THE PERFORMANCE OF OVERACHIEVING MALES ON CERTAIN MEASURES OF EFFICIENCY AND DIVERGENCE: A STUDY IN PERSONALITY INTEGRATION

by

Logan Wright

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Approved:

Major Professor: Julius Seeman

Minor Professor: [signature]

Dean of the Graduate School: Raymond C. Norris

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to

Pat

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Introduction

During the last 10 years a new emphasis has begun to emerge in clinical psychology. Some workers are departing from the traditional line of investigating disturbance and aberration, and are becoming interested in studying Ss who are conspicious in their positive characteristics and integration. The heaviest concentration of this work has been centered in the area of giftedness and creativity. Although it is still rather sparse, one can also find works concerned with such topics as positive mental health (Barron, 1954; Jahoda, 1958; Smith, 1959) self-actualization (Maslow, 1954, 1956a, 1956b, 1959) psychological well-being (McQuitty, 1954) psychological health (Mehlman & Kaplan, 1958; Thorne, 1958) normal personality (Shoben, 1957; Bonney, 1962) efficiency (Wishnor, 1953, 1955, 1961, 1962a, 1962b) personal soundness (Barron, 1955) and personality integration (Seeman, 1959, 1963).

Research in this area is relatively new, and there is not yet any very elaborate theory of positive behavior or integration. This study sought to add an increment of knowledge which will eventually aid in the construction of a more comprehensive and testable theory.

The index of integration employed in this study was academic efficiency as indicated by the extent to which grade point average exceeded measured aptitude. This selection was made in an attempt to utilize a criterion based on the appropriateness or adequacy of objectively measurable behavior. At least two studies (Stringer, 1959; Jackson & Getzels, 1959) have suggested school achievement to be an appropriate index of mental health. Only aptitude measures (Scholastic Aptitude Test scores) were used as criterion predictors, since other variables, such as high school rank, would lower the score of overachievers because of previous achievement.

The purpose of this study was to conduct an inductive search for measures on which the performance of over-achieving Ss was significantly different from that of average achievers. Measures of efficiency and divergence were employed.

Research by Malmo, Shagass, Belanger and Smith (1951), Duffy (1930) and Arnold (1942) suggests that muscle action potentials recorded in a part of the body not involved in performing a task might serve as an index of inefficiency. In this study, measures were acquired pneumatically in a manner described by Luria (1932). Assessing efficiency through the use of various other physiological measures is suggested by such researchers as Freeman (1948), McGurdy (1950), Thetford (1952), Malmo and Davis (1956), Davis (1957), Stennett (1957), Lacy (1959), Rosenstein (1960), Haywood (1961, 1962, 1963), Murray (1963) and Seeman (1963). Measures of palmar sweating, skin resistance and heart rate were employed as physiological indices. Estimates of basal level, increase due to induced arousal, decrease due to adaptation to induced arousal, and decrease due to recovery following termination of induced arousal, were obtained on these three variables. Since Haywood (1963) has found that delayed auditory feedback produces an extremely significant increase in palmar sweating, arousal was induced by this method.

Utilizing flicker fusion responses as a measure of perceptual efficiency is suggested by the work of Saucer and Deabler (1956), Saucer (1958), Dillon (1959), Dillon (1961), and Seeman (1962). Both average threshold estimate and the variance of these estimates were estimated for responses acquired under eight different stimulus conditions.

The possibility that integration, as measured by overachievement, is related to various types of divergence is suggested by Stagner (1933), Berg and Collier (1953), Berg (1955, 1957), Berg and Bass (1959), Crutchfield (1955), Guilford (1957), Nakamura (1958), Bialer (1960), Duff and Siegel (1960), Pepinsky (1960), Erb (1961) and Miller (1963b). The _A-S Reaction Study_ (Allport & Allport, 1939) was employed as a measure of divergence, or non-conformity, in interpersonal situations; and the _Perceptual Reaction Time_ (Berg, 1949) was used to detect divergence in response sets. The _Circles Test_, described by Torrance (1962), served as a measure of cognitive divergence or creativity. The *Modified Locus of Control Scale* described by Bialer (1960) and the *Children's Locus of Evaluation Control Scales* (Miller, 1963a) were used to measure divergence (internal control as opposed to reliance on external norms) in these areas. Finally, responses were obtained on a 15-item MMPI sub-scale and on a 26-item MMPI sub-scale which had previously been correlated with overachievement by Altus (1948) and Hackett (1955, 1960).

Method

Subjects

Ss were drawn from a group of 541 male undergraduates enrolled in psychology 26 at the University of North Carolina. The overachieving group was composed of 20 *Ss* whose obtained GPA ranged from 1.06 to 2.56 standard deviations above its predicted value, with the mean being 1.57 standard deviations above predicted grade point average. The control group consisted of 20 *Ss* who had an obtained GPA ranging from -.37 to +.30 standard deviations from the predicted value, with the mean being -.03 standard deviations from GPA. The standard deviation of GPA was .767. The multiple correlation of predictors with GPA was .456, with the standard error of estimate being .68 of a point on a 4.00 grading scale. All *Ss* were 19-year-old, unmarried, white sophomores. There were no significant differences between the overachieving and normal groups on GPA and number of college hours completed.

Apparatus

Heart rate, GSR and muscle activity were recorded on an Offner type R dynograph. Skin resistance was measured with a Fels dermometer, model number 22A-205. Heart rate measurements were based on the R-R interval in units of .01 seconds. Muscle activity was measured pneumatically and transduced by Stratham Hg. strain gauges. Palmar sweat measures were obtained and quantified with the use of the following equipment manufactured by Lab-Line Instrument Co.: PSI automatic finger printer No. 6000, PSI densitometer No. 6010, PSI film punch No. 6020, ferric chloride ampules No. 6005, film treated with tannic acid No. 6007.

Flicker fusion data were acquired through the use of a specially constructed flicker apparatus. The stimulus consisted of a round green dot, 3/8 in. in diameter, and located in the center of a circular field which was 2 in. in diameter. The field and stimulus appeared at the end of a circular tube 2 in. in diameter and 6 in. long through which Ss looked. The stimulus was provided by passing the light from one Sylvania W-1493 bulb through one Leechtenstein filter No. S74-10-B40. Either white or black field was provided by the presence or absence of lighting from another Sylvania W-1493 bulb. White noise was provided by one Grayson-Stadler Noise Generator. A Viking of Minneapolis, model 85-RP62 Recorder in connection with a Bogen 30-watt

Amplifier was used to produce Delayed Auditory Feedback.

Procedure

Upon reporting to the laboratory, Ss were instructed that all instructions would be good to them.(?) The Delayed Auditory Feedback earphones, GSR and HR electrodes were attached, and a microphone held by a portable floor stand was adjusted directly in front of S's mouth at a distance of 4 in. Volume switches on the recorder and amplifier were turned to maximum volume position, providing a loud but not noxious volume. The delay interval was set at .2 sec. Ss were then given a 7-min. adaptation period at the end of which physiological basal measures were taken. E then provided the following instructions:

> Read into the microphone and listen to yourself read as best you can. It is important that you read as well as you can and as fast as you can, and do not stop until I tell you to do so.

Ss read for 3 min. while experiencing DAF. At the end of this time, they were allowed to relax for 1 min. 30 sec. During this 4-min. 30-sec. period, GSR and HR were recorded continuously with PSI measures obtained every minute.

Next, Ss were asked to hold a pneumatic bulb in each hand. E then gave the following instructions:

> I am going to read some words. When I say a word, you make an association and say it back to me squeezing the bulb in your right hand. For instance, if I said black you might say white (E closes his right hand in view of S). All right,

let's try one for practice - day.

Ss were allowed to practice until they understood. E then read words one through twenty-five of the Whately-Smith word list (Smith & Brown, 1922, p. 76) allowing Ss time to verbalize each association. Ss were then presented with six alternating ascending and descending trials with the stimulus appearing on the white field. The ascending trials began at 45 cycles per sec. The frequency was increased manually at the rate of 1 cycle per sec. to the threshold level, where it was immediately increased to 95 cycles per sec. The descending trial was then presented with the frequency decreased at the rate of 1 cycle per sec. Next, Ss were given six identical trials under black field condition. Twelve trials identical to the 12 mentioned above, were then presented under conditions of white noise at a volume of 0 as indicated by the volume unit meter. Finally, Ss were allowed to work for 10 min. on the Circles Test, and then instructed to complete the A-S Reaction Study, Modified L-C Scale, Perceptual Reaction Test, Cloe-C Scales, Hackett Scale, and Altus Scale in that order.

Results

The initial analysis sought to determine the effect of DAF as an arousal producing stimulus. It sought also to determine whether Ss adapted to and recovered following exposure to such stimulation. To test the initial effect of DAF, difference between basal arousal (as measured by PSI, GSR and HR) and level of arousal immediately following the onset of DAF was estimated by the use of matched-pairs *t* tests. To determine if adaptation took place, matched-pairs *t* tests were run between level of arousal immediately following the onset of DAF, and arousal level after 3 min. of DAF. To assess the occurrence of recovery, matched pairs *t* tests were run between level of arousal after 3 min. of DAF and the level at 1 min. 30 sec. following the cessation of DAF. The results of these tests are shown in Tables 1, 2, and 3.

Table 1

Results of Matched Pairs *t* Tests Showing the Effect of Induced Arousal on PSI, GSR, and HR Variables

Variable	Mean basal level	Mean following onset of DAF	*t*
HR (in beats per min.)	76.23	101.32	74.96*
GSR (in ohms of resistance)	93212.36	36,578.86	254.13*
PSI (in micro amps)	7.95	17.53	46.48*

*probability .0005.

Estimations of *t* tests were performed in order to determine which of the variables measured in this study were effective in differentiating between the overachieving and

Table 2

Results of Matched-Pairs *t* Tests Showing the Effect
of Adaptation to Induced Arousal on
PSI, GSR, and HR Variables

Variable	Mean following onset of DAF	Mean following 3-min. exposure to DAF	*t*
HR (in beats per min.)	101.32	90.50	41.27[a]
GSR (in ohms of resistance)	36,576.86	42,926.36	3.49[b]
PSI (in micro amps)	17.53	23.03	24.51[c]

a. probability .0005.
b. probability .005.
c. probability .0005, but not in the direction of adaptation.

Table 3

Results of Matched-Pairs *t* Tests Showing the Effect
of Recovery from Induced Arousal on
PSI, GSR, and HR Variables

Variable	Mean following onset of DAF	Mean following 3-min. exposure to DAF	*t*
HR (in beats per min.)	90.50	82.27	55.14*
GSR (in ohms of resistance)	42,926.36	47,944.36	4.63*
PSI (in micro amps)	23.03	17.11	27.02*

*probability .0005.

average achieving groups. Results of these tests are shown in Table 4.

Table 4

Means and Significance of Difference Between Means for Overachieving and Average Achieving Groups on 73 Study Variables

Variable	Mean for average achievers	Mean for over-achievers	t
HR basal measure 1 (average rate as obtained from a 15 sec. measure taken at the end of adaptation period).	79.45	75.02	1.25
HR basal measure 2 (variability in rate during a 15 sec. measure taken at the end of adaptation period).	30.53	23.01	.95
HR induced measure 1 (increase in rate of measure taken during the first 15 sec. of delayed auditory feedback over rate of basal measure 1).	22.12	28.06	1.42
HR induced measure 2 (increase in variability of measure taken during the first 15 sec. of DAF over variability in basal measure 2).	-.26	5.73	.53
HR induced measure 3 (average rate increase of three 15 sec. measures taken: (1) during the first 15 sec. of DAF; (2) after 1 min of DAF; (3) after 2 min. of DAF, over rate of basal measure 1).	16.13	21.76	1.56

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	t
HR induced measure 4 (increase in rate of the highest induced measure over the rate of basal measure 1).	24.36	28.33	.97
HR adaptation quotient (decrease in rate of 15 sec. measure taken during the first 15 sec. of DAF over 15 sec. measure taken after 2 min. of DAF).	9.82	11.83	.60
HR recovery quotient 1 (increase of 15 sec. measure taken 1 min. 15 sec. after the cessation of DAF over 15 sec. measure taken after 2 min. of DAF).	5.58	10.88	1.84
HR recovery quotient 2 (decrease of lowest 15 sec. post DAF measure over 15 sec. measure taken after 2 min. of DAF).	8.00	11.63	1.28
HR recovery quotient 3 (amount of time elapsing between cessation of DAF and mid point of lowest 15 sec. post DAF measure).	76.38	80.30	1.56
GSR basal measure (resistance level taken at the end of the adaptation period).	94,489.71	91,935.00	.14
GSR induced measure 1 (decrease in resistance of measure taken at the beginning of DAF over basal resistance level).	55,645.00	57,625.00	.16

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	t
GSR induced measure 2 (decrease in resistance of the average of three measures taken): (1) at the beginning of DAF; (2) after 1 min. 15 sec. of DAF; (3) after 2 min. 15 sec. of DAF, over basal resistance level.	56,618.35	50,161.80	.61
GSR induced measure 3 (decrease in resistance of the minimum of the 3 induced measures over the basal resistance level).	61,825.00	61,900.00	.01
GSR adaptation quotient (increase in resistance of measure taken after 2 min. 15 sec. of DAF over resistance level at the beginning of DAF).	7,205.00	5,490.00	.46
GSR recovery quotient 1 (increase in resistance of measure taken 1 min. 30 sec. after the cessation of DAF over resistance level after 2 min. 15 sec. of DAF).	1,695.00	8,340.00	1.57
GSR recovery quotient 2 (increase in resistance of highest post DAF measure over resistance level after 2 min. 15 sec. of DAF).	3,970.00	8,865.00	1.35

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	*t*
GSR recovery quotient 3 (amount of time in sec. elapsing between cessation of DAR and the highest post DAF measure).	72.45	70.95	.24
PSI basal measure (30 sec. measure taken at the end of adaptation period).	9.05	6.85	.87
PSI induced measure 1 (increase in sweating of measure taken after 30 sec. of DAF over basal measure).	7.60	11.55	1.54
PSI induced measure 2 (increase in sweating of the average of three 30 sec. measures taken: (1) after 30 sec. of DAF; (2) after 1 min. 30 sec. of DAF and (3) after 2 min. 30 sec.of DAF over basal measure).	10.77	23.03	1.27
PSI induced measure 3 (increase in sweating of the maximum of three induced measures over the basal measure).	16.25	18.40	.72
PSI adaptation quotient (increase in sweating of measure taken after 2 min. 30 sec. of DAF over measure taken after 30 sec. of DAF).	-6.35	-3.75	1.00
PSI recovery quotient (increase in sweating of 30 sec. measure taken 1 min. after the cessation of DAF over 30 sec. measure taken after 2 min. 30 sec. of DAF).	5.75	6.10	.12

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	*t*
Pneumatic task (total magniture in cm. of responses on relevant bulb).	360.42	364.42	.14
Pneumatic task (total duration in mm. of responses on relevant bulb).	45.70	54.97	1.31
Pneumatic task (total time in sec. required to complete task).	81.60	83.85	.34
Pneumatic task (longest duration in mm. between any two responses on the relevant bulb).	46.64	48.88	1.19
Pneumatic task (number of responses on irrelevant bulb).	7.60	11.15	1.32
Pneumatic task (total magnitude in mm. of responses on irrelevant bulb).	28.05	72.90	1.31
Pneumatic task (percentile rank based on rater judgments of total activity on irrelevant bulb).	50.37	49.63	.27
Flicker fusion (average of all thresholds).	56.73	56.08	.40
Flicker fusion (average of all ascending thresholds).	60.45	59.97	.29
Flicker fusion (average of all descending thresholds).	52.99	52.06	.62

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	*t*
Flicker fusion (average of all thresholds obtained under noise conditions).	57.48	56.48	.57
Flicker fusion (average of all thresholds obtained under no noise conditions).	56.64	56.07	.35
Flicker fusion (average of all thresholds with flicker stimulus presented on a black field).	56.80	56.44	.21
Flicker fusion (average of all thresholds with flicker stimuli presented on a white field).	56.63	55.72	.58
Flicker fusion (average threshold for all no noise, white field, ascending thresholds).	60.37	60.40	.02
Flicker fusion (average threshold for all no noise, white field, descending thresholds).	52.91	51.59	.86
Flicker fusion (average threshold for all no noise, black field, ascending thresholds).	58.05	57.97	.05
Flicker fusion (average threshold for all no noise, black field, descending thresholds).	53.00	52.28	.49
Flicker fusion (average threshold for all noise, white field, asecnding thresholds).	61.40	57.53	1.06

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	t
Flicker fusion (average threshold for all noise, white field, descending thresholds).	52.54	49.51	.94
Flicker fusion (average threshold for all noise, black field, ascending thresholds).	62.03	58.12	1.24
Flicker fusion (average threshold for all noise, black field, descending thresholds).	53.56	49.54	1.53
Flicker fusion (variance of all measures).	24.21	29.69	1.03
Flicker fusion (variance of all ascending measures).	21.83	15.24	1.21
Flicker fusion (variance of all descending measures).	4.56	7.65	1.07
Flicker fusion (variance of all measures obtained under noise condition).	28.94	30.26	.18
Flicker fusion (variance of all measures obtained under no noise condition).	26.25	32.06	.88
Flicker fusion (variance of all measures obtained under black field condition).	27.23	32.62	.81
Flicker fusion (variance of all measures obtained under white field condition).	29.72	27.11	.38

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	*t*
Flicker fusion (variance of all measures obtained under conditions of no noise, white field, ascending frequency).	13.19	7.76	.95
Flicker fusion (variance of all measures obtained under conditions of no noise, white field, descending frequency).	1.34	2.95	1.10
Flicker fusion (variance of all measures obtained under conditions of no noise, black field, ascending frequency).	39.24	25.63	.93
Flicker fusion (variance of all measures obtained under conditions of no noise, black field, descending frequency).	3.44	7.11	1.06
Flicker fusion (variance of all measures obtained under conditions of noise, white field, ascending frequency).	8.10	16.50	.81
Flicker fusion (variance of all measures obtained under conditions of noise, white field, descending frequency).	1.36	4.06	.86
Flicker fusion (variance of all measures obtained under conditions of noise, black field, ascending frequency).	6.69	5.73	.25
Flicker fusion (variance of all measures obtained under conditions of noise, black field, descending frequency).	6.86	6.19	1.16

Table 4 (continued)

Variable	Mean for average achievers	Mean for over-achievers	t
A-S Reaction Study	1.95	-3.10	.80
Modified L-C Scale	17.60	17.35	.43
Cloe Evaluation Scale	18.30	18.20	.10
Cloe Control Scale	22.85	21.65	2.20*
Circles Test (productivity)	21.70	17.20	1.66
Circles Test (elaboration)	1.17	1.31	1.71
Circles Test (originality)	4.05	3.15	.77
Circles Test (total score)	62.92	59.85	.47
Perceptual Reaction Test (No. of extreme responses)	16.80	18.55	.56
Perceptual Reaction Test (No. of negative responses)	20.40	28.85	.71
Hackett Scale	8.70	7.95	1.03
Altus Scale	12.00	11.80	.18

*probability .05.

Since Hoyt and Norman (1954) and Alpert and Haber (1960) have concluded that maladjustment produces both under and overachievement, a Moses test of extreme reaction (Siegel, 1956, p. 145) was computed on the 73 study variables to determine if the overachieving group might be distributed bimodally on some variables. Only three tests showed a significant extreme reaction on the part of the overachieving group. These were: number of responses to irrelevant pneumatic bulb (significant at .05); heart rate basal level 1 (significant at .05); and heart rate recovery quotient 1 (significant at .01).

Because of the low (.456) multiple correlation between predictors and GPA, it was felt that there was a significant amount of error in assigning Ss to groups. Since this would reduce differences between the two groups and thus decrease the probability of obtaining significant *t* tests, an attempt was made to show consistent directional differences by estimating sign tests (Siegel, 1956, p. 68) between the overachieving and average achieving groups using all tests in the various classes of variables as N. Tests were run on the following classes of variables: measures of divergence, measures of physiological activation while task involved; measures of physiological activation while nontask involved, measures of perceptual efficiency during flicker task. These results are shown in Table 5.

Results of three of the classes of variables shown in Table 5 were further broken down, and sign tests run between the overachieving and average achieving groups using all tests of the following subclasses as N: reaction to DAF, adaptation to DAF, responses to pneumatic task; mean of

Table 5

Results of Sign Tests between Overachieving and Average Achieving Groups on Four Classes of Study Variables

Measure	No. of meas. ures where overachievers average achievers	No. of meas. ures where overachievers average achievers	Probability (for two-tailed test)
Physiological activation while task involved	15	4	.020
Perceptual efficiency during flicker task	6	24	.003
Physiological activation while nontask involved	1	10	.012
Measures of divergence	2	8	.110

flicker thresholds, variance of flicker thresholds, basal levels and recovery from DAF.

A rotated principal factor solution (Harmon, 1960, p. 179) was performed on the following 24 previously determined study variables: overachievement - average achievement, grade point average minus predicted grade point average, HR-basal measure 1, HR-induced measure 1, HR-recovery quotient 1, GSR-basal measure, GSR-induced measure 1, GSR-recovery quotient 1, PSI-basal measure, PSI-induced measure 1,

Table 6

Results of Sign Tests between Overachieving and Average Achieving

Groups on Seven Subclasses of Study Variables

Class of variables	Subclass of variables	No. of measures where over-achievers average achievers	No. of measures where over-achievers average achievers	Probability tailed te
Physiological activation while task involved	Reaction to DAF	9	1	.022
	Adaptation to DAF	1	2	.750
	Responses to pneumatic task	5	1	.218
Perceptual efficiency while task involved	Flicker thresholds	1	14	.002
	Flicker variance	5	10	.302
Physiological activation while nontask involved	Basal levels	0	4	.125
	Recovery from DAF	1	6	.124

PSI-recovery quotient, no. of responses on irrelevant bulb, flicker fusion-mean of all thresholds, flicker fusion-variance of all thresholds, A-S Reaction Study, Modified L-C Scale, Cloe Evaluation Scale, Circles Test - productivity, Circles Test - elaboration, Circles Test - originality, Perceptual Reaction Test - no. of committed responses, Perceptual Reaction Test - no. of negative responses, Hackett Scale, and Altus Scale. This analysis was for a twofold purpose. The first was to check empirically whether there was any relationship between the variables included in this study. The second was to assess the relationship between the behavioral systems suggested by Seeman (1963). Five factors were derived. The significant loadings of these factors with their accompanying eigenvalues are shown in Tables 7, 8, 9, 10, and 11.

Though only modest correlations were obtained between study variables and the criterion, it was felt that a multiple correlation might produce a more significant relationship. Thus, a Wherry-Doolittle multiple correlation technique (Wherry 1938, 1941) was employed utilizing the 22 previously determined dependent variables as predictors of the over-achievement-average achievement criterion variable. This method is a modification of the longer Doolittle method, which considers the chance error attendant upon the addition of each test into the predictor battery. The method can be

Table 7

Factor Loadings for the First Factor Derived in the Rotated Principal Factor Solution

Factor title and eigenvalue	Variable	Correlation with factor
Creativity 2.47	Circles test - productivity	.930
	Circles test - originality	.832
	Circles test - elaboration	-.239
	Altus Scale	.603
	A-S Reaction Scale	.500

Table 8

Factor Loadings for the Second Factor Derived in the Rotated Principal Factor Solution

Factor title and eigenvalue	Variables	Correlation with factor
Overachievement 2.42	Overachievement-Normality	.837
	GPA minus PGA	.902
	Hackett Scale	-.524
	PSI induced measure 1	.392

Table 9

Factor Loadings for the Third Factor Derived in the Rotated Principal Factor Solution

Factor title and eigenvalue	Variable	Correlation with factor
Skin resistance 2.37	GSR-basal measure	.779
	GSR-induced measure 1	.832
	GSR-recovery quotient 1	.602
	Modified L-C Scale	.397
	Perceptual Reaction Test-No. of negative responses	-.393

Table 10

Factor Loadings for the Fourth Factor Derived in the Rotated Principal Factor Solution

Factor title and eigenvalue	Variable	Correlation with factor
Heart rate 2.31	Heart rate-basal 1	-.304
	Heart rate-induced 1	.904
	Heart rate-recovery quotient 1	.810
	A-S Reaction Scale	-.614

Table 11

Factor Loadings for the Fifth Factor Derived in the Rotated Principal Factor Solution

Factor title and eigenvalue	Variable	Correlation with factor
Palmar sweating 2.23	PSI-basal	-.312
	PSI-induced measure 1	.538
	PSI-recovery quotient	.744
	CLOE-evaluation scale	.676

applied to a large number of potential predictors, excluding several of them and assigning optimum weights to the selected variables. A battery consisting of seven predictors was selected by this method. The multiple correlation of this battery with overachievement was .58, explaining 34 per cent of the variance in this criterion. The seven predictors and their accompanying beta weights (B) are shown in Table 12.

The multiple correlation between GPA and its predictors (scholastic aptitude, verbal and math scores) is .456, with the standard error of estimate being .68 for a four point grading scale. By combining these two predictors with the seven predictors selected by the Wherry-Doolittle technique a multiple correlation of .70 between these nine predictors

Table 12

Beta Weights of the Seven Predictors Selected by the Wherry-Doolittle Technique

Variable	Beta
Cloe-evaluation scale	-.162
Circles test-productivity	-.268
Heart rate-recovery quotient 1	.201
GSR-recovery quotient 1	.227
No. of responses to irrelevant bulb	.223
PSI-induced measure 1	.241
PSI-recovery quotient	.152

selected by the Wherry-Doolittle technique a multiple correlation of .70 between these nine predictors GPA can be obtained. Thus, 49 per cent of the variance in GPA can be explained by this technique. A formula for predicting GPA is shown in Table 13.

Discussion

The Moses tests of extreme reaction produced only three tests which were significant at the .05 level in the direction of an extreme reaction on the part of the overachieving group. This number is no greater than what would be expected by chance alone. Therefore, the notion suggested by

Table 13

Formula for Predicting Grade Point Average

Variable	Times	Multiplicand
Cloe-evaluation scale	x	-.0368
Circles test-productivity	x	-.0197
Heart rate-recovery quotient 1	x	.0151
GSR-recovery quotient 1	x	.000027
No. of responses to irrelevant bulb	x	.0178
PSI-induced measure 1	x	.0198
PSI-recovery quotient	x	.0107
SAT-verbal	x	.0019
SAT-math	x	.0026
Sum of above products minus .1545 = optimal predicted grade average		

Hoyt and Norman (1954) and Alport and Haber (1960) that the overachievers in this study might be comprised of Ss whose adjustment represents both extremes of an adjustment continuum is not supported. The *t* tests between overachieving and normal groups on the measures of efficiency and divergence produced only one test which was significant at the .05 level. Both the Moses and *t* test data support the findings of Grooms and Endler (1960) which indicated no relationship between anxiety and academic achievement.

The lack of significant results makes it of less consequence that some of the study variables on which t tests were run did not conform closely to the assumptions of homogeniety of variance and normality of distribution. This coupled with the results obtained by Boneau (1960) seems to minimize the problems created by the failure of certain variables to meet these assumptions.

The lack of significance among t tests can be explained to some extent by the low (.456) multiple correlation between predictors and the obtained GPA. This allowed for much error in assigning Ss to the criterion groups, and made differences between these groups extremely subtle. Though statistically significant results could not be obtained because of subtle differences between the two groups on the criterion variable, extremely significant sign test results were then found showing consistent directional differences in the areas of physiological activation while task involved, perceptual efficiency while task involved and physiological activation while nontask involved. These findings suggest very consistent if not significant results.

It is somewhat difficult to attribute a high degree of conclusiveness to results showing consistency in the absence of significance. However, in light of the subtle differences between the two groups, consistent directional differences should be taken more seriously. Also, in line with the purpose of this study, some leads are provided for further research in integration and positive behavior. Research on the hypothesis that overachieving or positively behaving Ss are less activitated while nontask involved, but more activitated when task involved, could be carried out under conditions more deliberately designed to produce significant results. And, as far as theory construction is concerned, this study seems to stress the point that integration should not be regarded solely as efficiency in terms of conserving energy, but also as a type of willingness to expend energy.

Heart rate, GSR and PSI measures all show an extremely significant effect was produced by the arousal producing stimuli. There was also a significant recovery following the cessation of the arousal producing stimuli. These results seem to indicate that the attempt to produce arousal in this study was successful, and that recovery did take place. Heart rate and GSR show a significant effect of adaptation to the arousal producing stimuli. However, PSI indicates significant increase rather than adaptation to arousal. These results raise the question as to what specific difference exists between the human organism's adaptation to arousal as measured by PSI, and adaptation as measured by GSR and HR.

The relationship between the variables employed in the

Wherry-Doolittle multiple correlation and the criterion is much more substantial than any relationship indicated by the *t* tests. In fact, the amount of variance (34 per cent) explained by these seven predictors is slightly more than the average amount explained in 580 studies published between 1948 and 1958 which attempted to predict college performance (Fishman & Pasanella, 1960).

Three of the seven predictors derived for this optimal multiple prediction are physiological recovery quotients, and two others are physiological variables. This suggests a substantial relationship between physiological and academic functioning. The highest beta weight (-.27) was assigned to the productivity measure on the *Circles Test*. There is a negative correlation (-.27) between productivity and elaboration. Elaboration correlates positively (.28) with over-achievement. All this seems to suggest that a tendency toward a qualitative approach (as indicated by the elaboration scale of the Circles Test) is more effective in academic functioning than is a tendency toward a more quantitative approach (as indicated by the productivity scale of the *Circles Test*).

The combination of Wherry-Doolittle predictors with SAT predictors explains 50 per cent of the variance in GPA, and this is considerably more than the amount explained by the average study reviewed by Fishman and Pasanella (1960).

However, the combination of Wherry-Doolittle predictors with the SAT predictors of GPA necessarily represents the applying of study predictors of a dichotomous variable to the prediction of scores for a nondichotomized population. Therefore the multiple correlation of .70 between these combined predictors and GPA is reported for interest's sake, but it must certainly be regarded in light of any discrepancy between the population utilized in this study and the population whose scores are being predicted.

None of the five factors derived in the principal factor solution is a particularly potent one as is indicated by the rather small eigenvalues. Also, there was a general failure of any single variable to load on several factors. This seems to suggest independence rather than a relationship between the variables employed in this study. It is of interest to note there were separate factors for GSR, PSI, and HR (all of which related to overachievement) but no all inclusive physiological factor. This seems to support an assumption that different Ss tend to react to arousal by exhibiting one type of physiological response more than other types.

Some conclusions might be drawn from this data which relate to Seeman's (1963) theory of integration. He refers to integration of the organism and environment in various areas represented by behavioral systems. These systems include the biochemical, physiological perceptual, cognitive developmental, and interpersonal areas. This study was unsuccessful in relating interpersonal behavior, as measured by the A-S Reaction Scale, to integration as defined as overachievement. An attempt to relate this criterion to cognitive behavior, as measured by the Circles Test, was also unsuccessful. However, physiological behavior both in a task involved and nontask involved situation, as well as perceptual behavior in a task involved situation, were related to the criterion.

The question of the relationship between behavioral systems is assessed to some extent by the factor analysis. The fact that three physiological, one creativity and one achievement factor were derived, fails to support any relationship between systems. There did seem to be a relationship between the systems of interpersonal behavior and physiological behavior as is indicated by the strong loading of the A-S Reaction Study on the heart rate factor. However, the failure of any other variables, representing measures of different systems, to load on the five factors fails to support a relationship between systems.

Two previous studies (Baker & Baker, 1956; Bartlett, Ronning & Hurst, 1960) have factor analyzed correlates of academic success. However, neither study included physiological or divergence variables and therefore cannot be properly compared with this study.

Summary

Forty 19-year old, single white males consisting of 20 overachievers and 20 average achievers were administered 73 tests designed to measure efficiency or divergence. Significant differences between the two groups, as measured by *t* tests and the Moses test of extreme reaction, were not more frequent than would be expected by chance. When classes of variables were combined, significantly consistent results, as measured by the sign test, were found indicating overachieving *Ss* to be less aroused when nontask involved, but considerably more activitated when involved in a task. The implications of these results were related to the evolvement of theory and further research in the area of personality integration.

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APPENDIXES

APPENDIX A

BACKGROUND RESEARCH

BACKGROUND RESEARCH

In addition to the studies in positive behavior mentioned in the introduction, there are two additional areas of such research. This includes work in giftedness (Terman, 1925, 1947; Barrett, 1957; Burt, 1958; Gowan, 1958) and creativity (Getzels & Jackson, 1958, 1959, 1960a, 1960b, 1961, 1962; Guilford, 1950, 1956a, 1956b, 1957, 1958, 1959, 1960, 1961; Guilford, Wilson & Christensen, 1952; Torrance, 1959a, 1959b, 1959c, 1959d, 1960a, 1960b, 1960c, 1960d, 1961, 1962).

Recently, Seeman (1963) and his associates have begun the process of evolving a theory of integration. They are seeking to extend beyond the area of creativity where the most work has been done. Currently underway are attempts to develop a personality integration scale, to assess integration through the use of sociometric measures, to relate integration to group behavior and group problem solving tasks and to study integration as it may relate to perception of people. These studies are providing the initial data for a theory of integration by means of construct validation. The present study sought to continue this effort while relying on an objective criterion.

The early use of an objective criterion of integration seemed quite desirable as the interjudge reliability for various assessments of "disintegration" have been disappointingly low (Ash, 1949; Mehlman, 1952; Schmidt & Fonda, 1956). One might expect even greater difficulties in subjectively defining and assessing integration (Hartmann, 1958, p. 80).

At least two studies (Stringer, 1959; Jackson & Getzels, 1959) have suggested academic effectiveness to be an index of mental health. The idea of efficiency as a major variable in such effectiveness is supported by the findings of Jex and Merrill (1958), which indicate that overachievers do not invest greater amounts of time in academic pursuits.

Although efficiency in grade getting is the index of integration used in this study, there is no attempt to so limit the term in searching for instruments which would differentiate the two groups of Ss. Rather, measures were employed which had shown promise in measuring positive behavior as well as the absence of negative characteristics.

Physiological Measures

Dykman, Reese, Galbrecht and Thomasson (1959) appear to be the only previous investigators to associate physiological measures to achievement. Their study was moderately successful in relating skin resistance, heart rate, and respiration to achievement motive. However, the objectives of this study were quite different. Here there was an attempt to relate efficiency in physiological functioning to efficiency in academic performance.

The work of Wishner (1955) suggested the nature of one physiological instrument for use in this study. He has defined psychological health in terms of comparative efficiency in meeting environmental task requirements. Efficiency is said to be a function of focused behavior (F), diffuse behavior (D), and productivity (P). Thus $E = f\ (F/D, P)$. One of the methods for measuring these constructs consists in recording simultaneous indices of tension, such as muscle action potentials, from a part of the body immediately involved in the work (F) and a part of the body not thus involved (D). For this purpose, Wishner suggests the use of an apparatus such as originally used by Luria (1932). This apparatus measures pressure exerted upon a pneumatic bulb in the irrelevant hand while activity is being performed with the relevant hand. The activity of the irrelevant hand is considered diffuse and thus suggestive of inefficiency. Telford and Swenson (1942) used Luria's method, and found that activity decreased in the irrelevant hand as performance improved. Malmo, Shagass, Belanger, and Smith (1951) report that motor disorganization, as measured by a similar type Luria technique, differentiates chronic schizophrenics from normals. Duffy (1940) and Arnold (1942) also report motor inefficiency, as measured by Luria's method, to result from both natural and induced conflict. For these reasons, the measurement of performance on a Luria type pneumatic apparatus was employed as part of this study.

Numerous researchers (Mittelman & Wolff, 1939, 1942; Hovland & Riesen, 1940; Wolf & Wolff, 1947; Grace, Wolf & Wolff, 1951; Davis, Buchwald & Frankmann, 1955; Doust & Schneider, 1955a, 1955b) have suggested the use of other physiological measures to assess efficiency. This is provided efficiency is defined as sufficient, but not unnecessary, "arousal," "activation," "energy level," "behavioral intensity," etc. Stennett (1957), as well as several other writers, has stressed degree of deflection in skin resistance resulting from experimentally induced stress as a measure of psychological disturbance. Lacy (1959), on the basis of his own work and that of McGurdy (1950), concluded that "differential magnitude of galvometric deflections to words (Whately-Smith word list, Smith & Brown, 1922, p. 76) is one of the most reliable phenomena in psychology today." Freeman (1948), Thetford (1952) and Seeman (1963) have suggested galvanic skin response recovery quotient (based on the rapidity of return to basal rate following the cessation of experimentally induced conflict) as a measure of integration. In this study it was also felt that an adaptation quotient (based on the decline or increase in conductance during the later exposure to experimentally induced conflict) might relate to integration.

A small adaptation quotient and recovery quotient as well as strong reaction to experimental threat would seem to suggest unnecessary arousal and consequently inefficiency. For this reason, these tendencies were measured. Since Haywood (1963) had found that delayed auditory feedback produces an extremely significant increase in palmar sweating, the deflection was produced by this method.

The third measure, that of heart rate, was suggested by previous research including Thetford (1952), Malmo and Davis (1956), and Murray (1963). Thetford found heart rate measures obtained during experimentally induced frustration differentiated Ss who had received psychotherapy from a control group awaiting therapy. Malmo and Davis found heart rate to be significantly related to arousal resulting from "motivation to accomplish" a mirror drawing task. Murray also found heart rate variation to accompany experimentally induced arousal. These works seemed to provide sufficient justification for including degree of deflection, recovery quotient and adaptation quotient of heart rate as a measure of physiological efficiency in the present study. Delayed auditory feedback was also used as a means of inducing arousal in this case.

Palmar sweat has also been related to several variables that are possibly related to integration. Light (1951) found palmar sweat index varied with psychological tension in therapy, and Beam (1955) found an extremely significant increase in sweating to result from various natural sources of anxiety. Academic examinations were found by Davis (1957) to produce an increase in PSI response. Rosenstein (1960) has reported that PSI increases with experimentally induced "ego threat." Finally, Haywood (1961, 1962, 1963) has found greater sweating as the result of various stimuli which are not easily assimulated. These results seemed to indicate that degree of arousal, recovery quotient and adaptation quotient in palmar sweating might be appropriate measures of efficiency for the present study. Here too, arousal was provided by delayed auditory feedback.

Perceptual Measures

At least one perceptual measure seemed appropriate in the present study. Seeman (1963) has suggested flicker fusion as a measure of ability to tolerate instability. He also suggests ability to tolerate instability to be indicative of greater integration and efficiency. In a previous study, Seeman (1962) found significant differences in flicker fusion responses resulting from experiences in psychotherapy. Dillon (1961) has also found similar differences while utilizing a more severely disturbed population. Working with flicker fusion, Saucer and Deabler (1956), Saucer (1958) as well as Dillon (1959), have obtained results which indicate both threshold, and variance in threshold estimate, differences between normals and psychiatric patients. On the basis of this previous work, both a higher flicker fusion threshold, and a small variance in flicker responses, under varied conditions were considered as measures of perceptual efficiency.

Measures of Divergence

A more molar approach to understanding integration (as measured by overachievement) has been suggested by Pepinsky (1960). She refers to "productive non-conformity." Following this lead, as well as that of Guilford (1957), this study added measures of "divergence" to the above mentioned perceptual and physiological measures.

In addition to Pepinsky, Crutchfield (1955), Nakamura (1958), Duff and Siegel (1960), and Erb (1961) have suggested degree of conformity might be negatively related to the criterion utilized in this study. The A-S Reaction Study, a scale for measuring ascendance-submission in personality, was included, since it appeared to be an objective measure of the type of divergence in interpersonal relationships mentioned by Pepinsky, Crutchfield, etc. Stagner (1933) has found a mild relationship between nonconformity on the A-S Scale and academic success. Snyder (1949) reports A-S Scale reliability coefficients of .85 and .90. He concludes that alhtough this does not appear to be a test of total personality, it is inexcelled as a measure of submissive tendencies.

The <u>Circles Test</u>, described by Torrance (1962), was used as a measure of divergence as described by Guilford (1957). This instrument measures creativity by assessing productivity, originality and elaboration. Collins (1963) reports an inter-rater reliability coefficient of .85 for this scale. Following the lead of McReynolds, Acher and Pietila (1961), productivity and elaboration scores were considered characteristic of motivational variables and greater originality scores characteristic of efficiency variables.

In this study, internal locus of control was considered as a deviation away from group or general norms and thus a type of divergence. Locus of control was measured by the Modified L-C Scale developed by Cromwell and Bialer (Bialer, 1960). It is based in part on previous work by Phares (1955) and James (1957). An investigation by Miller (1960) indicates the split-half reliability of this scale to be high (.94). McConnell (1960) obtained a test - retest reliability coefficient of .90. Various other studies (Pryer, 1959; Butterfield, 1961a, 1961b; Miller, 1961) have demonstrated the relationship between performance on this scale and learning. Also, Cromwell, Rosenthal, Shadow and

This is an error. McConnell used another scale. Test-retest on B-C scale is .74.

Zahn (1961) found schizophrenics were extremely oriented to external locus of control as measured by this scale.

Seeman (1963) has suggested locus of evaluation as a measure of integration. The scale used for this purpose was developed by Miller (1963a). He has demonstrated a significant degree of independence between scores on this scale and locus of control as measured by the Modified L-C Scale. Miller reports reliability coefficients of .80 and up. Also, performance on this scale has been related to academic performance (Miller, 1963b). Internal locus of evaluation was regarded as a type of divergence similar to that indicated by internal locus of control.

Berg (Berg & Collier, 1953; Berg, 1955, 1957; Berg & Bass, 1959) has suggested the deviation hypothesis as a theory of divergence. The specific hypothesis may be formulated as follows: deviant response patterns tend to be general; hence those deviant behavior patterns which are significant for atypicalness and thus regarded as indicators or signs are associated with other deviant response patterns which are in noncritical areas of behavior and which are not regarded as indicators or signs. Similar ideas, as they pertain to response sets, have been advanced by Stagner (1937, p. 117) and Cronbach (1946, 1950). Other researchers (Berg, 1953; Lorge, 1937; Mathews, 1924; Thorndike, 1938; and Voth, 1947) have shown that such response sets are reliable and stable.

Berg feels that deviant Ss will tend to mark the two extreme responses on a four point Likart type scale which can be checked either "like much," "like slightly," "dislike slightly," or "dislike much." He feels this is true irrespective of the content of the test. Rubin-Rabson (1954) and O'Donovan (1961) support Berg and have referred to this tendency in terms of committed and noncommittal responses. To test his hypothesis, Berg (1949) has developed the Perceptual Reaction Test. This measure proved effective in discriminating between schizophrenics and normals (Barns, 1954). Barns also found that schizophrenics gave more positive responses than normals. Such evidence seemed to justify the inclusion of the Perceptual Reaction Test as well as suggest the nature of predictions related to it.

Finally, Altus (1943) has developed a 26-item scale from existing MMPI items which seemed to have potential for discriminating between the two groups in this study. He found the scale would differentiate two groups of college students, one of which was working .5 sigma or more above their tested aptitude and one working at .5 sigma or more below. He also found the scale correlated .40 with honor point ratio. Hackett (1955, 1960) has derived a 72-item scale based on MMPI items. He has obtained a correlation of .72 between this scale and first quarter GPA for 100 freshman male students. However, Seegars (1962) was unable to obtain a significant correlation between this scale and GPA using female, upperclass Ss, and while controlling for intelligence. Only 15 of Hackett's items correlate with overachievement, while the other 57 correlate with under-achievement. Thus, these 15 Hackett items and the 26 Altus items were administered in the present study.

Several studies (McClelland, 1953; Veroff, 1953; Angelini, 1955; Jackson & Getzels, 1959; Erb, 1961; Field, 1961; and Lesser, Krawitz & Packard, 1963) have suggested that both the instruments and the criterion utilized in this study might be affected by the sex of the subjects. In each of the cases, the performance of male Ss was more predictable than that of females. For this reason, only male Ss were utilized in this study.

APPENDIX B

AN ELABORATION ON EQUIPMENT AND PROCEDURE

AN ELABORATION ON EQUIPMENT AND PROCEDURE

Equipment

Heart rate, GSR and pneumatic data were recorded on an Offner type R dynograph. Skin resistance was measured with a Fels dermometer, model number 22A-205. Palm-to-palm recordings will be obtained using zinc electrodes (3.14 sq. cm.) and zinc sulfate-agar electrode paste. Heart rate measurements were based on the R-R interval in units of .01 seconds. Recordings were obtained by strapping 1-1/4 in. by 2 in. steel EKG electrodes coated with Redux electrode paste to the gastrocnemius muscle of S's left leg and the tricep muscle of S's right arm. Motor activity was measured pneumatically and transduced by Stratham Hg. strain gauges. A round bulb 1-1/4 in. in diameter made of 1/16 in. rubber was held in the right (also known as the relevant) hand. It was connected to a 0-to-75 cm. Hg. strain gauge by means of a rubber hose 5/16 in. in diameter constructed of 1/16 in. rubber. An oval shaped bulb 3 in. long and 1-1/2 in. in diameter made of 1/16 in. rubber was held in the left (also known as the irrelevant) hand. It was connected to a 0-to-5 cm. Hg. strain gauge by means of a rubber hose 5/16 in. in diameter constructed of 1/16 in. rubber. In the relevant bulb, pressure changes of 3 cm. registered deflections of 1 mm. on the dynograph. Sensitivity in the irrelevant bulb was 50 times greater so that pressure changes of .06 cm.

will register changes of 1 mm. on the dynograph.

Palmar sweat measures were obtained and quantified with the use of the following equipment manufactured by Lab-Line Instrument Co.: PSI automatic finger printer No. 6000, PSI densitometer No. 6010, PSI film punch No. 6020, ferric chloride ampules No. 6005, film treated with tanic acid No. 6007.

Flicker fusion data were acquired through the use of a specially constructed flicker apparatus. It was housed in a 1 ft. by 1 ft. by 3 ft. wooden box, and mounted on 2 ft. 6 in. portable platform. The stimulus consisted of a round green dot, 3/8 in. in diameter, and located in the center of a circular field 2 in. in diameter. The field and stimulus appeared at the end of a circular tube 2 in. in diameter and 6 in. long, through which S looked. The stimulus was provided by passing the light from one Sylvania W-1493 bulb through one Leechtenstein filter No. S74-10-B40. Either white or black field was provided by either the presence or absence of lighting from another Sylvania W-1493 bulb. The apparatus was capable of providing any flicker frequency between 1 and 100 cycles per second. White noise was provided by one Grayson-Stadler noise generator. A Viking of Minneapolis, model 85-RP62 recorder in connection with a Bogen 30-watt Amplifier was used to produce DAF.

Procedure

Upon reporting to the laboratory, S was instructed to give E all coats, books, etc. Next, he was asked to be seated in a large lounge chair and to make himself comfortable. E then read all further instructions from a typed instruction sheet beginning:

> In order that all subjects receive exactly the same instructions, I'm going to read them to you. Would you please roll up your left pant leg to the knee and your right shirt sleeve to the shoulder?

Next the DAF earphones, GSR and HR electrodes were attached. A microphone held by a portable floor stand was adjusted directly in front of S's mouth at a distance of 4 in. Volume switches on the recorder and amplifier were turned to maximum volume position, providing a loud, but not noxious, volume. The delay interval was set at .2 sec. The tray of a portable hospital table was then placed over S's lap. One volume of Lindzey (1954) open to page 450 rested on the tray adjusted at a 45^{o} angle. The PSI printer rested on the table's flat tray to S's right. Next E read:

> Help me adjust this table so you can read. Later on we're going to be taking some fingerprints. I want to show you how to place your finger in the machine. Place your finger in this hole with the back side of your finger against the outer edge, and the end of your finger should rest on the little ledge at the bottom. Let's try it once.

E then assisted S until his finger was correctly inserted into the printer. Then E read:

> Just sit back and relax. It is important that you do not move your arms or legs.

E then left the room, providing S with a 7 min. adaptation period. At the end of this time, E returned to the room and read:

> I'm going to take a fingerprint now (coating S's right thumb with $FeCl_2$) let it dry for a minute.

After the finger had dried for 15 sec. it was placed in the printer for 30 sec. At the end of this time E read:

> Later I'll be taking your fingerprints while you read. When I say begin, start reading here (pointing to upper left hand corner of page 450) - read into the microphone and listen to yourself read as best you can. It is important that you read as well as you can and as fast as you can, and do not stop until I tell you to do so.

E then turned on the DAF and said:

> Begin.

During DAF, one PSI measure per min. was obtained using the three middle fingers of S's right hand. The index finger was printed first, with the middle and ring fingers printed second and third respectively. After 3 min. E said:

> Stop.

The number of lines S had read was recorded. The DAF was then turned off and S allowed to relax for 1 min. At the end of this time, a 30 sec. PSI measure was taken from the little finger of the right hand.

At this point, the earphones, microphone, table and all electrodes were removed and S was allowed to roll down his shirt sleeves and pant leg. Then, E read:

> Rest your hands on the chair arms with your palms up. I would like for you to hold two bulbs.

E placed the small bulb between the heel of S's right thumb, and his right index and middle fingers saying:

> Hold this bulb like this so you can press it with these two fingers.

Then, E placed the large bulb in the palm of S's left hand saying:

> Hold this bulb, but you won't have to squeeze it.

E then said:

> I am going to read some words. When I say a word, you make an association and say it back to me squeezing the bulb in your right hand. For instance, if I said black you might say (E closed his right hand in view of S) white. All right let's try one for practice - day.

S was allowed to practice until he understood. E then said:

> Are you ready to begin?

Words 1 through 25 of the Whately-Smith word list (Smith & Brown, 1922, p. 76) were then read allowing S time to verbalize each association.

Next, E adjusted the flicker apparatus directly in front of S saying:

> I'd like for you to look into this tube. Each time the light changes from flicker to fusion tell me. When the light quits blinking

> say, fusion. When it begins to blink again say, flicker.

E then presented S with six alternating ascending and descending trials with the stimulus appearing in a white field. The ascending trials began at 45 cycles per sec. The frequency was increased manually at the rate of 1 cycles per sec. As soon as S said, fusion, the frequency was increased to 95 cycles per sec, and the descending trial presented at the rate of 1 cycles per sec. until S said flicker. Next, S was given six identical trials under black field condition. E then read:

> OK, sit back. Put on these earphones. I'll turn on some noise and we'll go through the same process again. Be sure and tell me everytime it changes from flicker to fusion or from fusion to flicker.

White noise was presented at volume of 0 as indicated by the volume unit meter. O represents a loud and somewhat noxious volume. Finally, S performed 12 trials identical to the first 12, except under white noise conditions.

At the completion of the flicker task, the table was returned over S's lap. He was allowed to work for 10 min. on the Circles Test. He was then instructed to complete the A-S Reaction Scale, Modified L-C Scale, Perceptual Reaction Test, Cloe-C Scale, Hackett Scale, and Altus Scale in that order.

APPENDIX C

ADDITIONAL RESULTS AND DISCUSSION

ADDITIONAL RESULTS AND DISCUSSION

Results

In order to check further the relationship between study variables and overachievement, point biserial correlations were estimated between the criterion variable* of overachievement - normality and each of the 73 study variables. The results are shown in Table 14.

Table 14

Point Biserial Correlations between the Criterion Variable of Overachievement-Normality and Study Variables

Variable	Correlation with criterion
HR basal measure 1 (average rate as obtained from a 15 sec. measure taken at the end of adaptation period).	-.20
HR basal measure 2 (variability in rate during a 15 sec. measure taken at the end of adaptation period).	-.15
HR induced measure 1 (increase in rate of measure taken during the first 15 sec. of delayed auditory feedback over rate of basal measure 1).	.23
HR induced measure 2 (increase in variability of measure taken during the first 15 sec. of DAF over variability in basal measure 2).	.09

Table 14 (continued)

Variable	Correlation with criterion
HR induced measure 3 (average rate increase of three 15 sec. measures taken: (1) during the first 15 sec. of DAF; (2) after 1 min. of DAF; (3) after 2 min. of DAF, over rate of basal measure 1).	.25
HR induced measure 4 (increase in rate of the highest induced measure over the rate of basal measure 1).	.16
HR adaptation quotient (decrease in rate of 15 sec. measure taken during the first 15 sec. of DAF over 15 sec. measure taken after 2 min. of DAF).	.10
HR recovery quotient 1 (increase of 15 sec. measure taken 1 min. 15 sec. after the cessation of DAF over 15 sec. measure taken after 2 min. of DAF).	.29
HR recovery quotient 2 (decrease of lowest 15 sec. post DAF measure over 15 sec. measure taken after 2 min. of DAF).	.24
HR recovery quotient 3 (amount of time elapsing between cessation of DAF and mid point of lowest 15 sec. post DAF measure).	.25
GSR basal measure (resistance level taken at the end of the adaptation period).	-.02
GSR induced measure 1 (decrease in resistance of measure taken at the beginning of DAF over basal resistance level).	.03
GSR induced measure 2 (decrease in resistance of the average of three measures taken: (1) at the beginning of DAF; (2) after 1 min. 15 sec. of DAF; (3) after 2 min. 15 sec. of DAF, over basal resistance level).	-.10

Table 14 (continued)

Variable	Correlation with criterion
GSR induced measure 3 (decrease in resistance of the minimum of the 3 induced measures over the basal resistance level).	.01
GSR adaptation quotient (increase in resistance of measure taken after 2 min. 15 sec. of DAF over resistance level at the beginning of DAF).	.07
GSR recovery quotient 1 (increase in resistance of measure taken 1 min. 30 sec. after the cessation of DAF over resistance level after 2 min. 15 sec. of DAF).	.25
GSR recovery quotient 2 (increase in resistance of highest post DAF measure over resistance level after 2 min. 45 sec. of DAF).	.21
GSR recovery quotient 3 (amount of time in sec. elapsing between cessation of DAF and the highest post DAF measure).	-.04
PSI basal measure (30 sec. measure taken at the end of adaptation period).	-.14
PSI induced measure 1 (increase in sweating of measure taken after 30 sec. of DAF over basal measure).	.24
PSI induced measure 2 (increase in sweating of the average of three 30 sec. measures taken: (1) after 30 sec. of DAF; (2) after 1 min. 30 sec. of DAF and (3) after 2 min. 30 sec. of DAF over basal measure).	.20
PSI induced measure 3 (increase in sweating of the maximum of three induced measures over the basal measure).	.12

Table 14 (continued)

Variable	Correlation with criterion
PSI adaptation quotient (increase in sweating of measure taken after 2 min. 30 sec. of DAF over measure taken after 30 sec. of DAF).	.16
PSI recovery quotient (increase in sweating of 30 sec. measure taken 1 min. after the cessation of DAF over 30 sec. measure taken after 2 min. 30 sec. of DAF).	.02
Pneumatic task (total magnitude in cm. of responses on relevant bulb).	.02
Pneumatic task (total duration in mm. of responses on relevant bulb).	.21
Pneumatic task (total time in sec. required to complete task).	.06
Pneumatic task (longest duration in mm. between any two responses on the relevant bulb).	-.19
Pneumatic task (number of responses on irrelevant bulb).	.21
Pneumatic task (total magnitude in mm. of responses on irrelevant bulb).	.20
Pneumatic task (percentile rank based on rater judgments of total activity on irrelevant bulb).	-.04
Flicker fusion (average of all thresholds).	-.07
Flicker fusion (average of all ascending thresholds).	-.04
Flicker fusion (average of all descending thresholds).	-.10
Flicker fusion (average of all thresholds obtained under noise conditions).	-.09

Table 14 (continued)

Variable	Correlation with criterion
PSI adaptation quotient (increase in sweating of measure taken after 2 min. 30 sec. of DAF over measure taken after 30 sec. of DAF).	.16
PSI recovery quotient (increase in sweating of 30 sec. measure taken 1 min. after the cessation of DAF over 30 sec. measure taken after 2 min. 30 sec. of DAF).	.02
Pneumatic task (total magnitude in cm. of responses on relevant bulb).	.02
Pneumatic task (total duration in mm. of responses on relevant bulb).	.21
Pneumatic task (total time in sec. required to complete task).	.06
Pneumatic task (longest duration in mm. between any two responses on the relevant bulb).	-.19
Pneumatic task (number of responses on irrelevant bulb).	.21
Pneumatic task (total magnitude in mm. of responses on irrelevant bulb).	.20
Pneumatic task (percentile rank based on rater judgments of total activity on irrelevant bulb).	-.04
Flicker fusion (average of all thresholds).	-.07
Flicker fusion (average of all ascending thresholds).	-.04
Flicker fusion (average of all descending thresholds).	-.10
Flicker fusion (average of all thresholds obtained under noise conditions).	-.09

Table 14 (continued)

Variable	Correlation with criterion
Flicker fusion (variance of all descending measures).	.17
Flicker fusion (variance of all measures obtained under noise condition).	.14
Flicker fusion (variance of all measures obtained under no noise condition).	.01
Flicker fusion (variance of all measures obtained under black field condition).	.13
Flicker fusion (variance of all measures obtained under white field condition).	-.06
Flicker fusion (variance of all measures obtained under conditions of no noise, white field ascending frequency).	-.15
Flicker fusion (variance of all measures obtained under conditions of no noise, white field, descending frequency).	.17
Flicker fusion (variance of all measures obtained under conditions of no noise, black field, ascending frequency).	-.15
Flicker fusion (variance of all measures obtained under conditions of no noise, black field, descending frequency).	.17
Flicker fusion (variance of all measures obtained under conditions of noise, white field, ascending frequency).	.13
Flicker fusion (variance of all measures obtained under conditions of noise, white field, descending frequency).	.14

Table 14 (continued)

Variable	Correlation with criterion
Flicker fusion (variance of all measures obtained under conditions of noise, black field, ascending frequency).	-.04
Flicker fusion (variance of all measures obtained under conditions of noise, black field, descending frequency).	.18
A-S Reaction Study	-.13
Modified L-C Scale	-.07
Cloe Evaluation Scale	-.02
Cloe Control Scale	-.34*
Circles Test (productivity)	-.26
Circles Test (elaboration)	.27
Circles Test (originality)	-.12
Circles Test (total score)	-.08
Perceptual Reaction Test (No. of extreme responses)	.09
Perceptual Reaction Test (No. of negative responses)	-.11
Hackett Scale	-.16
Altus Scale	-.03

*Probability .05.

In order to determine something of the relationship between certain study variables, 24 previously determined study variables were intercorrelated. These results are shown in Table 15.

Discussion

As previously mentioned, certain study variables did not conform to the assumptions of normality and homogeniety of variance. In this connection, the studies of Pearson (1929, 1931, 1932), Dunlap (1931) and Rider (1932) are cited. Each of these studies indicates the effect of violations of assumptions such as occurred in this study to be relatively inconsequential, making the reported correlations, intercorrelations and factor analysis more defensible.

Point biserial correlations between the 73 study variables and the overachievement - average achievement variable produced only one correlation which was significant at the .05 level. This is less than would be expected by chance. The lack of significance might be explained to some extent by the low (.456) multiple correlation between predictors and the obtained GPA, thus allowing for much error in assigning _Ss_ to the criterion groups. These results may also indicate that differences between overachieving _Ss_ and average _Ss_ may be more subtle, and therefore more difficult to research, than differences between aberrated _Ss_

Table 15

Intercorrelations of 24 Study Variables

	Variable																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Overachievement - Normality																								
2. Grade point average minus predicted grade point average	.95																							
3. HR-basal measure 1	-.20	-.17																						
4. HR-induced measure 1	.23	.17	-.40																					
5. HR-recovery quotient 1	.29	.25	-.07	.69																				
6. GSR-basal measure	-.02	-.05	-.20	.15	-.01																			
7. GSR-induced measure 1	.03	.01	-.20	.17	.16	.72																		
8. GSR-recovery quotient 1	.25	.30	-.07	.12	.16	.23	.35																	
9. PSI-basal measure	-.14	-.12	.25	.01	.13	-.21	-.16	.03																
10. PSI-induced measure 1	.24	.23	-.17	-.17	-.04	.16	.09	.09	-.24															
11. PSI-recovery quotient	.02	.06	.23	.08	-.28	-.12	-.01	-.12	-.02	.26														
12. No. of responses on irrelevant bulb	.21	.27	-.07	.16	-.02	.04	-.12	-.02	-.09	-.06	-.10													
13. Flicker fusion-mean on all thresholds	-.07	.02	-.04	-.14	-.33	.14	.12	-.15	-.45	-.02	-.33	.27												
14. Flicker fusion-variance all thresholds	.17	.21	-.17	.01	-.01	-.20	.20	.12	-.38	-.11	-.22	.23	.55											
15. A-S Reaction Study	-.13	-.05	.04	-.42	-.36	-.07	-.03	-.08	-.11	.27	.10	-.21	.13	-.05										
16. Modified L-C Scale	-.07	-.12	-.02	-.11	.11	.23	.20	.10	.06	.08	.11	-.29	-.11	-.02	.13									
17. Cloe Evaluation Scale	-.02	-.08	.07	.01	-.17	.11	.37	.16	-.20	.27	.28	-.21	-.22	-.21	.23	.23								
18. Circles Test - productivity	-.26	-.13	-.07	-.02	-.17	-.04	-.09	-.07	-.04	-.04	-.12	.08	.17	-.20	.41	-.24	-.14							
19. Circles Test - elaboration	.27	.16	.07	.01	.12	-.05	.18	.13	-.19	.19	.14	.17	-.07	-.40	-.12	-.08	.10	-.27						
20. Circles Test - originality	-.12	-.03	-.07	.10	-.03	-.01	-.11	-.12	-.26	-.09	-.05	.18	.23	.14	.25	-.02	-.05	.78	-.17					
21. Perceptual Reaction Test - No. of committed responses	.09	.09	.30	.08	-.18	-.15	-.05	.07	.03	-.11	-.02	-.19	-.31	.12	-.07	-.23	-.01	.05	.13	-.04				
22. Perceptual Reaction Test - No. of negative responses	-.11	-.13	.12	.03	.10	-.28	-.22	-.17	.09	-.07	-.03	-.28	.04	.22	-.19	-.26	.10	.22	.16	.25	.27			
23. Hackett Scale	-.16	-.25	.04	-.08	-.01	.01	-.11	-.02	-.17	-.24	-.21	-.03	-.15	.02	-.20	.22	.07	-.03	.08	.11	.11	.04		
24. Altus Scale	-.03	-.11	.17	.11	-.05	-.16	-.24	-.02	.01	-.22	-.21	.01	-.04	-.07	-.49	-.16	-.11	-.42	-.13	-.29	.17	-.15	.12	

and average Ss. Finally, these results may indicate a different level of difficulty with which researchers can select a population possessing variability on various tests (of creativity, conformity, etc.) and associate this with variability in positive behavior, as compared to working in the other direction by selecting a population possessing variability in positive behavior and associating this with variability on tests.

The question of the relationship between behavioral systems is assessed to some extent by the intercorrelations. The fact that only 12 significant correlations were found in the intercorrelations of 24 study variables, and that this is no greater than would be expected by chance, fails to support a relationship between behavioral systems.

APPENDIX D

RAW DATA

RAW DATA

S's No.	Group	Scholastic Aptitude Test-Verbal	Scholastic Aptitude Test-Math	Predicted Grade Point Avg.	Grade Point Avg.	GPA Minus PGA
24	N	513	590	2.079	2.000	-.079
19	O	628	603	2.331	3.147	.816
8	O	499	456	1.703	3.176	1.473
16	N	553	562	2.082	2.200	.118
22	O	470	423	1.563	2.625	1.062
21	N	449	456	1.609	1.853	.244
7	N	321	582	1.693	1.869	.176
27	N	527	498	1.866	1.938	.072
5	O	342	540	1.624	2.633	1.009
23	N	385	481	1.553	1.441	-.112
4	N	378	640	1.952	2.031	.079
9	O	541	648	2.283	3.294	1.011
17	O	463	582	1.693	3.000	1.037
14	O	510	514	1.875	2.941	1.066
37	N	470	448	1.628	1.647	.019
12	O	513	481	1.796	3.059	1.263
35	N	406	439	1.482	1.323	-.159
30	O	435	490	1.670	3.029	1.359
36	N	463	481	1.701	1.419	-.282
20	N	422	481	1.623	1.484	-.139
36	O	385	464	1.508	2.656	1.148
24	N	506	540	1.935	2.147	.212
31	O	350	490	1.509	2.567	1.058
15	O	534	590	2.119	3.265	1.146
2	O	435	464	1.602	3.563	1.961
28	N	541	657	2.306	2.382	.076
11	N	630	547	2.189	2.123	-.066
3	O	422	511	1.710	2.676	.966
13	N	449	498	1.718	1.794	.076
34	O	499	487	1.784	3.265	1.481
18	O	449	598	1.978	3.324	1.346
33	N	626	573	2.249	2.029	-.220
38	O	357	473	1.157	2.567	1.410
40	O	456	448	1.601	2.787	1.186
6	N	419	472	1.593	1.437	-.156
1	O	413	640	2.019	2.971	.952
10	N	406	540	1.745	1.764	.019
29	O	480	517	1.636	2.912	1.276
39	N	456	556	1.882	1.647	-.235
32	N	442	339	1.291	1.167	-.124

Note: Under group N = Normal and O = Overachieving.

S's No.	Group	Perceptual Reaction Test-Committed	Perceptual Reaction Test-Negative	Hackett Scale	Altus Scale
24	N	9	25	7	6
19	O	24	34	11	11
8	O	21	33	6	7
16	N	3	17	8	9
22	O	17	24	10	14
21	N	5	24	10	15
7	N	19	27	5	10
27	N	20	26	9	13
5	O	26	25	10	10
23	N	6	35	11	9
4	N	14	24	9	13
9	O	18	26	4	12
17	O	13	36	5	11
14	O	41	38	8	8
37	N	37	26	12	13
12	O	34	37	9	11
35	N	12	28	8	17
30	O	22	29	7	12
36	N	10	26	10	15
20	N	21	31	4	12
36	O	20	35	8	16
24	N	13	45	9	6
31	O	15	18	9	17
15	O	10	33	10	8
2	O	14	25	6	7
28	N	11	35	8	9
3	O	6	27	6	10
11	N	29	46	11	15
13	N	10	24	8	9
34	O	13	29	8	8
18	O	27	26	11	16
33	N	0	30	10	7
38	O	8	32	4	17
40	O	19	21	7	15
6	N	7	24	9	13
1	O	13	24	13	14
10	N	28	37	5	15
29	O	10	25	7	12
39	N	17	33	11	14
32	N	35	45	10	10

S's No.	Group	Modified L-C Scale	Cloe Evaluation Scale	Cloe Control Scale	A-S Reaction Scale
24	N	19	19	24	16
19	O	17	19	23	-13
8	O	19	22	24	2
16	N	21	21	24	30
22	O	16	14	22	-5
21	N	19	20	24	3
7	N	16	11	23	-7
27	N	17	19	22	16
5	O	17	20	23	26
23	N	19	20	22	-6
4	N	16	19	23	14
9	O	17	21	18	35
17	O	16	19	19	-23
14	O	16	17	23	-1
37	N	14	18	23	14
12	O	19	22	23	-20
35	N	18	16	23	-32
30	O	19	18	23	4
36	N	20	22	24	13
20	N	15	18	23	9
36	O	17	17	21	-10
24	N	16	20	24	22
31	O	18	21	23	-42
15	O	18	21	24	-4
2	O	14	12	20	9
28	N	15	19	24	-8
11	N	16	17	19	-35
3	O	18	21	23	4
13	N	19	21	21	4
34	O	20	20	23	34
18	O	18	15	19	-29
33	N	21	15	21	6
38	O	14	20	22	-10
40	O	17	14	23	-35
6	N	19	14	24	-18
1	O	18	19	19	-13
10	N	17	20	23	14
29	O	19	12	18	27
39	N	17	21	22	8
32	N	18	16	24	-24

S's No.	Group	Circles Test-Productivity	Circles Test-Elaboration	Circles Test-Originality	Circles Test Total
24	N	22	1.04	3	60
19	O	17	1.88	3	74.5
8	O	18	1.16	0	43.5
16	N	23	1.00	6	73
22	O	22	1.00	4	60.5
21	N	13	1.33	1	48.5
7	N	22	1.23	0	58.5
27	N	21	1.43	6	95
5	O	11	1.36	1	46.5
23	N	25	1.12	6	83
4	N	25	.84	4	58.5
9	O	13	1.30	0	39.5
17	O	18	1.05	3	52
14	O	27	1.90	5	104.5
37	N	30	1.00	0	47.5
12	O	15	1.07	4	49.5
35	N	11	1.00	0	14.5
30	O	15	1.13	5	56.5
36	N	17	1.21	3	57.5
20	N	21	1.33	2	72
36	O	9	1.00	2	23.5
31	O	6	1.16	0	25.5
24	N	58	1.00	21	36.5
15	O	11	1.73	1	52.2
2	O	34	1.17	8	98
28	N	12	1.58	1	52.5
11	N	17	1.06	1	40
3	O	18	1.66	0	62
13	N	19	1.15	6	76
34	O	16	1.31	2	52.5
18	O	17	1.23	4	65
33	N	19	1.26	5	79.5
38	O	15	1.20	3	51.5
40	O	15	1.55	5	74.5
6	N	18	1.00	1	38
1	O	20	1.35	6	91.5
10	N	31	1.00	5	73.5
29	O	27	.90	7	75.5
39	N	18	1.22	6	78.5
32	N	12	1.58	4	66

S's No.	Group	Flicker Fusion-Mean all Thresholds	Flicker Fusion-Variance all Thresholds	Flicker Fusion-Mean all Ascending Thresholds	Flicker Fusion-Variance all Ascending Thresholds
24	N	62.50	20.57	65.08	22.93
19	O	49.70	24.12	54.08	5.90
8	O	49.83	9.79	52.50	3.72
16	N	52.95	14.40	58.41	5.06
22	O	57.62	28.76	60.66	31.51
21	N	57.62	27.64	60.83	28.87
7	N	53.54	8.52	55.58	4.62
27	N	60.79	39.18	65.75	34.93
5	O	53.00	18.60	56.58	8.81
23	N	61.83	21.69	67.66	62.44
4	N	54.37	6.85	56.58	2.08
9	O	50.37	11.33	53.91	6.08
17	O	59.74	28.10	60.75	22.20
14	O	48.61	63.43	54.41	42.45
37	N	56.40	26.92	60.21	18.53
12	O	50.12	15.33	53.66	3.87
35	N	54.20	31.98	57.74	27.63
30	O	62.08	61.70	69.16	53.15
36	N	53.75	8.70	55.91	5.36
20	N	59.67	12.05	61.41	10.90
36	O	60.45	25.10	63.66	5.63
24	N	60.54	27.04	64.16	60.72
31	O	56.58	24.08	60.41	12.62
15	O	49.29	10.78	52.16	3.33
2	O	66.45	52.04	72.42	27.69
28	N	61.83	36.31	66.58	25.72
11	N	50.75	14.71	53.75	.56
3	O	65.95	51.43	69.66	11.53
13	N	48.63	22.33	52.41	6.44
34	O	61.20	55.84	65.83	7.42
18	O	58.79	28.89	57.58	8.81
33	N	53.58	44.60	63.25	44.38
38	O	56.40	26.92	60.21	18.53
40	O	56.40	26.92	60.21	18.53
6	N	51.70	12.12	54.66	4.42
1	O	54.75	12.54	57.83	3.69
10	N	53.29	8.38	55.83	1.78
29	O	60.29	18.15	63.75	9.09
39	N	56.40	26.92	60.21	18.53
32	N	65.20	73.46	73.46	50.75

S's No.	Group	Flicker Fusion-Mean all Descending Thresholds	Flicker Fusion-Variance all Descending Thresholds	Flicker Fusion-Mean all no noise Thresholds	Flicker Fusion-Variance all no noise Thresholds
24	N	59.91	7.35	61.67	24.97
19	O	45.33	2.78	50.67	22.60
8	O	47.16	1.24	49.41	11.72
16	N	47.50	2.27	51.91	19.72
22	O	54.58	48.93	54.08	31.51
21	N	54.41	6.44	55.50	22.27
7	N	51.50	4.09	53.83	9.97
27	N	56.33	1.17	58.66	11.72
5	O	49.41	2.08	50.83	17.79
23	N	56.00	2.72	58.50	25.18
4	N	52.16	.69	54.75	14.33
9	O	46.83	.69	49.75	30.08
17	O	58.00	5.45	57.75	18.20
14	O	42.41	5.90	48.41	42.44
37	N	52.53	6.10	61.35	29.14
12	O	46.58	.72	49.99	11.63
35	N	51.16	23.45	54.91	60.97
30	O	56.00	2.06	61.91	77.97
36	N	51.58	11.87	54.08	10.33
20	N	56.91	2.44	59.16	7.90
36	O	54.75	4.38	59.83	35.06
24	N	56.91	2.08	59.56	13.00
31	O	52.75	6.56	56.25	34.56
15	O	46.41	1.17	49.16	2.92
2	O	60.50	9.11	66.08	57.60
28	N	57.08	.99	61.16	50.69
11	N	47.75	1.47	51.16	20.87
3	O	62.33	7.33	63.75	38.15
13	N	44.83	2.87	47.75	19.47
34	O	56.58	30.78	62.69	89.50
18	O	48.00	.62	51.91	22.08
33	N	53.91	1.35	58.16	55.42
38	O	52.53	6.10	61.35	29.14
40	O	52.53	6.10	61.35	29.14
6	N	48.75	1.84	51.00	12.26
1	O	51.66	1.69	54.51	13.17
10	N	50.74	.75	52.83	8.33
29	O	56.85	9.29	59.83	25.36
39	N	52.53	6.10	61.35	29.14
32	N	57.33	5.06	65.56	79.33

S's No.	Group	Flicker Fusion-Mean all noise Thresholds	Flicker Fusion-Variance all noise Thresholds	Flicker Fusion-Mean all Black Field Thresholds	Variance all Black Field Thresholds
24	N	65.83	24.97	63.83	24.99
19	O	48.75	25.84	49.75	21.29
8	O	50.26	8.38	49.41	7.17
16	N	54.00	28.56	51.58	30.44
22	O	61.16	25.24	59.08	20.81
21	N	59.75	25.80	58.41	15.90
7	N	53.25	7.47	53.66	9.33
27	N	63.41	59.17	61.58	50.44
5	O	53.17	21.07	52.75	18.56
25	N	65.15	88.62	61.75	59.84
4	N	55.99	1.09	54.33	7.78
9	O	50.99	21.27	50.66	20.06
17	O	61.00	7.81	60.24	4.20
14	O	48.41	89.87	47.75	94.78
37	N	56.98	29.62	56.62	29.92
12	O	50.25	37.50	50.41	16.81
35	N	53.49	14.53	54.58	50.26
30	O	62.75	51.15	63.92	70.06
36	N	55.41	7.35	53.83	8.87
20	N	59.41	16.32	58.83	11.42
36	O	58.58	25.54	61.16	33.08
24	N	61.58	41.17	61.25	34.94
31	O	56.91	16.44	56.50	28.09
15	O	49.41	10.44	49.50	15.54
2	O	66.83	50.75	67.33	58.02
28	N	62.50	24.27	61.75	24.02
11	N	50.33	9.51	50.75	22.93
3	O	68.25	67.11	68.42	54.81
13	N	49.50	25.52	49.25	24.56
34	O	59.50	27.00	59.58	69.97
18	O	53.66	36.81	53.08	32.54
33	N	58.99	28.36	57.91	20.99
38	O	56.98	29.62	56.62	29.92
40	O	56.98	29.62	56.62	29.92
6	N	52.33	12.24	51.83	14.91
1	O	55.08	12.81	54.83	19.78
10	N	53.74	7.84	53.24	8.55
29	O	60.75	10.93	61.25	7.06
39	N	56.78	29.62	56.62	29.92
32	N	64.91	97.81	64.41	65.26

S's No.	Group	Flicker Fusion-Mean all White Field Thresholds	Flicker Fusion-Variance all White Field Thresholds	Flicker Fusion-Mean all no noise Black Field Ascending Thresholds	Flicker Fusion-Variance all no noise Black Field Ascending Thresholds
24	N	61.16	14.08	65.67	.33
19	O	49.66	29.15	54.67	1.33
8	O	50.25	12.02	51.67	2.28
16	N	54.35	17.72	55.00	7.00
22	O	56.16	35.60	58.00	3.00
21	N	56.83	40.51	61.00	1.00
7	N	53.41	8.44	57.33	.33
27	N	60.50	31.11	62.67	1.33
5	O	53.25	20.18	57.67	2.35
23	N	61.91	76.42	62.00	13.00
4	N	54.41	6.26	57.35	2.35
9	O	50.08	13.90	54.33	2.33
17	O	58.50	25.60	62.33	4.33
14	O	49.08	28.56	54.00	13.00
37	N	56.17	28.41	60.38	10.63
12	O	49.83	14.12	54.33	1.33
35	N	53.83	16.51	62.00	103.00
30	O	61.24	57.51	73.67	.33
36	N	53.66	9.11	57.33	.35
20	N	59.50	23.53	62.00	1.00
36	O	59.75	18.61	64.00	21.00
24	N	59.83	19.60	63.33	8.33
31	O	56.66	23.15	61.33	8.33
15	O	49.08	66.90	53.67	2.33
2	O	65.58	38.24	74.67	2.33
28	N	61.91	46.17	65.67	2.33
11	N	50.75	7.84	58.67	22.33
3	O	63.58	52.54	67.67	33.33
13	N	48.00	21.27	52.67	12.74
34	O	62.83	46.24	65.67	1.33
18	O	52.50	27.72	57.67	4.33
33	N	59.25	71.29	60.67	33.33
38	O	56.17	28.41	60.38	10.68
40	O	56.17	28.41	60.38	10.68
6	N	51.58	10.81	55.00	4.00
1	O	54.66	6.42	58.67	8.39
10	N	53.35	8.24	55.33	2.33
29	O	59.33	29.53	63.33	22.33
39	N	56.17	28.41	60.38	10.68
32	N	66.00	108.72	75.00	22.33

S's No.	Group	Flicker Fusion-Mean all no noise Black Field Descending Thresholds	Flicker Fusion-Variance all no noise Black Field Descending Thresholds	Flicker Fusion-Mean no noise White Field Ascending Thresholds	Flicker Fusion-Variance all no noise White Field Ascending Thresholds
24	N	62.33	11.00	59.67	30.33
19	O	46.33	1.35	54.67	20.33
8	O	47.00	.00	52.67	14.35
16	N	47.67	1.33	56.67	4.53
22	O	53.00	.00	54.00	3.00
21	N	55.67	.33	53.67	37.33
7	N	51.33	2.35	53.67	10.35
27	N	55.67	.33	60.33	14.33
5	O	49.00	3.00	54.35	22.33
23	N	55.67	2.33	61.35	58.33
4	N	51.67	1.33	57.33	1.33
9	O	46.67	.33	50.67	6.33
17	O	58.00	1.00	54.67	25.33
14	O	41.33	4.35	53.67	3.33
37	N	52.25	2.39	58.15	32.18
12	O	47.33	.33	51.33	6.33
35	N	47.67	.33	57.33	1.33
30	O	56.67	2.33	64.00	139.00
36	N	51.35	1.33	54.67	5.33
24	N	57.67	1.33	59.00	27.00
20	N	57.00	1.00	58.67	16.33
36	O	53.67	.33	64.00	3.00
31	O	51.67	17.33	60.00	43.00
15	O	46.00	1.00	50.33	5.33
2	O	60.33	.33	67.67	102.33
28	N	56.67	.33	66.33	34.33
11	N	47.33	1.33	52.33	8.33
3	O	58.67	8.33	69.00	12.33
13	N	44.67	.33	51.00	7.00
34	O	53.00	.00	69.00	12.00
18	O	48.00	1.00	54.00	3.00
33	N	54.33	2.35	65.00	168.50
38	O	52.25	2.39	58.15	32.18
40	O	52.25	2.39	58.15	32.18
6	N	48.67	.33	52.67	10.33
1	O	51.00	3.00	56.00	3.00
10	N	50.33	1.33	55.33	4.33
29	O	59.67	10.33	65.00	9.00
39	N	52.25	2.59	58.15	32.18
32	N	58.00	1.00	69.67	131.33

S's No.	Group	Flicker Fusion-Mean all no noise White Field Descending Thresholds	Flicker Fusion-Variance all no noise White Field Descending Thresholds	Flicker Fusion-Mean all noise Black Field Ascending Thresholds	Flicker Fusion-Variance all noise Black Field Ascending Thresholds
24	N	59.00	.00	69.00	21.00
19	O	47.00	.00	53.33	1.33
8	O	46.33	1.33	52.33	1.33
16	N	43.33	1.35	58.00	4.00
22	O	51.33	4.33	67.33	.33
21	N	51.67	10.33	63.00	.00
7	N	53.00	13.00	55.33	1.33
27	N	56.00	3.00	71.33	42.33
5	O	50.33	.33	55.67	.33
23	N	55.00	4.00	73.00	19.00
4	N	52.67	.33	56.33	1.33
9	O	47.33	1.33	55.33	1.33
17	O	56.00	19.00	61.33	5.33
14	O	44.67	12.33	55.00	198.83
37	N	52.63	3.77	61.33	4.98
12	O	47.00	1.00	54.33	1.33
35	N	52.67	.33	56.33	1.33
30	O	55.33	1.00	69.67	30.33
36	N	53.00	5.33	55.67	.33
24	N	58.00	4.00	68.33	34.75
20	N	58.00	4.00	61.00	13.00
36	O	57.67	2.33	63.67	4.33
31	O	52.00	1.33	60.67	5.33
15	O	46.67	.33	52.67	.33
2	O	61.67	4.33	74.67	.33
28	N	56.00	1.00	67.00	1.00
11	N	48.33	1.33	52.33	1.33
3	O	59.67	8.33	71.67	4.33
13	N	42.67	2.33	54.67	1.33
34	O	64.00	3.00	65.00	4.00
18	O	48.00	1.00	59.00	1.00
33	N	52.07	1.33	62.33	1.33
38	O	52.63	3.77	61.13	4.98
40	O	52.63	3.77	61.13	4.98
6	N	48.00	3.00	55.67	.33
1	O	52.00	1.00	59.00	1.00
10	N	50.33	.33	56.35	1.33
29	O	53.33	9.33	64.67	1.33
39	N	52.63	3.77	61.13	4.98
32	N	59.33	6.33	70.00	7.00

S's No.	Group	Flicker Fusion-Mean all noise Black Field Descending Thresholds	Flicker Fusion-Variance all noise Black Field Descending Thresholds	Flicker Fusion-Mean all noise White Field Ascending Thresholds	Flicker Fusion-Variance all noise White Field Ascending Thresholds
24	N	58.33	2.33	66.00	1.00
19	O	44.67	1.33	53.67	2.33
8	O	46.67	.33	53.33	.33
16	N	45.67	.33	64.00	3.00
22	O	58.00	.00	63.33	12.33
21	N	54.00	4.00	65.67	1.33
7	N	50.67	1.33	56.00	3.00
27	N	56.67	1.33	68.67	17.33
5	O	48.67	1.33	58.67	6.33
23	N	56.33	5.33	74.33	54.33
4	N	52.00	1.00	55.33	4.33
9	O	46.33	1.33	55.33	1.33
17	O	59.33	.33	64.67	4.33
14	O	40.67	.35	55.00	12.00
37	N	52.72	1.12	61.35	5.11
12	O	45.67	.33	54.67	1.33
35	N	52.33	.33	55.33	2.33
30	O	55.67	1.33	69.33	.33
36	N	51.00	1.00	56.00	3.00
20	N	55.33	2.33	64.00	7.00
36	O	53.33	1.33	63.00	1.00
24	N	55.67	.33	66.00	.00
31	O	52.33	1.33	59.67	10.33
15	O	45.67	.33	52.00	1.00
2	O	59.67	.33	72.67	.33
28	N	57.67	.33	67.33	1.33
11	N	46.67	1.33	53.67	1.33
3	O	75.67	2.33	70.33	.33
13	N	45.00	1.00	51.33	2.33
34	O	54.67	.33	63.67	1.33
18	O	47.67	.33	59.67	1.33
33	N	54.33	.33	65.00	19.00
38	O	52.72	1.12	61.35	5.11
40	O	52.72	1.12	61.35	5.11
6	N	48.00	1.00	55.33	1.35
1	O	50.67	.33	57.67	.33
10	N	51.00	.00	56.33	.33
29	O	57.33	2.33	64.00	4.00
39	N	52.72	1.12	61.35	5.11
32	N	54.67	1.33	77.67	1.33

S's No.	Group	Flicker Fusion-Mean all noise White Field Descending Thresholds	Flicker Fusion-Variance all noise White Field Descending Thresholds	Number of Lines Read
24	N	66.00	.00	81.25
19	O	43.33	.33	65.25
8	O	48.67	.33	94.25
16	N	48.33	2.33	76.00
22	O	56.00	7.00	96.50
21	N	56.33	1.33	90.72
7	N	51.00	1.00	83.25
27	N	57.00	.00	78.25
5	O	49.67	4.33	70.15
23	N	57.00	.00	83.25
4	N	52.33	.33	55.00
9	O	47.00	.00	93.25
17	O	58.67	.33	59.25
14	O	43.00	1.00	62.50
37	N	52.77	1.21	92.25
12	O	46.33	.33	83.75
35	N	52.00	1.00	73.75
30	O	56.33	4.33	88.50
36	N	51.00	1.00	80.00
20	N	54.33	.33	100.50
36	O	54.33	2.33	104.50
24	N	56.33	.33	120.75
31	O	55.00	4.00	87.00
15	O	47.33	2.33	68.75
2	O	60.33	2.33	106.75
28	N	50.00	.00	72.75
11	N	48.67	.33	108.50
3	O	55.33	.33	121.75
13	N	47.00	1.00	96.12
34	O	54.67	1.33	83.25
18	O	48.33	.33	58.25
33	N	54.33	.33	77.25
38	O	52.77	1.21	57.50
40	O	52.77	1.21	57.50
6	N	50.33	.33	102.00
1	O	53.00	.00	75.25
10	N	51.33	1.33	108.50
29	O	57.00	1.00	55.25
39	N	52.77	1.21	63.75
32	N	57.33	.33	74.25

S's No.	Group	Heart Rate Basal Measure 1	Heart Rate Basal Measure 2	Heart Rate Induced Measure 1	Heart Rate Induced Measure 2	Heart Rate Induced Measure 3
24	N	79.57	16.52	11.22	17.25	14.47
19	O	88.50	25.70	41.93	-24.70	33.92
8	O	82.24	3.09	17.24	77.57	17.32
16	N	74.58	26.30	29.26	10.74	31.15
22	O	57.77	6.76	50.22	19.48	37.57
21	N	88.67	2.63	16.07	4.62	-.35
7	N	79.04	44.24	16.30	-37.94	10.83
27	N	88.95	54.63	20.79	-53.63	20.51
5	O	84.94	68.72	24.15	-64.42	20.56
23	N	55.94	124.93	16.49	-49.93	30.17
4	N	80.34	33.66	12.68	42.18	3.66
9	O	102.82	2.30	3.73	27.68	-2.53
17	O	62.06	4.76	38.12	2.95	33.89
14	O	65.89	14.87	25.96	18.92	24.37
37	N	94.83	7.21	9.44	17.13	5.04
12	O	83.68	13.75	49.65	-12.15	47.71
35	N	82.91	7.10	15.90	51.51	9.61
30	O	63.99	34.19	26.60	22.47	8.94
36	N	84.75	10.05	-1.15	70.71	2.58
20	N	86.81	37.23	32.04	-21.94	23.09
36	O	91.68	7.96	16.29	17.99	13.58
24	N	80.03	20.69	24.90	-.41	19.18
31	O	66.51	20.62	48.63	-16.32	34.72
15	O	70.96	4.49	12.63	11.18	7.62
2	O	77.97	59.13	21.48	-16.55	13.86
28	N	69.23	17.05	17.78	11.85	16.17
11	N	92.49	5.59	34.72	24.57	20.80
3	O	57.58	29.02	34.72	-13.20	23.82
13	N	80.80	43.43	48.87	-9.29	31.43
34	O	58.41	17.29	9.43	17.88	8.47
18	O	89.10	1.69	11.31	7.71	10.92
33	N	63.91	87.21	28.82	-66.69	20.85
38	O	63.64	30.17	42.81	68.39	33.83
40	O	79.02	30.23	32.64	-11.06	23.29
6	N	68.92	22.87	35.46	-8.56	26.40
1	O	79.70	15.96	35.22	-1.98	29.57
10	N	68.29	14.61	39.29	12.58	20.74
29	O	84.88	25.05	15.48	-5.69	13.81
39	N	67.40	18.66	12.93	-8.80	3.26
32	N	101.52	11.04	20.53	-8.15	13.09

S's No.	Group	Heart Rate Induced Measure 4	Heart Rate Adaptation Quotient	Heart Rate Recovery Quotient 1	Heart Rate Recovery Quotient 2	Heart Rate Recovery Quotient 3
24	N	17.56	-3.41	2.32	9.91	65.50
19	O	41.93	18.60	32.47	32.47	82.50
8	O	21.96	4.49	14.27	14.27	82.50
16	N	33.17	-1.75	17.41	17.41	82.50
22	O	50.22	28.89	9.88	9.88	82.50
21	N	16.07	34.06	3.53	3.53	82.50
7	N	16.30	10.37	.50	4.33	78.50
27	N	20.79	.65	1.57	19.82	42.50
5	O	24.15	11.15	.76	.76	82.50
23	N	40.58	-16.96	2.29	11.28	65.00
4	N	12.68	16.30	1.40	1.40	82.50
9	O	3.73	16.14	-3.92	-3.45	80.50
17	O	38.12	3.35	18.29	18.29	82.50
14	O	25.96	1.22	18.05	18.05	82.50
37	N	9.44	7.00	1.44	1.44	82.50
12	O	49.65	2.90	32.11	32.11	82.50
35	N	15.90	7.63	6.89	7.13	78.00
30	O	26.60	26.26	4.11	4.11	82.50
36	N	9.45	-2.08	-3.62	-1.36	75.50
20	N	32.04	10.88	5.41	8.27	67.50
36	O	16.29	4.49	15.89	16.09	79.50
24	N	24.90	10.18	3.38	3.51	80.50
31	O	48.63	25.95	14.71	14.71	82.50
15	O	12.63	5.66	-.09	-.09	82.50
2	O	24.48	22.56	-1.60	6.14	63.50
28	N	17.78	1.90	12.33	12.43	75.50
11	N	34.72	8.54	7.15	7.15	82.50
3	O	34.72	16.05	11.20	11.20	82.50
13	N	48.87	23.97	21.05	31.14	77.50
34	O	9.43	2.61	2.16	2.16	82.50
18	O	11.96	1.62	8.19	8.19	82.50
33	N	28.82	11.32	8.92	8.92	82.50
38	O	42.81	12.76	16.38	16.38	82.50
40	O	32.64	17.61	3.50	6.46	79.50
6	N	35.46	18.17	8.24	8.24	82.50
1	O	35.22	11.78	13.73	17.46	65.50
10	N	39.39	28.90	5.66	5.66	82.50
29	O	15.48	2.60	7.44	7.44	82.50
39	N	12.93	19.35	-7.85	-7.85	82.50
32	N	20.53	9.91	4.62	7.74	79.00

S's No.	Group	Galvanic Skin Response Basal Measure	Galvanic Skin Response Induced Measure 1	Galvanic Skin Response Induced Measure 2	Galvanic Skin Response Induced Measure 3
24	N	221,800	130,000	128,800	130,000
19	O	100,000	53,600	47,800	-53,600
8	O	137,200	70,800	79,800	87,200
16	N	207,600	150,400	142,533	150,400
22	O	75,400	25,400	25,800	28,400
21	N	211,000	98,600	97,400	98,600
7	N	120,600	81,800	79,400	90,600
27	N	69,000	36,000	30,200	36,000
5	O	109,200	53,200	48,933	54,400
23	N	169,400	74,600	88,533	95,800
4	N	39,200	10,800	7,667	10,800
9	O	49,400	31,000	27,467	31,000
17	O	151,200	76,000	67,200	70,200
14	O	96,000	72,000	65,067	72,000
37	N	59,000	30,800	27,800	30,800
12	O	66,400	37,000	28,734	37,000
35	N	99,000	49,000	45,800	49,000
30	O	-188,500	81,800	87,467	95,200
36	N	57,600	-1,200	334	2,400
20	N	104,600	66,800	63,533	66,800
36	O	47,000	19,400	17,200	19,400
24	N	109,400	62.400	61,000	62,400
31	O	167,000	145,000	122,933	145,000
15	O	85,800	55,200	52,200	55,200
2	O	110,000	9,400	3,467	9,400
28	N	94,200	84,800	63,600	84,800
11	N	70,600	38,800	31,800	38,800
3	O	188,000	144,000	27,600	144,000
13	N	44,600	40,900	39,800	40,900
34	O	123,400	52,800	58,634	58,200
18	O	85,800	44,200	44,000	44,800
33	N	60,000	29,400	26,000	29,400
38	O	44,000	37,600	37,600	37,600
40	O	79,000	52,000	36,267	52,000
6	N	131,200	99,000	88,400	99,000
1	O	127,000	86,400	73,267	86,400
10	N	65,800	46,200	42,867	46,200
29	O	84,000	57,000	51,800	57,000
39	N	95,400	65,400	59,000	65,400
32	N	16,000	8,400	7,900	8,400

S's No.	Group	Galvanic Skin Response Adaptation Quotient	Galvanic Skin Response Recovery Quotient 1	Galvanic Skin Response Recovery Quotient 2	Galvanic Skin Response Recovery Quotient 3
24	N	3,000	-19,400	-13,400	75
19	O	-10,800	-3,000	4,800	62
8	O	-10,600	33,000	27,000	64
16	N	19,400	17,600	17,600	90
22	O	1,800	1,800	2,700	86
21	N	1,800	41,200	41,200	90
7	N	16,000	2,400	9,600	81
27	N	9,600	0	3,900	56
5	O	14,000	9,000	9,000	90
23	N	-20,600	-3,600	-3,000	87
4	N	6,400	3,600	4,200	86
9	O	5,000	2,400	5,400	56
17	O	600	7,800	9,600	85
14	O	6,000	3,600	4,800	60
37	N	6,000	-4,800	1,200	54
12	O	15,400	1,450	2,600	65
35	N	5,400	600	1,800	22
30	O	-3,600	-1,400	-1,400	90
36	N	-3,600	3,600	6,600	56
20	N	8,000	-15,800	-15,200	71
36	O	6,000	0	0	90
24	N	3,600	8,400	8,400	90
31	O	-28,000	49,800	49,800	90
15	O	4,200	-600	5,400	54
2	O	14,400	15,000	16,200	66
28	N	27,000	3,000	3,000	90
11	N	12,600	-1,800	5,600	57
3	O	29,000	3,400	13,400	90
13	N	1,800	-1,200	-1,200	90
34	O	-5,400	-2,400	4,800	30
18	O	-600	3,600	3,600	90
33	N	6,000	0	3,600	59
38	O	0	0	600	26
40	O	16,400	-1,400	1,600	80
6	N	15,600	1,600	1,600	90
1	O	23,600	-1,800	7,800	84
10	N	5,000	1,800	1,800	90
29	O	10,800	4,200	9,600	61
39	N	10,200	-3,000	1,800	59
32	N	900	-300	300	56

S's No.	Group	Pneumatic Task Total Time	Pneumatic Task-total of Responses to Relevant Bulb	Pneumatic Task - Total Duration of Responses to Relevant Bulb
24	N	104	244.50	26.0
19	O	92	279.00	107.0
8	O	84	201.00	112.0
16	N	83	350.50	50.5
22	O	65	452.50	36.0
21	N	78	359.00	54.0
7	N	118	265.50	75.0
27	N	74	330.50	54.0
5	O	85	318.00	37.0
23	N	87	363.50	58.0
4	N	64	331.00	53.5
9	O	91	347.50	38.5
17	O	61	482.00	49.5
14	O	95	364.00	64.5
37	N	64	408.50	51.5
12	O	86	361.50	50.5
35	N	64	256.00	32.0
30	O	104	409.50	52.5
36	N	149	473.00	24.5
20	N	65	429.00	32.0
36	O	94	365.00	38.0
24	N	76	170.00	23.0
31	O	105	417.50	39.5
15	O	77	497.00	46.5
2	O	70	374.50	30.0
28	N	87	489.00	57.5
11	N	67	262.00	26.0
3	O	80	318.00	25.5
13	N	60	388.50	25.0
34	O	59	374.50	38.5
18	O	77	309.00	82.0
33	N	58	331.50	28.0
38	O	143	479.50	66.0
40	O	66	245.00	58.5
6	N	92	239.50	84.5
1	O	76	254.00	95.0
10	N	93	471.50	46.0
29	O	67	439.50	32.5
39	N	75	515.50	40.0
32	N	75	530.00	73.5

S's No.	Group	Pneumatic Task - total Number of Responses to Irrelevant Bulb	Pneumatic Task - Total Magnitude of Responses to Irrelevant Bulb	Pneumatic Task Percentile Rank for Activity on Irrelevant Bulb
24	N	6	38	60
19	O	21	359	71
8	O	13	0	49
16	N	2	0	42
22	O	7	0	49
21	N	10	0	53
7	N	3	0	44
27	N	18	289	66
5	O	3	0	29
23	N	12	0	59
4	N	0	0	29
9	O	1	28	38
17	O	17	0	56
14	O	8	68	53
37	N	6	0	36
12	O	0	0	26
35	N	12	0	57.5
30	O	14	65	63
36	N	12	0	57.5
20	N	3	0	29
36	O	5	0	50
24	N	7	0	42
31	O	1	0	34
15	O	0	0	18
2	0	37	432	45.5
28	N	6	0	45.5
11	N	3	0	47
3	O	7	0	42
13	N	4	18	53
34	O	5	0	51
18	O	5	0	48
33	N	5	0	57
38	O	33	202	74
40	O	21	263	64
6	N	16	216	68
1	O	22	0	50
10	N	3	0	56
29	O	3	41	37
39	N	12	0	62
32	N	12	0	55

No.	Group	Palmar Sweat Index Basal Measure	Palmar Sweat Index Induced Measure 1	Palmar Sweat Index Induced Measure 2	Palmar Sweat Index Induced Measure 3	Palmar Sweat Index Adaptation Quotient	Palmar Sweat Index Recovery Quotient
24	N	0	14	21.67	27	-13	9
19	O	16	10	7.00	11	-1	6
8	O	31	10	12.00	17	-5	4
16	N	11	9	20.00	26	-17	19
22	O	0	8	12.33	15	-45	-6
21	N	0	15	13.00	15	4	1
7	N	24	7	4.67	10	-3	4
27	N	6	9	10.00	13	1	11
5	O	14	9	6.67	0	2	-7
23	N	2	29	33.00	36	-5	0
4	N	10	14	16.00	20	-1	16
9	0	10	22	18.33	22	3	25
17	O	5	13	10.67	13	3	-3
14	O	1	17	33.00	48	-12	7
37	N	3	3	3.67	5	0	-5
12	0	1	15	21.33	31	-16	22
35	N	23	-8	-4.33	0	- 8	-1
30	O	0	14	12.00	14	1	7
36	N	1	13	9.67	13	6	6
20	N	0	5	11.33	22	-12	10
36	O	10	9	14.00	17	-8	5
24	N	4	0	.67	1	-1	2
31	O	0	4	2.33	4	4	0
15	O	3	27	27.00			
2	O	3	9	12.00	14	-5	6
28	N	6	12	16.67	26	-14	13
11	N	22	-14	.33	8	-12	7
3	O	6	17	20.33	22	-3	0
13	N	12	4	10.67	18	-14	16
34	O	1	2	3.67	6	-8	3
18	O	10	13	14.67	17	-1	1
33	N	10	0	3.00	9	-8	10
38	O	6	14	20.00	22	-10	16
40	O	4	4	7.33	14	0	2
6	N	20	10	12.00	17	-5	7
1	O	3	1	13.33	23	-22	14
10	N	20	21	12.67	21	11	4
29	O	13	13	12.67	20	8	-5
39	N	3	5	13.33	20	-15	-16
32	N	4	4	7.33	18	0	2

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