Pupil responses of addicts in treatment to drug culture argot: II. Responses during verbalization of visually presented words

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A series of words falling into the categories of control, sex, and drug argot were visually presented to 10 addicts in treatment. The latter two categories were composed of double entendre words, one of the meanings of which referred to sex or drug argot. Ss were asked to verbalize each word as it was presented. Mean pupil responses did not differentiate the stimulus categories; however, psychometric scales relating to addiction and sexual orientation correlated significantly with pupil responses to the appropriate stimulus categories.

In a previous report (Altman, Bernick, & Mintz, 1972), it was found that postaddicts were not discriminable as such on the basis of their pupil responses to aurally presented double entendre words, one of the meanings of which classified these words as drug culture argot. While postaddicts did respond differentially to argot and nonargot words, nonaddict staff members familiar with argot showed the same differential response. This unexpected difference in pupil size for argot vs nonargot words was explained in terms of the requirement of "thinking" about the words presented and the possible difference in difficulty of thinking about words with and without strong immediate referents. If valid, this explanation suggests that cognitive function, not emotional or arousal function, was being observed under these experimental conditions. In an effort to observe the emotional involvement with language that has been hypothesized, a number of major changes were made in the experimental design. In order to maximize the impact of the argot, a new set of words was selected which, though still double entendre, were more obviously drug related. An additional category of double entendre stimulus words relating to sex were included in the test battery for comparison with the argot words. In order to insure that Ss attend to the stimuli, understand them, and experience them throughout the test intervals, stimuli were presented visually and Ss were asked to read the words that were projected. These ploys were all designed to improve the chances of eliciting and measuring emotional responses to the stimuli.

The modality of stimulus presentation was changed, since some degree of success has been reported with visual presentation of words (e.g., Guinan, 1966; Polt & Hess, 1968; Paivio & Simpson, 1966). The requirement of verbalization was added since it has been shown to produce marked dilation of the pupil (Hakerum & Sutton, 1966; Bernick & Oberlander, 1968; Simpson & Paivio, 1966)—this being hypothesized to be due to the stress or emotional loading of the verbalization requirement. The latency to respond verbally was also recorded as a measure analogous to recognition threshold, and as a possible correlate of the content of the stimuli.

SUBJECTS

The Ss were 10 postaddicts in treatment at the NIMH Clinical Research Center in Lexington, Kentucky. The age range was 19 to 46 years, with a mean of 28 years; 5 were black and 5 were white. Psychometric data routinely gathered for treatment purposes were available from the records of all of these Ss.

INSTRUMENTATION

Pupil size was recorded at a rate of 2 observations/sec. The instrumentation has been described elsewhere (Altman, Bernick, & Mintz, 1972; Bernick & Oberlander, 1968). Unlike the previous study (Altman et al, 1972), testing was not preceded by alternate light and dark periods since all Ss appeared to have normal pupillary responses upon preexperimental examination. Light conditions were kept constant at approximately 15 fc throughout the experiment.

PROCEDURE

The Ss were placed at the apparatus, the camera was focused, and, with a

control slide (a gray field with an "X" in the center) on the screen, the following instructions were read: "Watch the screen in front of you. When a word appears on the screen, say the word aloud and concentrate on that word as long as it stays on the screen. When there is no word, just look at the 'X' in the middle of the screen. Let's try these samples."

At this point E advanced the projector to the first of two sample words and observed S's response. If S repeated the word as instructed, the next control slide and sample word were presented and a 3-min adaptation period was started. If S failed to respond properly, the instructions were repeated until the appropriate response was made, after which the adaptation period was started. The stimuli were 30 three- to six-letter words, 10 each in the primary meaning categories of control, drug, and sex. These words were ordered randomly but corrected for split-half frequency, i.e., each of the stimulus categories was equally represented in each half of the series.¹ Each stimulus word slide was preceded by a control slide and all slides were presented for 5 sec each.

MATERIALS

Stimuli consisted of typewritten words that had been photographed in the form of slides and projected on the rear-projection screen of the pupil apparatus. The height of the projected word images was 3 cm, subtending a visual angle of approximately 2.8 deg.

RESULTS

Pupil size did not differentiate the three stimulus conditions. That is, average pupil sizes during control words, sex words, and drug words were not significantly different. While Ss took slightly longer, on the average, to respond to drug words ($t = 2.29$, $df = 9$, $p < .025$) as compared to control words, there were no significant differences in latency to respond between drug and sex words or sex and control words.

Pupil responses to drug and sex words relative to control words were correlated with Ss' scores on four psychometric scales that were hypothesized to be related to the content of these stimuli. Three of these scales (VE, AP, MF) were from the Lexington Personality Inventory (LPI), an MMPI type of personality inventory developed at the Clinical Research Center (Monroe, Miller, & Lyle, 1963) and routinely administered to its residents. The fourth (LA) was one of a group of special research scales also routinely administered at the Center. Relative pupil responses to sex and drug words were not significantly related to "vocabulary estimate" (VE), a verbal intelligence scale. While pupil

responses to drug words were correlated to scores on the "language of addiction" (LA) scale ($r = .71$, $p < .025$), no relationship was seen between this scale and the responses to sex words. Pupil responses to drug words were also correlated to scores on the "acceptability for psychotherapy" (AP) scale ($r = -.62$, $p < .05$). That is, Ss who were more responsive to the drug words scored lower on the AP scale. No correlation was found between responses to the sex words and the AP scale. While pupil responses to the drug words were not correlated to scores on the "masculinity-femininity" (MF) scale, responses to the sex words were so correlated ($r = -.61$, $p < .05$). That is, Ss showing greater response to the sex words scored more toward the masculine end of the MF scale.

Correlations between latency-to-respond scores for sex and drug words relative to control words and the aforementioned psychometric scales, revealed no significant relationships.

DISCUSSION

The results offer some support for the hypothesis that pupil responses to words reflect a S's attitude toward the general content of those words. The positive correlation between pupil responses to drug words and the scale called language of addiction is, in spite of the rather misleading name of the scale, predictable in terms of arousal. The LA scale is composed of items that were specifically chosen to assess favorable attitudes toward drugs and has been shown to discriminate between alcoholics and opiate addicts (Haertzen, Monroe, Hooks, & Hill, 1970; Monroe, English, & Haertzen, 1971). While it has little content directly related to addict argot, it does reflect the commitment and specificity of an individual's abuse of opiates. In that the argot employed in the present study is all specifically related to opiates, it is reasonable to expect that persons scoring higher on the LA scale would be more responsive to these

words. Similarly, the AP scale was specifically intended to aid in the selection of those addicts who are least committed to the life of the addict—the hypothesized "most treatable" addicts (Berzins, Ross, & Monroe, 1970). The significant negative correlation of pupil responses to drug words with the AP scale suggests that an individual's responsiveness to drug argot reflects his commitment to "the life" and hence his "treatability."

The absence of significant differences between the group mean pupil responses may be best explained in terms of S variables. Although all Ss were clearly labeled as "addicts" by their being admitted to the Clinical Research Center for treatment, they exhibited a wide range of involvement with the "addict subculture" and represented a variety of backgrounds. Because of this heterogeneity, the assumption that all addicts would show increased pupil size to drug words may be unwarranted. A more conservative course would assume that, within our sample, addicts' positions with regard to a commitment to addiction would vary from no commitment to complete commitment and that with increasing commitment to addiction, drug argot would have more impact or arousal value.² With the sample size of the present study, such a hypothesis can be tested only by using correlational analyses. We have shown that correlations do exist between the scales LA and AP and pupil responses to argot and that there is a range of level of commitment to addiction as measured by these two scales.

While, at present, this technique requires further validation, it does offer the prospect of ordering an individual's interests by means of an autonomic indicator free from voluntary distortions and fabrications. In order to develop a more discriminating technique, we will attempt to select more homogeneous groups and increase the variety of

stimuli available.

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NOTES

1. A list of these words is available upon request.
2. If the same reasoning is applied to the previous study in this series (Altman, Bernick, & Mintz, 1972) we would not expect to find correlations with scales reflecting commitment to addiction, such as LA and AP since those Ss were presumably responding to the cognitive loading rather than to the emotional or arousal content of the stimuli. This analysis was performed and, as expected, no significant relationships were evidenced.