The stimulation-seeking motive: Relationship to apparent visual movement*

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It was hypothesized that extent and complexity of perceived autokinetic movement would be a significant function of individual differences in arousal seeking or the need for stimulation. Three scores—extension, rotation, and complexity—were derived from the autokinesis protocols of 31 Ss. Individual differences in stimulation seeking were measured by the sensation-seeking scale. No significant relationships of stimulation seeking and autokinetic parameters were obtained.

The autokinetic movement effect is one of the most venerable and earliest investigated of visual phenomena. Although it has been fraught with an early history of methodological problems, there now seems little doubt of the reliability of the phenomenon (Royce, Carran, Aftanas, Lehman & Blumenthal, 1966). Although notable individual differences in the extent and characteristics of the response have been consistently reported, very few sources of these individual differences in personality or cognitive factors have been identified (Royce et al, 1966). For example, Steisel (1952) was unable to replicate Sexton's (1945) finding of a significant correlation between Rorschach movement scores and reported autokinetic movement. Jakubszak and Walters (1959) were not able to replicate their own finding of a significant relationship between the trait of dependency and autokinetic suggestibility.

One problem in research on individual differences in apparent visual movement has been the lack of theoretical expectations where the trait variables are concerned. Some amelioration of this problem may be found in a personality-motivation dimension that has recently been demonstrated to be profoundly involved in perceptual phenomena, that is, stimulation seeking and the preference for varied experience (Farley, 1971). In discussion of this putative dimension, it has been argued that individuals vary in their need for environmental stimulation, on the hypothesis that underlying differences in characteristic physiological arousal levels lead to differences in stimulation seeking; from an optimal-level-of-stimulation viewpoint, it is further held that Ss low in arousal will seek stimulation so as to raise their arousal to a level optimal for effective psychological functioning, relative to Ss high in arousal who will attempt to maintain stimulation at a low level so as to reduce their arousal to such an optimal point (Farley, 1971). Such a dimension of stimulation seeking and preference for varied experience has been shown to be related to preference for visual complexity, with high "stimulation seekers" preferring complexity over

simplicity (Zuckerman, Neary, & Brustman, 1970), tolerance of sensory deprivation conditions, with high stimulation seekers demonstrating lower tolerance (Zuckerman, Persky, Hopkins, Murtaugh, Basu, & Schilling, 1966; but see Smith & Myers, 1966, and Zuckerman, Persky, Link & Basu, 1968), visual acuity, with high stimulation seekers demonstrating greater visual acuity (Palmer, 1970), and tolerance thresholds for environmental noise, with high stimulation seekers being more able to tolerate greater noise intensities (Farley & Kline, 1972). The high stimulation seeker not only seeks more stimulation, and more complex and varied stimuli relative to the low stimulation seeker, but he also generates more varied responses in a task allowing for degrees of repetition or variety of responding (Farley, 1971). The experimental conditions for the measurement of the autokinetic effect are such that in a dark room the only differentiated stimulus is a constant point source of light. It would be expected that under such a stimulus-reduced environment the stimulation-seeking S would attempt to generate stimulus variety through perceiving greater movement of the point source of light, perhaps through greater eye movement, which may be involved in the autokinetic effect (Matin & MacKinnon, 1964).

Thus, where apparent visual movement is concerned, it would be hypothesized that the high stimulation seeker would perceive greater movement, and would generate more extensive, varied and complex tracings of the visual stimulus than a low stimulation-seeking S.

The present experiment attempted to test the foregoing hypothesis.

METHOD

Subjects

Thirty-one students (23 females, 8 males) in an introductory undergraduate course on human learning and abilities served voluntarily as Ss.

Procedure

The measure of individual differences in stimulation seeking and preference for varied experience was the Sensation-Seeking Scale (Zuckerman, Kolin, Price, & Zoob, 1964). This is a self-report forced-choice factorially constructed inventory. The form of the test used was that consisting of 22 items that did not

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discriminate between the sexes in the original test development. This measure has been relatively well validated and is the most widely used in stimulation-seeking research (Farley, 1971). It has been shown to be free of major noncontent response set effects (Farley, 1967; Farley & Haubrich, 1974). An example item is: "I like to take off on a trip with no pre-planned or definite routes, or timetables" vs "When I go on a trip, I like to plan my route and timetable very carefully." All Ss were administered this scale.

Autokinetic movement was measured in a sound-reduced 10 x 5 ft inner room that was part of a six-room testing suite. During testing, the room was entirely dark except for a light source as described below. The S was seated in a conventional classroom chair such that his eyes were directly 8 ft from a 1-mm-diam point source of light. The S was instructed to focus his attention entirely on the light source, and not to move his head or shoulders. On a writing surface in front of the S was placed an 8½ x 11 in. sheet of white plain bond paper. A dot was located at the center of the paper. The S was instructed to rest his pencil on the dot until he perceived movement in the light. He was then to reproduce this movement by tracing on the paper. Each S was given a 60-sec test period followed by a 30-sec rest interval, which was in turn followed by a 180-sec test period. Each S used his preferred hand for tracing. Because of the darkness of the room, S was not able to view his paper during the test or rest sessions (different sheets were used for the two test sessions).

RESULTS AND DISCUSSION

Three measures were derived from the autokinesis protocols. An *extension* score was computed by counting the total number of ¼-in. squares entered by the tracing, using a transparent 8½ x 11 in. template divided into ¼-in. squares and laid over the S's response sheet. A *rotation* score was computed as the total number of octants of a circle entered by the tracing. The transparent scoring template in this case consisted of the octants of a circle the center of which was laid on the starting dot for the S's tracing, with the perimeters of the template and response sheet aligned. A *complexity* score was based on independent judges' ratings of the figural complexity of the tracing using a 1-7 point bipolar scale. Two judges were used, and the complexity score for a given protocol was based on the mean of their ratings. Each judge rated the 62 protocols (31 1-min and 31 3-min protocols) in a different random order. Two further judges independently scored the extension and rotation measures, again using a randomized order of protocols. The order of scoring the latter derived measures was extension followed by rotation. Interjudge reliability estimates for the three measures, using Pearson product-moment correlation, were: extension $r = .995$, rotation $r = .933$, complexity $r = .765$. All these values were significant at $p < .001$.

Univariate and multivariate analyses of variance were applied to the data (2 timed trials by 3 dependent measures with Ss divided at the median into 15 high and 15 low "sensation seekers"). No significant main or interaction effects were obtained. Simple and multivariate regression analyses using the full range of scores were subsequently undertaken. No significant regressions of any combination of the autokinesis variables on sensation seeking were obtained. It might be argued that the groups of high and low stimulation seekers in the experiment

were not extreme enough to lead one to expect differences in autokinetic movement. However, it might also be expected that if the relationship of stimulation seeking and autokinetic movement was strong enough to be worth considering, it would show up in such a comparison, or at least in the regression analyses that took into account the full range of scores.

The present results have clearly indicated no contribution of individual differences in sensation seeking to any of the autokinesis variables. Thus, the experimental hypothesis was not supported. Like most negative results, these are difficult to explain. They suggest, however, that autokinetic movement parameters are not a function of arousal and stimulation-seeking factors. It would be desirable, of course, to study these parameters during real-time physiological measurement so as to more directly test an arousal-autokinetic movement hypothesis. The attempt to relate personality self-report and *performance* variables has not been notably successful (Farley, 1968). Where individual differences in autokinetic movement variables are concerned, it would appear that almost no psychometrically identified individual differences are reliably involved, on the basis of available research.

REFERENCES

- Farley, F. H. Social desirability and dimensionality in the sensation-seeking scale. *Acta Psychologica*, 1967, 26, 89-96.
- Farley, F. H. Predicting physical persistence from an unobtrusive measure of "drive." *Journal of General Psychology*, 1968, 79, 279-282.
- Farley, F. H. Measures of individual differences in stimulation-seeking and the tendency toward variety. *Journal of Consulting & Clinical Psychology*, 1971, 37, 394-396.
- Farley, F. H., & Haubrich, A. S. Response set in the measurement of stimulation-seeking. *Educational & Psychological Measurement*, 1974, in press.
- Farley, F. H., & Kline, K. Unpublished study, University of Wisconsin, Madison, 1972.
- Jakubczak, L. F., & Walters, R. H. Suggestibility as dependency behavior. *Journal of Abnormal & Social Psychology*, 1959, 59, 102-107.
- Matin, L., & MacKinnon, G. E. Autokinetic movement: Selective manipulation of directional components of image stabilization. *Science*, 1964, 143, 147-148.
- Palmer, R. D. Visual acuity and stimulus-seeking behavior. *Psychosomatic Medicine*, 1970, 32, 277-284.
- Royce, J. R., Carran, A. B., Aftanas, M., Lehman, R. S., & Blumenthal, A. The autokinetic phenomenon: A critical review. *Psychological Bulletin*, 1966, 65, 243-260.
- Sexton, M. C. The autokinetic test: Its value in psychiatric diagnosis and prognosis. *American Journal of Psychiatry*, 1945, 102, 399-402.
- Smith, S., & Myers, T. I. Stimulation seeking during sensory deprivation. *Perceptual & Motor Skills*, 1966, 23, 1151-1163.
- Steisel, I. M. The Rorschach test and suggestibility. *Journal of Abnormal & Social Psychology*, 1952, 47, 607-614.
- Zuckerman, M., Kolin, E. A., Price, L., & Zoob, I. Development of a sensation-seeking scale. *Journal of Consulting Psychology*, 1964, 28, 477-482.
- Zuckerman, M., Neary, R. S., & Brustman, B. A. Sensation-seeking scale correlates in experience (smoking, drugs, alcohol, "hallucinations," and sex) and preference for complexity (designs). *Proceedings of the 78th Annual Convention of the American Psychological Association*, 1970, 317-318.
- Zuckerman, M., Persky, H., Hopkins, T. R., Murtaugh, T., Basu, G. K., & Schilling, M. Comparison of stress effects of perceptual and social isolation. *Archives of General Psychiatry*, 1966, 14, 356-365.
- Zuckerman, M., Persky, H., Link, K. E., & Basu, G. K. Experimental and subject factors determining responses to sensory deprivation, social isolation and confinement. *Journal of Abnormal Psychology*, 1968, 73, 183-194.

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