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RESOLUTION OF BINOCULAR RIVALRY AS A MEANS OF IDENTIFYING VIOLENCE-PRONE OFFENDERS*

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Traditionally, responses in psychological testing situations have been regarded as reflecting traits, needs, or other dispositional characteristics. This general thesis has guided a number of experiments in which the disposition to violence was inferred from the subject's performance on a perceptual task. The present study attempts to replicate some of these investigations in which the dependent variable was the subject's resolution of binocular rivalry.

The authors' major hypothesis was that a sample of violent offenders would perceive and report more "violence" resolutions in a binocular rivalry situation than a sample of non-violent offenders. The hypothesis was not confirmed. This lack of convergence between expectations and findings led them to an analysis of the experimental situation. This analysis suggested that "cue" properties of the testing situation influenced the verbal reporting. It appeared that the violent subject's suspicion of the experimenter's hypothesis decreased the validity of his verbal responses.

The results of this experiment underscored the caution discussed by Kroger,[†] Sarbin,[‡] and others, to wit: the subject's verbal report of his "percept" upon which the diagnostician infers violence proneness (or other dispositional characteristics) may or may not be faithful to what is perceived. Suggestions for future research were offered to obtain increased validity in the reporting of binocular resolutions.

The thesis that need dispositions and personality traits influence what one sees and hears has been widely exploited. The typical experiment presents ambiguous or confusing stimuli where the informational input is inadequate to call out a well-formed response. The subject nevertheless "sees" or "hears" a formed stimulus—going beyond the information given. The form of the response, it has been demonstrated, is determined

for the most part by prevailing personality dispositions, e.g., authoritarianism, by needs, e.g., hunger, by habitual modes of response, e.g., aggression, and by cognitive style, e.g., intellectualization.

In the context of this general thesis, Engel¹ introduced the stereoscope as means of studying resolutions of binocular rivalry. It is a method for presenting visual stimuli, the response to which depends upon factors other than the cues provided by the stimulus displays. Originally investigated by Panum,² Engel carried out a series of studies to take the resolution of binocular rivalry out of the

* This study was supported in part by Public Health Service Grant MH08565, from the National Institute of Mental Health.

† Kroger, *The Effects of Role-Demands and Test-Cue Properties upon Personality Test Performance*, 31 J. CONSULTING PSYCHOLOGY 304 (1968).

‡ Sarbin, *Role Theoretical Analysis of Psychological Change*, in WORCHEL & BYRNE (eds.), *PERSONALITY CHANGE* (1964).

¹ Engel, *The Role of Content in Binocular Resolution*, 69 AM. J. PSYCHOLOGY 87 (1956).

² PANUM, *PHYSIOLOGISCHE UNTERSUCHUNGEN UEBER DAS SEHEN MIT ZWEI AUGEN*, DUBOIS REYMOND'S ARCHIV. 63 (1867).

realm of curious and trivial perceptual phenomena. He made clear that individual biases were operative in the resolution of the binocular situation.

Dominance in binocular rivalry can occur for the same reasons monocular dominance occurs: namely, if two targets exposed monocularly to the corresponding areas of the two retinas (thus creating an overlap in the binocular field of vision) are dissimilar in brightness, saturation, color contrast to background, clearness, etc., the one target possessing more of these qualities is dominant over the other.³ Thus, contributing to dominance is the qualitative and quantitative differences between the two monocular patterns. If, however, the two monocular targets are held as constant as possible in regard to disparities in intensity, hue, etc., the product of the binocular resolutions appears to be related to particular dispositional characteristics of the subject.

These internal conditions seem to be consequences of previous experiences, residuals of biases, or personal preferences. Engel has shown that these dispositional characteristics affect binocular resolution in much the same manner as differences in physical stimulus value. He used the photograph of a face as a monocular target to one eye and the identical face upside-down to the other eye. Most people reported seeing predominantly the right-side-up face. In line with prior experience and greater familiarity with the right-side-up, stimulus dominance was established. Familiarity with stimulus content as a subjective condition appears to enhance location and interpretation of visual displays. Engel's observations stimulated a diversity of experiments using the stereoscopic technique. When Mexican scenes were presented to one eye and similar American scenes to the other, Mexican subjects reported predominantly Mexican scenes, while Americans perceived predominantly American scenes, presumably because of greater familiarity.⁴ South Africans exposed to various combinations of White, Indian, and Negro persons showed that the prejudiced observer had a strong tendency to report "unintegrated" scenes while the unprejudiced observers resolved the effects of rivalry in the direction of more "integrated" concepts, reporting predominantly ethnic

mixture more in keeping with their particular racial attitudes.⁵

Toch and Schulte⁶ were the first to apply the stereoscopic technique experimentally to problems in the field of criminology. These authors paired violent or criminal scenes with neutral pictures in the stereoscope. The reports of persons in advanced training in law enforcement were predominantly "violent", while a matched group of beginning students in law enforcement and a group of liberal arts students reported predominantly the relatively innocuous, "neutral" pictures. Shelley and Toch⁷ concluded from a study on institutionalized offenders that the readiness to perceive violence in binocular rivalry situations is related to a consistent tendency to accept violence as a suitable course of action in interpersonal transactions. Subjects reporting predominantly violent percepts were regarded as having a tendency to express actively hostility and violence.

In a further development, Berg and Toch⁸ constructed pictures featuring styles of need satisfaction. Each pair comprised one picture featuring a relatively crude, uncultured expression of impulse and the other a more socialized, refined expression. Subjects tested were classified as either under-controlled (impulsive) or over-controlled (neurotic) according to test scores on the Minnesota Multiphasic Personality Inventory. The findings on the stereoscope supported the assumption that this method appears to have considerable diagnostic validity. Subjects giving "impulsive" reports most of the time were originally identified by their MMPI scores as impulsive and under-controlled, while their counterparts scored high on the neurotic triad of the MMPI.

Finally, Moore⁹ explored the differential effects of sex role and age on the perception of violence and found that males perceived significantly more

⁵ Pettigrew, Allport, & Barnett, *Binocular Resolution and Perception of Race in South Africa*, 49 *BRIT. J. PSYCHOLOGY* 265 (1958).

⁶ Toch & Schulte, *Readiness to Perceive Violence as a Result of Police Training*, 52 *BRIT. J. PSYCHOLOGY* 389 (1961).

⁷ Shelley & Toch, *The Perception of Violence as an Indicator of Adjustment in Institutionalized Offenders*, 53 *J. CRIM. L.C. & P.S.* 463 (1962).

⁸ Berg & Toch, *"Impulsive" and "Neurotic" Inmates: A Study in Personality and Perception*, 55 *J. CRIM. L.C. & P.S.* 230 (1964).

⁹ Moore, *Aggression Themes in a Binocular Rivalry Situation*, 3 *J. PERSON. & SOCIAL PSYCHOLOGY* 685 (1966).

³ Engel, *supra* note 1.

⁴ Bagby, *A Cross-Cultural Study of Perceptual Pre-dominance in Binocular Rivalry*, 54 *J. ABNORMAL & SOCIAL PSYCHOLOGY* 33 (1959).

violence and that violence perception increases linearly with age.

With this background, we designed an experiment to determine whether the stereoscope could be used to identify offenders who were prone to violence. Needless to say, an instrument that would enable the segregation of assault-prone offenders for custody or treatment would have great value to administrators of correctional programs. Our strategy was to establish two relatively pure criterion samples: (1) "violent" offenders and (2) offenders with no history of violent conduct.

METHODS AND PROCEDURES

The Reception-Guidance Center at the Deuel Vocational Institution (Tracy, California) admits approximately fifty youthful offenders each week committed by the Courts for a program of rehabilitation. The population is composed of older wards whose mean age is 19.4. During a period of four weeks, each ward is tested, interviewed and evaluated for his particular psychological, social, academic, vocational and custodial assets and shortcomings. The present study was conducted in this context.

APPARATUS

The apparatus used for the present study was a stereoscope similar to the one designed by Engel.¹⁰ The total apparatus is completely enclosed in a light-proof box. Two entirely different targets, one presented to the left eye and one to the right eye, were illuminated simultaneously for a period of 0.5 seconds by a 7½ watt bulb. The perceptual reports given by the observers were recorded and analyzed.

SUBJECTS

The subjects for the present study were selected from the total consecutive intake at the Center during a three month period in early summer of 1966. All subjects presently committed for a "violent" offense were regarded as candidates for inclusion in the study. For each assaultive subject, we selected a counterpart as a candidate for inclusion in the study, taking the next arriving subject of the same ethnic background and similar academic functioning level but committed for a

"non-violent" offense. In this manner, we prepared a weekly list of subjects.

In order to prevent biases in test administration and scoring, these lists revealed no information except the name and number of each subject. All of the subjects were tested individually with the stereoscope using Toch's¹¹ original "violent" and "neutral" stimuli and Berg's¹² original "socialized" and "impulsive" stimuli.

At this point the total group was divided into "violent" and "non-violent" groups using present offense as the only criterion. This procedure yielded two rough preliminary samples of 72 "violent" and 85 "non-violent" subjects.¹³ To be included in the final analysis subjects had to meet two additional criteria. First, they had to demonstrate a non-defensive and cooperative test-taking attitude so that their responses on the stereoscopic test could be assumed to be valid; and second, they had to fall clearly into the non-violent, non-aggressive sample, or the violent, aggressive sample as reflected in the total known life history of the individual. More specifically the selection of subjects to be included in the final data analysis took the following course:

1. During initial administration of the stereo tests, we discovered that many inmates appeared to be "denying" the violent pictures, that is, consistently reporting only non-violent responses. Therefore a validity check was introduced consisting of the same violent picture presented to both eyes simultaneously. If the subject still gave a "fake-good" non-violent response, (e.g., "shaking hands" instead of "stabbing"), he was dropped from the study.

2. The files of each of the remaining subjects were carefully scrutinized to insure proper classification as "violent" or "non-violent." A subject was included in the "violent" group only if his committing offense was clearly violent, and furthermore only if it was clear that he actually took part in the act of violence and was not simply a by-stander. A subject was included in the "non-violent" group only if his present offense and his known life history were free from threat of or actual physical assault on another person. In addition,

¹¹ Toch & Schulte, *supra* note 6.

¹² Berg & Toch, *supra* note 8.

¹³ The unequal numbers of the groups resulted from some subjects' failure to take all the psychometric tests.

¹⁰ Engel, *supra* note 1.

TABLE I
DESCRIPTIVE STATISTICS FOR THE TWO SAMPLES IN THE VARIABLES INDICATED

	Violent Group		Non-Violent Group		Difference	t
	M	SD	M	SD		
<i>Toch Stimuli</i>						
Violent Percepts.....	4.60	2.19	4.05	2.04	0.55	0.82
Neutral Percepts.....	9.55	2.80	10.25	2.01	-0.70	0.91
<i>Berg Stimuli</i>						
Impulsive Percepts.....	5.40	2.11	5.20	1.93	0.20	0.31
Socialized Percepts.....	5.55	2.06	6.00	1.89	-0.45	0.72
<i>Toch & Berg Stimuli</i>						
Violent & Impulsive Percepts.....	10.00	3.01	9.25	2.75	0.75	0.82
Neutral & Socialized Percepts.....	15.10	3.26	16.25	2.24	-1.15	1.30

all subjects who had histories of carrying a weapon were excluded from the non-violent sample.

3. Each "violent" subject was then paired with a "non-violent" subject with respect to race and grade placement. The members of each pair were matched within one grade level of each other as measured by the California Achievement Test. Age was homogeneous for the entire sample ranging from eighteen to twenty-two years with a median of approximately nineteen years.

This unusually rigorous gleaning procedure was employed in order to maximize our chances of selecting a clearly dichotomized sample on the "violence-non-violence" dimension with all violent cases strictly falling into the category of criminal violence, while other variables such as race, age, education, etc. were kept constant. The final samples consisted of twenty violent and twenty non-violent subjects. From the description of the violent sample below, it can be seen that situational violent offenders, where violence may be a climax to a non-criminal interpersonal crisis, were excluded in order to secure a relatively pure sample of violent behavior as an attribute of criminal acts.

Our final sample of violent offenders was composed of five murderers and six armed robbers, (one of whom murdered his victim), and the remainder had been committed for various assault and battery charges. Three of the murderers were involved in the same crime, which was unprovoked by the victim. The fourth had two crime partners, and shot his victims during an argument. All but one of the armed robbers had at least one crime partner. Two cases had rape as the apparent motive, two more had robbery as a motive, three were provoked by an argument or derogatory

remarks made by the victim, and the remaining three were attacks upon policemen who had arrested the defendants on other charges such as burglary. Thus, in only three out of twenty cases was the attack clearly provoked in part by the victim. In only three or four cases was alcohol or drugs an apparent contributing factor.

FINDINGS

The stereoscopic test was divided into two sections, the "Toch" and "Berg" tests. The former consists of the eight original pairs of slides each representing a "violent" and a "non-violent" scene. The latter is comprised of the six original pairs of slides representing an "impulsive" or "unsocialized" (but not necessarily violent) and a "non-impulsive" or "socialized" version of the same scene. "Toch" slides were scored for the total number of both "violent" and "non-violent" responses, while "Berg" slides were scored for both "impulsive" and "non-impulsive" responses. In addition, we combined "violence + impulsivity," and "non-violence + non-impulsivity," to form two additional scoring categories, giving six scores altogether. T-tests revealed no significant differences between violent and non-violent samples on any of these six scores. Descriptive statistics are given in Table I.

DISCUSSION

The failure to demonstrate significant differences with the potentially useful stereoscope merits detailed attention. If this technique can provide information about an individual's access-ordering of concepts or dispositions and if the specific themes of violence and impulsivity can be sub-

jected to testing with the help of a stereoscope, we should have obtained positive findings.

The failure of the stereoscopic test to discriminate between these two groups may be at least partially explained by the "cue effect."¹⁴ In contrast to most "normal" people, who generally report what they see, a prison inmate, particularly one who is in trouble because of violent acting out behavior, may possibly "see" the violent picture, yet report a neutral response. That is to say, a demand is set up by the total situation to pull for a specific role-performance. The subject might believe, for example, that reporting a violent response might get him into further trouble or increase the amount of time he spends in the institution. This problem merits further investigation before its actual effect on the stereoscopic test results can be ascertained. A preliminary finding on a larger previous sample lends support to the "cue effect" hypothesis, for it showed trends for the violent group to give fewer violent and impulsive responses than the non-violent group.

A trend in our refined sample appears to give support to a "cue effect" hypothesis. For control of possible effects of eye dominance the series of slides is shown twice to each individual. The second presentation with a reversed pattern follows immediately the first, so that each eye is presented once with the violent and once with the non-violent stimulus. It was observed that the violent sample produced 14 percent fewer violent percepts during the second presentation than during the first presentation, while the non-violent group increased their violent percepts by 20 percent during the second presentation. Also, open remarks by members of the violent group such as "What I see here is very bad for me as I had trouble all the time with knives on the outside," seemed to reflect some uneasiness in reporting violent percepts. We noted another observation that indicated some defensiveness on the part of the violent as well as the non-violent individuals. As described earlier, the slides were presented 0.5 seconds following the subject's sign of being ready. In many instances when the pictures perceived may have been some sort of a fusion, the subject could ask for another presentation. When several presentations were given at the subject's request, the final percepts reported were generally "neutral," quite "safe" responses. Our analysis suggests that several sub-

jects attempted to use the provision of multiple presentation for their own manipulative efforts.

The present findings are rather discouraging, in view of our search for techniques to identify violence-prone persons. However, the well-documented thesis that dispositional characteristics are determiners of perceptual response lead us to believe that the stereoscopic technique for investigating binocular resolutions has potential for the study of violence-proneness if the following precautions are observed:

1. Sufficient number of stimulus pairs to guard against eye dominance without having to repeat the series of slides.
2. Closer control of monocular dominance within stimulus pairs. Some slides appear to have a greater representation of one component relative to the other (*e.g.*, farmer with plow, mailman and beer mug scene appear among others to result in monocular dominance).
3. Design new slides with violence theme other than criminal violence.
4. Restrict presentation to only one exposure of 0.5 sec.
5. Facilitate clear responses and scoring procedure by a multiple choice method. Trials recently undertaken in which four cards are presented to subjects for choice of response after the slide exposure appear promising. The four choices are: first, clear description of the violent stimulus (*e.g.*, a man hitting another man with a club); second, clear description of the non-violent stimulus (*e.g.*, baseball players); third, a fake-good scene (*e.g.*, man fixing a motorcycle); fourth, a fake-bad scene (*e.g.*, man shooting another with a rifle). On our trials 98 percent of the chosen responses were of the first and second order.

Future investigations are planned with new stimuli and with the modifications in testing procedure described above.

SUMMARY

In an effort to develop a test to identify violence-prone offenders, we adapted the stereoscopic test developed by Toch and Schulte,¹⁵ and Berg and Toch.¹⁶ Our hypothesis, that a rigorously selected

¹⁵ Toch & Schulte, *supra* note 6.

¹⁶ Berg & Toch, *supra* note 8.

¹⁴ Kroger, *supra* note †.

sample of violent offenders would see and report more "violence" resolutions than a carefully matched sample of non-violent offenders, was not confirmed. Our hypothesis was consistent with the well-established principle that dispositional factors influence perception and with the relationships reported by other investigators between subject characteristics and the perception of violence.

This lack of convergence between our expectations and our findings directed us to an analysis of the experimental situation. This analysis suggested that subjects may respond to the "cue properties" of the binocular resolution and give a verbal report different from what they "saw" but congruent

with their unwarranted beliefs about the ultimate use of the test results. Some incidental data lend support to this analysis. The results of this experiment underscore the caution discussed by Kroger,¹⁷ Sarbin¹⁸ and others that the protocol upon which the diagnostician infers violence-proneness (or other dispositional characteristics) is the verbal report of the subject. Needless to add, the verbal report may or may not be faithful to what is perceived. We offered several suggestions for obtaining higher fidelity in the reporting of binocular resolutions.

¹⁷ Kroger, *supra* note †.

¹⁸ Sarbin, *supra* note †.