 life
N.A.	3 200 girl	2 140 money	2 175 opposite	3 200 win	34 135 fear	3 140 die
J.G.	2 130 people	1 130 activity		1 135 wealth	34 135 fear	11 230 fear
E.B	2 200 alone	1 310 scheme	26 200 enemy	3 210 win	2 150 dread	33 115 life
R.W	1 130 association	2 100 undertake	7 95 foe	1 200 successful	34 95 fear	2 135 death
H.C.	2 210 business	22 95 business	1 300 war	1 250 advance	34 175 fear	11 340 fear
A.J	1 130 insurance	22 130 business	26 195 enemy	5 140 business	1 200 car	33 155 life
E.L	2 135 society	4 180 ambition	1 130 adversary	25 135 failure	8 150 safety	133 100 life

LEAST AGGRESSIVE SUBJECTS

H.M.	1 145 good	22 145 business	26 155 enemy	1 420 Arre Mag	2 210 red flag	2 155 grave
J.J.	2 150 people	1 160 enterprise	26 160 enemy	2 130 happiness	8 200 safety	33 140 life
E.R	2 120 group	4 140 ambition	9 160 fight	2 200 succeed	2 400 death	11 140 fear
W.P	3 100 girl	1 280 oil	2 85 football	1 140 college	1 135 money	1 115 killed
N.F	2 115 alone	1 495 encounter	2 100 antagonist	5 300 business	2 430 act	2 130 birth
F.B	2 200 man	22 235 business	3 200 man	2 240 good	2 150 red flag	1 150 man
J.N	5 200 army	1 400 work	26 200 enemy	25 95 failure	1 320 enemy	33 160 life
G.D	9 145 friend	3 135 industry	9 150 friend	25 150 failure	1 300 fly	33 100 life
R.B	6 230 friends	22 230 business	26 140 enemy	1 180 friends	34 95 fear	3 285 funeral
S.H	6 105 friends	1 250 failure	8 130 friend	25 115 failure	34 145 fear	33 120 life
R.T.	1 400 Ford	4 330 ambition	1 300 hardware	1 240 physics	34 160 fear	1 190 accident

only one fourth as much probability of his giving a negative response, such as 'failure.'

Almost as clear cut is the difference in the character of the responses of the two groups to the words 'danger' and 'death.' In this case the aggressive responses are mostly very general and commonplace, while those of the unaggressive are more concrete and vivid. Of the twenty-one responses of the aggressive subjects only three seem to indicate anything resembling a vivid, personal experience. These words were 'car' and 'dread,' the latter occurring twice. The response 'cotton' to the stimulus word 'death' is doubtful, and the remaining seventeen are either so common as to be meaningless, or else are mere verbal variations of the stimulus word;—'life' five times, 'fear' seven times, 'safety,' 'die,' 'death.' By contrast, the unaggressive subjects present at least 10 out of 22 responses which are colorful and suggestive of personal interpretation;—'money,' 'fly,' 'act,' 'enemy,' 'red flag' twice, 'grave,' 'killed,' 'funeral,' 'accident.' The remaining twelve are either doubtful or merely verbal;—'life' four times, 'fear' four times, 'safety,' 'birth,' 'man,' and 'death.' In short, the probability of a definite and vivid response to the words 'danger' and 'death' is four times as great for the unaggressive man as for the aggressive man.

The responses to 'company' show exactly twice as many military, sexual, and commercial associations for the aggressive as for the unaggressive subjects. 'Army' and 'battery' in the aggressive list are to be compared with 'army' once in the lower list; 'girl' occurs twice in the upper list to once in the lower list; and 'business' and 'insurance' in the upper list are to be compared with 'Ford' in the lower list. The evidence, which is slight, points to the conclusion that aggressiveness doubles the probability of a definite and energetic response to the word 'company.'

The responses to the word 'opponent' are extremely difficult to interpret, and seem to show such an influence of the language habit that the word is probably not a suitable one for giving scorable results. The aggressive responses;—'box,' 'politics,' 'hatred,' and possibly 'war' are more pointed expressions of personal antagonism than any of the words in the unaggressive list except 'fight;' but 'football' and 'hardware' leave considerable doubt, and both lists contain a high per cent of merely verbal associations.

Confining our statement of the results to the five words which afforded the most definite responses, we may say that the very aggressive man is four times as likely to be positive

and definite in his responses to 'enterprise' and 'success,' twice as likely to give an energetic type of response to 'company;' and only one-fourth as likely to respond definitely and vividly to 'danger' and 'death' as the very unaggressive man. These differences are large enough to warrant the use of the word responses as one of the minor scoring elements in a measurement of aggressiveness.

The time records for the responses show a marked difference for the stimulus words 'danger' and 'enterprise.' Otherwise the average differences for the aggressive and the unaggressive groups are less than half a second. For 'danger' the unaggressive subjects take an average time of 2.31 seconds as compared with an average time of 1.26 seconds for the aggressive subjects. For 'enterprise' the unaggressive subjects average 2.55 seconds and the aggressive subjects 1.54 seconds. Failures to respond are not here reckoned in averaging the time, for the reason that such failures were due to imperfect exposure of a few words in the early part of the experiment.

Seven of the unaggressive responses to 'enterprise' required two seconds or more, as compared with one such case among the aggressive subjects. Likewise six of the unaggressive subjects required two seconds or more to respond to the word 'danger,' as compared with one such case among the aggressive subjects. This difference is not due to the greater average quickness of response of the aggressive subjects, as their averages for the remaining four words are actually about a fifth of a second slower than the corresponding average for the unaggressive subjects. Apparently it is due to some peculiar relation of the two words to the two classes of subjects. The obvious assumption in regard to 'danger' is that it comes near to awakening true emotional disturbances, much more nearly so in the unaggressive subjects. Their slowness in responding to 'enterprise' might be due either to emotional inhibition or to paucity of ideational material, either a matter of self reproach or of an unfamiliar concept. Whatever the theoretical explanation, the time record of the two groups of subjects is large enough and constant enough to justify its use in differentiating the two types of individuals.

#### CONCLUSION

We are now ready to propose a method of scoring aggressiveness on the basis of our tests. In order to have a perfect record on the trait, a man should be able to maintain perfect control of his eyes in the interview test; he should withstand

with complete success all the three types of distraction; and in the association tests he should respond definitely and positively to 'enterprise,' 'success,' and 'company,' and indefinitely to 'danger,' and 'death,' moreover, his reaction time to 'enterprise' and 'danger' should not be noticeably longer than his normal word reaction time. The scoring method proposed makes deductions from 100 points for each failure of a subject to meet satisfactorily the four types of requirement just mentioned. Corresponding to the relative importance of the different tests for this purpose a maximum possible deduction of 50 points is allowed for eye movements in test I, a maximum of 25 points each for the distraction and association tests. Stated more in detail, the scheme of deductions for each type of failure is as follows: In the interview test 5 points are deducted for every movement up to ten movements. The maximum deduction is therefore 50 points. For the staring distraction record two points are deducted for each second of time increase in excess of three seconds above his normal adding time. The maximum deduction allowed is 10 points. For the shock distraction 2 points are deducted for every second of time increase in excess of five seconds. The maximum deduction allowed is 10 points. For the snake distraction test 1 point is deducted for each second of time increase in excess of seven seconds. The maximum deduction allowed is 5 points. In the word association test 2 points are deducted for each negative response to 'enterprise,' 'success,' or 'company' and for each vivid, personal type of response to 'death' or 'danger.' One point is deducted for each colorless or doubtful response to 'enterprise,' 'success' or 'company.' The maximum deduction on the basis of the word content of responses is thus 10 points. For the time of response to 'enterprise' and 'danger' 1 point is deducted for every fifth of a second in excess of two seconds. The maximum deduction allowed on this account is 15 points.

The score of any individual subject in aggressiveness is to be obtained by totaling his deductions and subtracting the amount from 100 as shown in table VI. On this basis the scores of our thirteen most aggressive subjects are as follows: C. N. 97, Z. J. 100, A. C. 79, R. M. 94, N. A. 98, J. G. 86, E. B. 83, B. W. 100 (lacking word test), R. W. 93, H. C. 98, A. J. 97, E. L. 84, D. R. 100 (lacking the word test). The scores for the thirteen least aggressive subjects are as follows: H. M. 35, J. J. 79, E. R. 55, W. P. 60, N. F. 59, P. G. 72 (lacking word test), F. B. 36, J. M. 81, G. D. 63, R. B. 37, S. H. 88, R. T. 61, B. R. 38 (lacking word test).

TABLE VI  
FINAL SCORES OF 26 SUBJECTS  
Most Aggressive

	Eye Movement	Staring	Shock	Snake	Words	Time	Score
C.N.				2	1		97
Z.J.							100
A.C.	10		10		1		79
R.M.	5				1		94
N.A.		2					98
J.G.	5		2	4	3		86
E.B.		6		1	4	6	83
B.W.					x	x	100
R.W.	5				2		93
H.C.					2		98
A.J.					3		97
E.L.	5	2	6		3		84
D.R.					x	x	100
			Least	Aggressive			
H.M.	35	10	10	3	6	1	35
J.J.	5		10	4	2		79
E.R.	20	4	2	5	4	10	55
W.P.	20		10		6	4	60
N.F.	20				6	15	59
P.G.	25			3	x	x	72
F.B.	35	4		5	5	15	36
J.N.					4	15	81
G.D.	25			2	5	5	63
R.B.	50		2	5	4	2	37
S.H.		4			5	3	88
R.T.	25	4			3	7	61
B.R.	50	10		2	x	x	38

The average score of the aggressive group is 93 and that of the unaggressive, is 58.8. None of the aggressive subjects score less than 79, whereas nine of the least aggressive make less than 64, and one of the others is incomplete. Three of the twenty-six subjects, J. N., S. H., and J. J. appear as noticeable exceptions. It is the opinion of the writers, based on considerable acquaintance with the subjects, that the error in regard to at least two of them lies in original personal ratings rather than in the finding of the test. In any event we seem to be justified in stating that there is hardly one chance in twenty-five that a man weak in aggressiveness would score as high as 85; and there is almost no chance that a very aggressive person will score lower than 70. The writers believe that this test approximates a true measurement of aggressiveness more nearly than does the Army Alpha examination approximate the measurement of intelligence.

Moreover, the test can be given in modified and abbreviated form with no further equipment than a stop watch and a set of addition tables, with the additions all made according to the specifications in test II. In this case it would be necessary to omit the shock and snake distraction tests; also to give the words for the association test orally, and to time the responses with a stop watch. The loss of two of the 10 point tests can be compensated for in the scoring by adding 25% to the total of the deductions made on the basis of the remaining tests.

Aside from the time required of each individual subject for practicing his 50 additions with the tables, the actual time of administering the abbreviated form if the test should not be more than three minute. The longer form with apparatus requires about seven minutes per subject.