DRUGS AND PERSONALITY

X. THE EFFECTS OF STIMULANT AND DEPRESSANT DRUGS UPON KINAESTHETIC FIGURAL AFTER-EFFECTS*

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1. Introduction

In the previous paper we have given a brief discussion of the reasons why figural after-effects are of interest in the study of personality and why stimulant and depressant drugs would be expected to have certain effects upon them (Eysenck and Easterbrook, 1960a). In this paper we describe an experiment using kinaesthetic figural after-effects rather than visual ones. By and large results with kinaesthetic figural after-effects have been more clear-cut and definite in relating these after-effects to personality; several studies have shown extraverts to have greater figural after-effects than introverts (Eysenck, 1957). Furthermore there is at least one study demonstrating that stimulant and depressant drugs have the predicted results upon kinaesthetic figural after-effects (Poser, 1958). The reasons for this may be that whereas for visual experiments it is difficult to check on the subject's ability to maintain fixation, nothing comparable is required in experiments on kinaesthetic figural after-effects. Furthermore any departure from instruction on the part of the subject can easily be checked by the experimenter. For these reasons kinaesthetic tests have very definite advantages over visual ones.

2. The Experiment

Details of drugs, experimental design and subjects have been given in a previous paper (Eysenck and Easterbrook, 1960b). Eight subjects in all were tested under four drug conditions (d-amphetamine sulphate, sodium amylobarbitone, meprobamate, and a placebo), in an experimental design which ensured that each drug would be given once after each other drug and in each serial position. The experimental design, a balanced incomplete block, was completed twice, once for the subjects seen in the morning and once for those seen in the afternoon. The test under discussion here was only one of several applied to the same group of subjects under the same conditions.

The apparatus for this test of kinaesthetic figural after-effect has been previously described (Eysenck, 1957). It consists of a graduated wedge along which the subject must find a width corresponding to the width of a standard

* We are indebted to the Wallace Laboratories for the support of the investigation.

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https://doi.org/10.1192/bjp.106.444.852 Published online by Cambridge University Press

block presented to his alternate hand. A stimulus block, narrower than the standard, is to be stroked to provoke "satiation". Four sets of control and post-satiation readings were taken, one in each of the four different orientations of the wedge, NE, SW, E and W in a constant order. Each set of readings consisted of four control measures and four experimental measures, the point of subjective equality being approached alternately from either end of the wedge in each case. The experimental measures were taken immediately after the subject had rubbed the stimulus block for thirty seconds with the hand he used to feel the width of the standard block. The subject was blind-folded throughout. The readings were points on an arbitrary scale attached to the wedge. The subjects were allowed to take their own time for each judgment, but the post-stimulation matchings were usually completed within a minute after the rubbing had been completed, the first of them being recorded within 10–15 seconds of that time.

3. Results

The predicted effect of 30 seconds rubbing a smaller block in place of the standard was a displacement of the cerebral projection of the contours of the standard so as to make it seem relatively larger. This would be reflected in a larger setting of the variable stimulus. The results, both for the whole of the data and for the matrix composed only of the first post-stimulation readings, indicated greatest "satiation" under amytal treatment, least with the placebo or amphetamine. These results agree with prediction, but fail to reach acceptable levels of statistical significance.

The kinaesthetic matching test results are displayed in Table I. The means of the first post-stimulation readings and of all control readings indicate greatest error under amytal treatment amd least error under placebo in both cases. In the lower half of the table are shown errors in control settings and error change scores, both expressed as percentages of the total across treatments. This form makes these results directly comparable with those previously reported for visual tests (Eysenck and Easterbrook, 1960a). In fact the agreement between the two sets of data is quite close.

Table I

Kinaesthetic Matching Test Results

	Treatments			
	Placebo	Amphetamine	Amytal	Meprobamate
	Units Excess of V over S			
Differences E–C:				
All data	0·03	−0·19	0·51	0·34
1st readings only	−0·63	−0·05	1·11	−0·21
Mean Scores:				
Control—all data	3·10	3·37	5·56	4·77
Experimental (1st)	2·47	3·32	6·67	4·56
	Ratios of Treatment Means to Total Across Treatments			
Control errors	18·4	20·1	33·1	28·4
Error change (E/C×100) ..	20·7	24·7	30·5	24·1

https://doi.org/10.1192/bjp.106.444.852 Published online by Cambridge University Press

The differences between experimental and control measures in Table I correlate with both the control errors in the kinaesthetic test and with the calculations of experimental error per unit control error in the visual matching tests. These facts suggest that the indications of differential satiation in the kinaesthetic test and in the visual size matching test might possibly be regarded as reflecting consistent differences in capacity for correction of error. Indeed when the percentage scores from Table I are put into a matrix with the error change scores from Table IV of the preceding paper, the effect of treatments remains substantially unchanged and highly significant ($F=31 \cdot 1$ with 3/12 d.f.). The mean percentages are: placebo, 18·3; amphetamine, 21·8; amytal, 33·6; and meprobamate, 26·3. The standard error of the difference between any two of these means is 1·66, so that only the differences between amphetamine and either the placebo or meprobamate treatments fail to reach significance. No such consistent result is found if the matrix be arranged so that high scores indicate satiation in the expected form. Of course the condition which prevents improvement in accuracy of matching may in fact be neural satiation.

4. Discussion

The results of this experiment agree with prediction in showing that figural after-effects are greatest with amylobarbitone, least with amphetamine (all data) or placebo (first readings only). The results, therefore, agree with those of Poser but their failure to reach statistical significance makes it impossible to regard the prediction as finally proven.

It is again found that errors show drug effects more clearly than do calculations relating to figural after-effects. Results are very much in line with those in the paper on visual figural after-effects.

5. Summary

The effects were tested of stimulant and depressant drugs on kinaesthetic figural after-effects. The hypothesis that stimulant drugs would decrease after-effects, while depressant drugs would increase them, was supported by the results, but only at a low level of statistical significance. It was found that liability to error in making settings under control conditions was affected much more strongly than were figural after-effects, and the results were very similar to those obtained previously with visual figural after-effects.

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https://doi.org/10.1192/bjp.106.444.852 Published online by Cambridge University Press