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THE EFFECT OF BENZEDRINE SULFATE ON PERSONALITY ADJUSTMENT

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By

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ABSTRACT

The purpose of this study is to determine the effects of benzedrine sulfate on personality adjustment, as measured by two personality tests.

The two personality tests used were the Bell Adjustment Inventory and the Bernreuter Personality test. These tests were administered to ten male college students of Kansas State Teachers College, Pittsburg, Kansas.

The test scores were obtained under three different conditions. A normal score was first obtained; the ten subjects were then divided at random into two groups of five each. The first group of five took ten miligrams of benzedrine sulfate on Monday, while the second group of five was given ten miligrams of lactose. On the following Friday, the second group was given benzedrine while the first group was given lactose, thus a second condition of obtaining a score on the two personality tests after using lactose and a third condition of obtaining a score on the two personality tests while using benzedrine. The procedure of giving lactose and benzedrine was followed for two consecutive weeks.

The results of the experiment showed that ten miligrams of benzedrine sulfate do not affect the personality adjustment, as measured by the Bell Adjustment Inventory or the Bernreuter Personality test.

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CHAPTER I

INTRODUCTION

Statement of the Problem

The purpose of this study is to determine the effect of benzedrine sulfate on personality adjustment, as measured by two personality tests.

From an investigation of the studies already made in which benzedrine sulfate was used, it was found that nearly all experiments mention the exhilaration of mood, the feeling of confidence and talkativeness resulting from its use. With this idea in mind it is obvious that it could be used in the counseling situation to help draw out the counselee. However, in the process of drawing out the individual, the question arises as to whether or not the use of benzedrine sulfate will distort the true picture of personality adjustment and, if so, to what extent. This study is made in an effort to determine the answer to this question.

Need for the Study

Medical men and psychologists may benefit from the use of any method which facilitates recognition of the subject's personality problem. That benzedrine is of value for this purpose has been suggested by several studies.

Nathanson found that the most frequent effect of the ingestion of benzedrine was a sense of well being and a feeling of exhilaration. Also there was lessened fatigue, talkativeness and increased energy and capacity for work. He recognized the possible value of benzedrine when he stated that the observed reactions indicated it might have wide therapeutic application but a more extensive study was needed to determine the exact indications.[1]

Eugene Davidoff and E. C. Reifenstein felt that there was a need for an extensive investigation of benzedrine. They suggested that "it may render depressed or self-absorbed patients more accessible to investigation or psychotherapy."[2]

In counseling much time and effort is spent inducing some subjects to discuss their personal problems, thus rendering them accessible to investigation. The counselor may find that the influence of benzedrine helps to break down the barrier between the counselor and counselee, thus proving worthwhile by saving countless time in determining an individual's particular difficulties. However, before it can be used in the counseling situation, the effects of

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[1]M. H. Nathanson, "The Centeral Action of Beta Aminopropylbenzene (Benzedrine)," Journal of the American Medical Association, CIX (January-March, 1937), 528-531.

[2]Eugene Davidoff and E. C. Reifenstein, "The Stimulating Action of Benzedrine Sulfate," Journal of the American Medical Association, CVIII (April-June, 1937), 1775.

benzedrine on the personality must be determined to see whether or not the personality adjustment is distorted in any way. If it is, of course, this would seriously limit the use of the drug in such situations.

Related Studies

For benzedrine sulfate to be used successfully in the counseling situation, it must first be shown that the drug produces the desired results of overtalkativeness, exhilaration of mood and feeling of self-confidence conducive to easier investigation of the counselee's problem. The following related studies are given to substantiate these reasons for the use of benzedrine.

Bradley and Bowen tried benzedrine on one hundred problem children. On fifty-four noisy, quarrelsome, overboisterous children the medicine had a subduing effect in direct contrast to its stimulating effect on adult patients. They also found that it was stimulating to nineteen seclusive, underactive children, making them appear more alert and interested and able to accomplish their daily tasks with more initiative and dispatch. Apparently its effect is to make the child feel better and more comfortable so that conflicts which are still present are no longer so irritating and distressing that they drive the child into abnormal seclusiveness or equally abnormal activity.[3]

3"Benzedrine Used Successfully In Treating Problem Children," Science News Letter, XXXVII (January-June, 1940), 132-133.

Under clinical observation Wilbur and MacLean found that 78 per cent of their patients improved following the use of benzedrine. In some instances exhaustion completely disappeared. There seemed to be marked exhilaration of mood and increased capacity for physical and mental ability. Dosages given were from two to twenty miligrams daily. Forty-five per cent of the psychoneurotic patients seemed to improve. Fourteen out of twenty patients who had simple depression experienced relief. They concluded that the drug is a stimulant and therefore does not permanently alter a psychotic disorder or state of chronic exhaustion.[4]

Reifenstein and Davidoff studied the effect of benzedrine on ten normal individuals. Of these seven showed elevation of mood, and seven overtalkativeness. They also used as subjects ten depressed manic-depressive patients, two of whom displayed elevation of mood and six overtalkativeness. In investigating twenty-five self-absorbed dementia praecox patients, they found that four manifested elevation of mood and seven overtalkativeness. In general, they found an increase in subjective verbalization and willingness to discuss personal problems.[5]

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[4] D. L. Wilbur and A. R. MacLean, "Clinical Observation of the Effects of Benzedrine Sulfate," Journal of the American Medical Association, CIX (July-September, 1937), 549-554.

[5] Davidoff and Reifenstein, op. cit., pp. 1770-1776.

In another study Reifenstein and Davidoff examined the patients admitted to the Syracuse Psychopathic Hospital in psychotic states brought on by alcohol and found that the subjects suffering from mild states of depression after drinking alcohol respond in a very striking manner to benzedrine sulfate. Out of twenty-eight patients who were subjected to a careful physical and mental examination and then given from ten to thirty miligrams of benzedrine by mouth daily, improvement resulted in 93 per cent of them. Alcoholism is often a manifestation of an underlying psychoneurotic personality; and these writers observed that benzedrine might prove valuable in differentiating the states of depression due to alcohol alone, which are usually rapidly dissipated by the drug, from the states of depression of psychogenic origin, which do not respond as rapidly to the drug.[6]

Prinzmetal and Bloomberg made a study of nine patients with a history of narcolepsy. They administered the benzedrine in amounts varying from ten miligrams once daily to forty miligrams three times daily. They found that there was individual variation in the response to benzedrine and that in the nine cases of narcolepsy, there was a complete

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[6]E. C. Reifenstein, Jr., and Eugene Davidoff, "The Treatment of Alcoholic Psychoses with Benzedrine Sulfate," Journal of the American Medical Association, CX (April-June, 1938), 1811-1812.

relief from attacks of sleep and practically complete relief of catalepsy.[7]

Following the ingestion of various amounts of benzedrine, a total of 166 adults were tested by Turner and Carl for temporary changes in affect and attitude. These writers were also interested in the effects of various amounts of benzedrine on psychomotor responses. The participants were divided into four groups. Three of these groups received various amounts of benzedrine, and the other group received lactose. Then the performance of the groups was compared with one another. The writers included in the testing program personality tests, the optimism-pessimism scale and the Bernreuter Personality test.[8]

These investigators were pretty well convinced from observation of individual reactions and through consideration of findings from other testing devices that temporary alterations in mood actually are induced among many individuals by ingestion of benzedrine and that the modified behavior incident to those changes would be regarded by most lay observors as being in the realm of "changes in personality".[9]

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[7]Myron Prinzmetal and Wilford Bloomberg, "The Use of Benzedrine for the Treatment of Narcolepsy," Journal of the American Medical Association, CV (October-December, 1935), 2051-2052.

[8]G. P. Carl and W. D. Turner, "The Effects of Benzedrine Sulfate (Amphethamine Sulfate) on Performance in Comprehensive Psychometric Examinations," Journal of Psychology, VII-VIII (1939), 165-215.

[9]W. D. Turner and G. P. Carl, "Temporary Changes in Affect and Attitude Following Ingestion of Benzedrine Sulfate," Journal of Psychology, VII-VIII (1939), 415-482.

Nathanson made a study on eighty normal individuals, of whom fifty-five received the drug and twenty-five were given tablets of the same appearance containing lactose. Twenty miligrams of benzedrine sulfate had been given before the noon meal. Each subject received a questionnaire in a sealed envelope with instructions to open the envelope and answer all the questions as carefully as possible in the evening. In more than two-thirds of the subjects the most frequent effect was a sense of well-being and a feeling of exhilaration. Next in order of frequency was a lessened fatigue in 62 per cent, talkativeness in 56 per cent, and increased energy and capacity for work in 54.5 per cent. The results of this study indicate that benzedrine exerts a definite stimulating effect on the higher centers of the centeral nervous system in most individuals.[10]

From these investigations it would appear safe to conclude that benzedrine sulfate has a subduing effect on over-boisterous children, stimulates seclusive children, relieves persons suffering from simple depression, gives a sense of well being and a feeling of self-confidence, and produces an elevation of mood and willingness to talk of personal problems. Even so, as favorable as these indications are for the use of the drug in counseling, the question still arises as to whether these effects

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[10]Nathanson, op. cit., pp. 528-531.

may not bring about alterations in personality adjustment which would invalidate the findings obtained in the counseling situation. This study attempts to shed some light on that question.

CHAPTER II

PROCEDURE, RESULTS, AND CONCLUSIONS

Subjects

The subjects used in this experiment were ten male college students enrolled in Kansas State Teachers College, Pittsburg, Kansas, all of whom volunteered for the experiment. Three of the ten male subjects were known to have personality problems, and two of them had been under psychiatric care within the past four years. These three subjects were selected as part of the group; because it was felt that if there were any change in personality adjustment under the effects of benzedrine sulfate, these persons with definite personality problems would show the change to a greater extent. Each was required to have his blood pressure checked before starting the experiment, as benzedrine increases the heart action to quite an appreciable extent. Those with high blood pressures were not accepted for the experiment; however, this was the only criterion for the selection of the men. It was deemed advisable to limit the study to males, since the emotional state during menstruation might have to be considered if female subjects were included.

All subjects were asked not to deviate to any great extent from their normal living habits in order that the results obtained might be as representative as possible.

In addition, all subjects were asked not to consume any alcohol the night before testing, since this would be considered an abnormal situation if one were sick and feeling depressed generally from the after-effects of alcohol and loss of too much sleep. All these factors were checked verbally at each of the five testing sessions. Information given by the subjects was voluntary and answers to the questions were presumed to be true. None of the subjects varied more than one or two cigarettes or one or two cups of coffee on any day of examination.

Tests Employed

The Bell Adjustment Inventory and the Bernreuter Personality test were chosen for this experiment because each asks questions which are similar, thus lending themselves more readily to easy comparison. Both tests group their responses into categories and can easily be scored. Both tests can be given in approximately forty minutes; also each is a group test which is easily administered. It is recognized that these tests are limited in scope and are only general measures of personality adjustment, not to be compared with the results obtained from such tests as the Rorschach and Thematic Apperception tests.

A description of the two tests follows:

THE BELL ADJUSTMENT INVENTORY, ADULT FORM

This test is divided into five categories: Home Adjustment, Health Adjustment, Social Adjustment, Emotional Adjustment and Occupational Adjustment.

There is no time limit. Usually not more than twenty-five minutes are required for the test.

Home Adjustment. Individuals scoring high tend to be unsatisfactorily adjusted to their home surroundings. Low scores indicate satisfactory home adjustment.

Health Adjustment. High scores indicate unsatisfactory health adjustment; low scores, satisfactory adjustment.

Social Adjustment. Individuals scoring high tend to be submissive and retiring in their social contacts. Individuals scoring low are aggressive in their social contacts.

Emotional Adjustment. Individuals with high scores tend to be unstable emotionally. Persons with low scores tend to be emotionally stable.

Occupational Adjustment. Individuals with high scores tend to be dissatisfied with their present occupations. Those who make low scores tend to be well pleased with their present jobs.

The score of each category, Home, Health, Social, Emotional and Occupational Adjustment is obtained by use of

a key. When the stenciled numbers at the top and bottom of the key are superimposed upon the corresponding figures of the written test, vertical lines fall upon the possible scoring answers.[1]

THE BERNREUTER PERSONALITY INVENTORY

This test is divided into six parts. There is no time limit in taking the test, but it usually requires no longer than twenty-five minutes.

B1-N score is a measure of neurotic tendency. Persons scoring high tend to be emotionally unstable. Those scoring low tend to be well balanced emotionally.

B2-S is a measure of self-sufficiency. Persons scoring high on this scale prefer to be alone and tend to ignore the advice of others. Those scoring low dislike solitude and often seek advice from others.

B3-I is a measure of introversion-extroversion. Persons scoring high tend to be introverted. Those scoring low tend to be extroverted.

B4-D is a measure of dominance-submission. Persons scoring high tend to dominate others; those scoring low tend to be submissive.

F1-C is a measure of confidence in oneself. Persons scoring high on this scale tend to have feelings of inferiority; those scoring low tend to be well adjusted in their environment and to have a great deal of self-confidence.

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[1]Hugh M. Bell, "Manual for the Adjustment Inventory, Adult Form."

F2-S is a measure of sociability. Persons scoring high tend to be non-social, solitary or independent. Those scoring low tend to be sociable and gregarious.

The score of each category, B1-N, B2-S, B3-I, B4-D, F1-C, and F2-S, is obtained by use of a key which when placed on the answers gives a weighted value of either plus or minus quantity; and the difference in the plus and minus scores gives the scale score.[2]

Experimental Procedure

When the subjects reported for the test, the experiment was explained to them. They were told that they would be given either lactose or benzedrine at each testing period but that they would not know which they had received. This explanation was made because some of them had already obtained knowledge that benzedrine and lactose were going to be used in the experiment. There was also some doubt as to whether or not the subjects would participate if they had no knowledge beforehand of the capsules which they were to take orally. The subjects also were informed that they would be subjected to tests.

The first testing session on Monday morning, May 17, was devoted to the administration of the Bell Adjustment Inventory and the Bernreuter Personality test under normal

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[2]Robert G. Bernreuter, "Manual for the Personality Inventory."

conditions; i.e., without either lactose or benzedrine capsules. This was done in an effort to obtain a comparatively normal score for the two tests which could be used for comparison against the benzedrine and lactose situations.

The following Monday morning all subjects reported and this was the beginning of the administration of either the benzedrine or lactose capsules. The experiments employing the use of the capsules were conducted on successive Monday and Friday mornings for two consecutive weeks. The administration of the benzedrine capsules and lactose capsules was arranged so that five of the group received the benzedrine on Monday morning, while the other five received the lactose capsules. On the following Friday the five who had received the benzedrine on the preceding Monday were given lactose, and the five who had received the lactose on the preceding Monday morning were given the benzedrine. This procedure was followed for two consecutive weeks, thus there was a time lapse of a week between each dose of benzedrine and between each dose of lactose. It was thought that by spacing the tests on a Monday and Friday and having this time lapse of a week between each dose of benzedrine and each dose of lactose the interval would help control the memory and practice effect. Also it was hoped that having the same days of the week would help eliminate the change in mood which might occur from day to day.

When the subject reported for the experiment, he was required to rest completely for approximately fifteen minutes to allow the pulse rate to return to normal after the exertion of walking to the office. This pulse rate was taken and recorded. Then each subject was given one of two capsules which were exactly alike in appearance and which contained either ten miligrams of lactose (placebo) or ten miligrams of benzedrine. The ten miligram capsule of benzedrine and the ten miligram capsule of lactose were made to look exactly alike in order to eliminate the possible psychological effect of taking a drug. Thus it is not very probable that anyone of them was able to tell the difference between the benzedrine capsules and the lactose capsules.

This study was limited to dosages of ten miligrams of benzedrine sulfate, which was the maximum amount permitted by the college medical doctor. This fact is mentioned here because in other studies the amount of the dosage appears to be a decisive factor in its effect. Hecht and Sargent drew these conclusions:

> More attention should be given to individual differences. Some individuals cannot take benzedrine at all; why then is it not likely that with some subjects ten miligrams is an optimal dose, with others twenty miligrams and still others thirty miligrams?[3]

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[3]R. Hecht and S. S. Sargent, "Effects of Benzedrine Sulfate on Performance in Two Tests of Higher Mental Functions," Journal of Experimental Psychology, XXVIII (January-June, 1941), 532.

After a period of approximately two and one-half hours, during which the subject followed the usual routine of the day, he was again required to rest from ten to fifteen minutes, after which his pulse rate was again taken and recorded. At this time the Bernreuter Personality test and the Bell Adjustment Inventory were administered. After the completion of the tests, each subject was asked to describe his physical and mental feelings at this time. A check was also made of the number of cigarettes smoked during the preceding three-hour period and the amount of coffee consumed, since an unusual number of cigarettes or a greater quantity of coffee than normal might affect the blood pressure.

Results

In order to be certain that the two personality tests were given while the subject was still under the effects of benzedrine, the pulse rate was taken and recorded both before and after the administration of the drug. An increase in pulse rate was evident approximately two and one-half hours after ingestion of the benzedrine, which was the time the personality tests were taken, as shown in Table I.

TABLE I

PULSE RATE PER MINUTE

Subject	Before Benz.$_1$	$2\frac{1}{2}$ Hrs. After B_1	Before Benz.$_2$	$2\frac{1}{2}$ Hrs. After B_2
1	106	120	99	112
2	92	104	92	100
3	84	100	85	98
4	79	92	80	99
5	80	82	93	96
6	80	88	81	86
7	84	96	86	106
8	86	90	74	80
9	78	84	92	94
10	76	76	76	76

These findings tend to agree with the studies of Berdie,[4] Anderson,[5] and others, which show a rise in blood pressure under the effects of benzedrine sulfate.

The means of the benzedrine scores are compared with the means of the normal scores on the Bell Adjustment Inventory in Table II. The statistical formula for finding

[4]R. F. Berdie, "Effect of Benzedrine Sulphate on Blocking in Color Naming," Journal of Experimental Psychology, XXVII (July-December, 1940), 325.

[5]T. G. Anderson, "The Effect of Benzedrine Sulfate on Syllogistic Reasoning," Journal of Experimental Psychology, XXVI (January-June, 1940), 430.

"the significance of a difference in the means of independent small samples" was applied to the mean total adjustment scores, and the "t" test[6] showed that the difference found would occur by chance over 90 per cent of the time. These findings seem to indicate that ten miligrams of benzedrine sulfate do not change the subject's adjustment as measured by the Bell Adjustment Inventory.

TABLE II

COMPARISON OF MEANS ON THE SCORES OF THE BELL ADJUSTMENT INVENTORY AFTER INGESTION OF BENZEDRINE SULFATE AND DURING NORMAL SITUATION BY TEN STUDENTS, KANSAS STATE TEACHERS COLLEGE, PITTSBURG, KANSAS

Category	Benzedrine	Normal	Difference	"t" test
Home	4.15	3.8	.35	
Health	3.9	3.1	.8	
Social	7.5	7.6	- .1	
Emotional	4.75	4.5	.25	
Occupational	5.15	5.2	- .05	
TOTAL	25.45	24.2	1.25	90%

The benzedrine scores for the Bernreuter Personality test were then compared with the normal scores of the same test, as shown in Table III. Since there is such a high correlation of the last two categories of the Bernreuter

[6] E. F. Lindquist, Statistical Analysis in Educational Research, pp. 56-58.

with the remainder of the tests, it was felt that only the means of the last two categories would need be compared with the normal. On application of the "t" test[7] it was noted that these differences would appear 86 per cent of the time due to chance. Again it can be said that ten miligrams of benzedrine do not affect the scores on the Bernreuter Personality test.

TABLE III

COMPARISON OF MEANS ON THE SCORES OF THE BERNREUTER PERSONALITY TEST AFTER INGESTION OF BENZEDRINE SULFATE AND DURING NORMAL SITUATION BY TEN STUDENTS, KANSAS STATE TEACHERS COLLEGE, PITTSBURG, KANSAS

Category	Benzedrine	Normal	Difference	"t" test
B1-N	-104.45	-112.6	- 8.15	
B2-S	± 17.9	± 22.1	± 4.2	
B3-1	- 62.4	- 64.	- 1.6	
B4-D	± 72.7	± 80.2	± 7.5	
F1-C	- 69.6	- 82.5	-12.9	82%
F2-S	- 36.75	- 37.2	- .45	90%
TOTAL	-182.6	-194.	-11.4	

It has been shown that under the effects of benzedrine the scores do not change. This finding is further substantiated in a comparison of the mean scores for the Bell

[7] Ibid., pp. 56-58.

Adjustment Inventory, illustrated in Table IV, and the Bernreuter Personality test, shown in Table V, after taking lactose with the scores during a normal situation. The difference indicated by the "t" test[8] for the Bell Adjustment

TABLE IV

COMPARISON OF MEANS ON THE SCORES OF THE BELL ADJUSTMENT INVENTORY AFTER INGESTION OF LACTOSE AND DURING NORMAL SITUATION BY TEN STUDENTS, KANSAS STATE TEACHERS COLLEGE, PITTSBURG, KANSAS

Category	Lactose	Normal	Difference	"t" test
Home	3.95	3.8	.15	
Health	4.05	3.1	.95	
Social	8.	7.6	.4	
Emotional	6.1	4.5	1.6	
Occupational	5.85	5.2	.65	
TOTAL	27.95	24.2	3.75	71.4%

Inventory would occur 71.4 per cent of the time due to chance, while for the Bernreuter Personality the difference would occur 80 per cent of the time due to chance. Thus, when taking lactose instead of benzedrine, there is still no significant difference in scores using either of the two personality tests. It can, therefore, be said that the psychological effect of taking a capsule produces little change in results.

[8] Ibid., pp. 56-58.

TABLE V

COMPARISON OF MEANS ON THE SCORES OF THE BERNREUTER PERSONALITY TEST AFTER INGESTION OF LACTOSE AND DURING NORMAL SITUATION BY TEN STUDENTS, KANSAS STATE TEACHERS COLLEGE, PITTSBURG, KANSAS

Category	Lactose	Normal	Difference	"t" test
B1-N	-102.2	-112.6	-10.4	
B2-S	+ 17.5	+ 22.1	+ 4.6	
B3-1	- 60.	- 64.	- 4.	
B4-D	+ 73.4	+ 80.2	+ 6.8	
F1-C	- 65.4	- 82.5	-17.1	71%
F2-S	- 38.2	- 37.2	+ 1.	90%
TOTAL	-174.9	-194.	-19.1	

While it is apparent from the results just cited that neither benzedrine nor lactose caused any change in scores on the Bell Adjustment Inventory and Bernreuter Personality test, it was thought that a comparison of the benzedrine and lactose scores for these same two tests would be of interest. Table VI and Table VII set forth these comparisons.

By applying the statistical formula[9] it was found that on the Bell Adjustment Inventory this difference would occur 80 per cent of the time, and on the Bernreuter this difference would occur 90 per cent of the time due to chance and other variable factors.

[9] Ibid., pp. 56-58.

TABLE VI

COMPARISON OF MEANS ON THE SCORES OF THE
BELL ADJUSTMENT INVENTORY
AFTER INGESTION OF LACTOSE OR BENZEDRINE SULFATE
BY TEN STUDENTS, KANSAS STATE TEACHERS COLLEGE,
PITTSBURG, KANSAS

Category	Benzedrine	Lactose	Difference	"t" test
Home	4.15	3.95	+ .2	
Health	3.9	4.05	-..15	
Social	7.5	8.	- .5	
Emotional	4.75	6.1	-1.35	
Occupational	5.15	5.85	- .7	
TOTAL	25.45	27.95	-2.5	80%

TABLE VII

COMPARISON OF MEANS ON THE SCORES OF THE
BERNREUTER PERSONALITY TEST
AFTER INGESTION OF LACTOSE OR BENZEDRINE SULFATE
BY TEN STUDENTS, KANSAS STATE TEACHERS COLLEGE,
PITTSBURG, KANSAS

Category	Benzedrine	Lactose	Difference	"t" test
B1-N	-104.45	-102.2	-2.25	
B2-S	+ 17.9	+ 17.5	+ .4	
B3-1	- 62.4	- 60.	-2.4	
B4-D	+ 72.7	+ 73.4	- .7	
F1-C	- 69.6	- 65.4	-4.2	90%
F2-S	- 36.75	- 38.2	+1.45	90%
TOTAL	-182.6	-174.9	-7.7	

Conclusions

As a result of this study the writer has drawn the following conclusions:

1. Generally, ten miligrams of benzedrine sulfate taken orally produces a substantial increase in the pulse rate.

2. The slight differences in scores found in the comparison of the normal scores, benzedrine scores, and the lactose scores on the Bell Adjustment Inventory and the Bernreuter Personality test can be accounted for in terms of chance and other variable factors rather than the effects of the ten miligrams of benzedrine sulfate.

3. Dosages of ten miligrams of benzedrine sulfate are not likely to distort the true picture of personality adjustment as measured by the Bernreuter Personality test and the Bell Adjustment Inventory; however, there may be superficial changes in the personality.

4. Since ten miligrams of benzedrine sulfate do not distort the true picture of personality adjustment as measured by the Bernreuter Personality test and the Bell Adjustment Inventory, and since the related studies indicate that the drug induces an exhilaration of mood, increase in confidence and talkativeness, its use in the counseling situation can save much time and effort by making the subject more accessible to investigation.

CHAPTER III

SUMMARY AND RECOMMENDATIONS

Summary

The purpose of this study is to determine the effects of benzedrine sulfate on personality adjustment, as measured by two personality tests.

The personality tests used in this experiment were the Bell Adjustment Inventory and the Bernreuter Personality test. Each of these tests was given five times to ten male students of Kansas State Teachers College, Pittsburg, Kansas. Three of these students were known to have definite personality problems.

All subjects took the two personality tests on Monday, May 17, 1948 under normal conditions. The group was then divided into two groups of five each. For the following Monday's experiment the first group of five was given benzedrine, while the second group of five was given lactose. On the following Friday the second group was given the benzedrine while the first (or Monday) group received the lactose. This procedure remained the same for the following week. The benzedrine and lactose were administered orally and consisted of ten miligram capsules made to look exactly alike, so that none of the subjects knew when he had received benzedrine or lactose.

The scores on the tests mentioned above were compared, and the differences were tested statistically by applying the "t" test for finding the "significance of a difference in the means of independent small samples."[1]

The difference between the means found in comparing the scores on the Bell Adjustment Inventory while under the influence of benzedrine with those during a normal situation would occur 90 per cent of the time; while under the same conditions with the Bernreuter Personality test, the difference would occur 86 per cent of the time due to chance or other variable factors.

In comparison of the mean scores after ingestion of lactose with the mean scores of the normal situation, the Bell Adjustment Inventory showed that the difference in the scores would occur 71.4 per cent of the time due to chance; while these two differences on the Bernreuter were found to occur 80 per cent of the time due to chance and other variable factors.

The means of these same two personality tests were again compared with scores made while under the influence of benzedrine and after taking lactose. On the Bell Adjustment the difference was found likely to occur 80 per cent of the time, while the difference of the means on the Bernreuter Personality test was found to occur over 90 per cent of the time due to the same factors of chance.

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[1] Ibid., pp. 56-58.

As a result of this study the following conclusions may be drawn:

1. Generally, there is a substantial increase in the pulse rate brought about by the ingestion of ten miligrams of benzedrine sulfate.

2. The slight difference in the normal scores and benzedrine scores was due to chance.

3. Dosages of ten miligrams of benzedrine sulfate are not likely to distort the true picture of personality adjustment; however, its effect may cause a superficial change in the personality adjustment.

4. Presuming that benzedrine sulfate induces an exhilaration of mood, increase in confidence and talkativeness, as indicated in the related studies, this investigator feels that dosages of ten miligrams of benzedrine sulfate can probably be used in the counseling situation to make the subject more accessible to investigation, thus saving much time and effort.

Recommendations

It is recommended that further research be conducted investigating the effects of benzedrine sulfate on personality adjustments with the following suggestions in mind:

1. Each subject taking the benzedrine should be checked regularly by competent medical examiners to determine at what time, after taking benzedrine, the effect of

the drug reaches its climax and how long the climax continues for each individual. This information should be known before the experiment is started, and any testing should coincide with the time when the effect of benzedrine is at its peak.

2. Personality tests such as the Minnesota Multiphasic, Thematic Apperception Test, or the Rorschach may be used to give a more exact picture of personality adjustment.

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APPENDIX

INDIVIDUAL TEST RESULTS ON BELL ADJUSTMENT INVENTORY

Subject	Condition	Home	Health	Social	Emotional	Occupational
1.	Normal	9	3	13	5	14
	1st Lactose	9	4	11	6	15
	2nd Lactose	10	4	11	5	15
	1st Benz.	13	7	11	5	11
	2nd Benz.	8	4	10	4	14
2.	Normal	12	6	24	15	8
	1st Lactose	11	6	28	21	7
	2nd Lactose	11	7	28	17	10
	1st Benz.	12	7	25	16	10
	2nd Benz.	12	6	24	16	8
3.	Normal	3	9	18	15	4
	1st Lactose	1	10	19	13	6
	2nd Lactose	2	11	17	14	4
	1st Benz.	4	9	20	10	4
	2nd Benz.	2	7	18	13	4
4.	Normal	3	3	9	7	3
	1st Lactose	5	4	7	10	5
	2nd Lactose	3	8	6	21	4
	1st Benz.	7	6	7	5	2
	2nd Benz.	3	4	6	15	2
5.	Normal	8	1	4	0	1
	1st Lactose	4	1	4	5	8
	2nd Lactose	8	1	4	3	4
	1st Benz.	6	2	4	1	2
	2nd Benz.	7	1	4	2	2
6.	Normal	1	3	3	0	1
	1st Lactose	1	2	5	0	0
	2nd Lactose	1	2	7	0	0
	1st Benz.	2	2	8	0	1
	2nd Benz.	1	2	3	0	1
7.	Normal	1	0	0	0	0
	1st Lactose	2	0	0	0	1
	2nd Lactose	2	0	0	0	2
	1st Benz.	1	0	1	0	4
	2nd Benz.	2	0	1	1	3
8.	Normal	0	1	0	2	1
	1st Lactose	0	7	1	2	2
	2nd Lactose	0	1	0	2	1
	1st Benz.	0	6	1	1	0
	2nd Benz.	0	1	0	3	1
9.	Normal	0	3	1	0	0
	1st Lactose	2	3	1	0	2
	2nd Lactose	0	3	1	0	0
	1st Benz.	0	4	1	0	0
	2nd Benz.	0	5	1	0	0
10.	Normal	1	2	4	1	20
	1st Lactose	6	4	5	2	13
	2nd Lactose	1	3	5	1	18
	1st Benz.	2	3	4	2	18
	2nd Benz.	1	2	3	1	16

INDIVIDUAL TEST RESULTS ON BERNREUTER PERSONALITY TEST

Subject	Condition	B1-N	B2-S	B3-I	B4-D	F1-C	F2-S
1.	Normal	- 56	- 5	- 39	+ 52	- 35	- 11
	1st Lactose	- 78	- 3	- 50	+ 71	- 52	- 7
	2nd Lactose	- 85	- 8	- 56	+ 63	- 52	- 18
	1st Benz.	- 77	- 17	- 53	+ 67	- 59	- 38
	2nd Benz.	- 75	- 18	- 35	+ 60	- 51	- 47
2.	Normal	+ 7	+147	+ 28	+ 40	- 9	+181
	1st Lactose	+ 96	+123	+ 75	- 9	+ 83	+199
	2nd Lactose	+ 77	+111	+ 60	- 12	+ 76	+167
	1st Benz.	+ 47	+147	+ 40	+ 26	+ 30	+202
	2nd Benz.	+ 99	+129	+ 53	+ 4	+ 55	+171
3.	Normal	+ 44	- 38	0	- 80	+ 85	- 14
	1st Lactose	+ 57	- 43	+ 9	- 77	+108	- 20
	2nd Lactose	- 7	- 26	- 20	- 49	+ 57	- 36
	1st Benz.	+ 48	- 70	+ 10	- 79	+115	- 45
	2nd Benz.	- 7	- 46	- 24	- 56	+ 58	- 37
4.	Normal	- 66	- 24	- 43	+ 45	- 33	- 65
	1st Lactose	- 93	- 17	- 51	+ 28	- 19	-104
	2nd Lactose	+ 74	-100	+ 49	- 58	+155	- 81
	1st Benz.	- 49	- 12	- 29	- 35	+ 23	- 78
	2nd Benz.	+ 43	- 70	+ 27	- 68	+122	- 40
5.	Normal	-145	+ 40	- 70	+142	-109	- 22
	1st Lactose	-133	+ 56	- 68	+156	-117	0
	2nd Lactose	-148	+ 29	- 73	+157	-126	- 38
	1st Benz.	-166	+ 54	- 90	+156	-135	- 22
	2nd Benz.	-152	+ 46	- 77	+158	-115	- 10
6.	Normal	-133	+ 1	- 75	- 30	- 40	-184
	1st Lactose	-122	+ 8	- 81	- 21	- 27	-164
	2nd Lactose	-129	+ 17	- 74	- 32	- 31	-168
	1st Benz.	-100	+ 20	- 64	- 28	- 29	-132
	2nd Benz.	-133	+ 12	- 68	- 26	- 28	-168
7.	Normal	-207	+ 61	-113	+197	-217	- 30
	1st Lactose	-218	+ 63	-120	+209	-221	- 27
	2nd Lactose	-207	+ 83	-117	+199	-207	- 1
	1st Benz.	-219	+ 30	-131	+201	-208	- 52
	2nd Benz.	-222	+ 70	-119	+211	-220	- 14
8.	Normal	-185	- 2	-100	+146	-126	- 97
	1st Lactose	-186	- 2	-119	+148	-148	-104
	2nd Lactose	-175	- 16	-101	+138	-124	- 85
	1st Benz.	-184	- 9	-110	+145	-140	-107
	2nd Benz.	-179	- 7	-114	+135	-135	- 93
9.	Normal	-199	+ 59	-107	+167	-185	- 30
	1st Lactose	-201	+ 49	-121	+159	-183	- 52
	2nd Lactose	-209	+ 46	-108	+167	-188	- 41
	1st Benz.	-207	+ 52	-120	+169	-188	- 40
	2nd Benz.	-191	+ 38	-104	+159	-166	- 40
10.	Normal	-186	- 18	-121	+123	-156	-100
	1st Lactose	-183	- 6	-117	+111	-136	- 94
	2nd Lactose	-173	- 14	-117	+120	-156	- 90
	1st Benz.	-173	+ 14	-114	+129	-154	- 55
	2nd Benz.	-192	- 5	-126	+126	-167	- 90