Fig. 2. Acquisition of trigrams for three levels of cue saliency.

that the mean of Sal 1 was significantly different from Sal 3 while all other comparisons were not. This suggests that seriation during output does serve to facilitate overall retrieval.

By manipulating cue saliency through the use of instructions and fragment cues, this study may well have met the requirements of optimal cueing suggested by Allen (1969). An analysis of the serial position effect for the three experimental groups revealed the typical inverted-U curve for Sal 1, but this effect was absent in Sal 2 and Sal 3. This would tend to agree with previous studies which show that Ss who effectively employ mnemonic structures fail to show the usual serial position effects (Persensky & Senter, 1969). Apparently, where organization was minimal in the Sal 1 condition, the serial nature of cueing during recall was not fully

utilized. The high levels of organization associated with Sal 2 and Sal 3 suggest there was little left in storage to cue since recall was optimal. The failure to find significant differences between Sal 2 and Sal 3 offers support for this interpretation.

The results of this study suggest the necessity for explicit clarification of elemental relationships when presenting Ss with a mnemonic structure. The failure of the E to clearly communicate the intended function of such paradigms will result in an inadequate utilization of the mnemonic and the introduction of unnecessary "error variance."

REFERENCES

- ALLEN, M. Cueing and retrieval in free recall. *Journal of Experimental Psychology*, 1969, 81, 29-35.
- GLANZER, M. Distance between related words in free recall: Trace of the STS. *Journal of Verbal Learning & Verbal Behavior*, 1969, 8, 105-111.
- MANDLER, G., & DEAN, P. Seriation: Development of serial order in free recall. *Journal of Experimental Psychology*, 1969, 81, 207-215.
- OLTON, R. The effect of a mnemonic upon the retention of paired-associate verbal material. *Journal of Verbal Learning & Verbal Behavior*, 1969, 8, 43-48.
- PERSENSKY, J. J., & SENTER, R. J. An experimental investigation of a mnemonic system in recall. *The Psychological Record*, 1969, 19, 491-499.
- UNDERWOOD, B. J., & SCHULZ, R. W. *Meaningfulness, and verbal learning*. Philadelphia: Lippincott, 1960.
- WINER, B. J. *Statistical principles in experimental design*. New York: McGraw-Hill, 1962.

magnitude it should have a greater effect upon the judgment of the series, but this has been demonstrated not to be the case.

Sarris² has suggested that the decline in the effectiveness of the anchor, even though it is further from the series values, is a function of "attention." Thus, one could say that although the physical magnitude of the anchor is increased, it is now perceptually "out of range," so to speak, and we do not attend to it. A class hypothesis is then implied. Once the anchor is judged outside of the stimulus class, based on the series values, it is not attended to.

To test Sarris's notion that attention has a role in the effectiveness of the anchor in a judgmental task, the following rationale was conceived.

Witkin et al (1962) have argued that people can be differentiated by their ability or inability "... to overcome an embedding context and to experience items as discrete from the field in which they are contained." Gardner et al (1959) have suggested that not only do people differ in their ability to differentiate stimuli from the context, but the Ss differ in the way they attend to aspects of the stimulus configuration. One who has been labeled as field independent could be defined as that person who has the ability to overcome the effect of contextual factors and select the stimuli from the field. Added to this is the extension that the field-independent person selectively attends to those parts of the stimulus field that are task relevant. Assuming that people can be so differentiated, it was hypothesized that an anchor should have a greater impact on the field-dependent Ss than on the field-independent Ss, since when asked to judge the numerosity of a series of random-dot patterns and told to ignore the anchor, the field-independent Ss should best be able to ignore the anchor.

Field independence and anchor effectiveness

JOSEPH A. STEGER and ERNEST GORELIK
State University of New York at Albany, Albany, N.Y. 12203

To test the notion that attention is the mediator of contextual influence, it was assumed that field-dependent Ss' judgments should reflect greater anchor effectiveness than field-independent Ss. The data did not support this hypothesis. Both field-dependent and field-independent Ss appear to be equally influenced by contextual effects in magnitude estimates.

The use of the anchor paradigm¹ to study contextual effects has been common and the fact that the anchor has an effect upon judgments is well established (see, for example, Adamson, 1967; Bevan, 1968; Brown, 1963; Helson, 1964; Sarris, 1967; White, Alter, Snow, & Thorne, 1968). The specific way in which the anchor functions in the judgment situation is, however, open

to question. Sarris (1967, 1969) has shown that the anchor, as its value is moved away from the series values, increases in its impact on judgment, reaches some value of maximum effectiveness and then decreases in its impact on judgment. This is noteworthy because the logical argument from physical parameters would seem to be that as the anchor increases in physical

SUBJECTS

Forty undergraduate students at the State University of New York at Albany were given the short form of Witkin's embedded figures test (EFT) (Jackson, 1956). From these 40 Ss, the 5 males and 5 females having the highest field-independent scores and the 5 males and 5 females having the lowest field-independent scores (from hereon called the field-dependent group) were chosen to be recalled for the judgment task. Thus, these 20 Ss were contacted about a week after they took the EFT and asked to participate in another experiment. On the evening that the judgmental phase of the study was conducted, all 10 of the field-independent Ss (5 males, 5 females) returned; however, only 8 of the

Table 1
The Mean Judgments of Numerosity for Field
Dependent and Independent Ss Under the
Anchor (150 Dots) Condition

Series in Number of Dots	Dependent Ss	Independent Ss
17	10.8	11.8
23	13.7	13.8
29	14.4	14.9
35	18.2	18.9
41	20.4	21.9

field-dependent Ss returned (4 males, 4 females).

APPARATUS

A series of five (17, 23, 29, 35, 41 dots) random black-dot patterns and one anchor pattern (150 dots) were photographed and 35-mm Full Frame 2 x 2 in. slides were prepared. A Kodak Carousel projector (Model 800) was modified to include a photographic shutter. This allowed the projection of the dot patterns at .1 sec.

PROCEDURE

As was noted above, the Ss were selected from their scores on the EFT, then contacted, and asked to return to participate in another experiment. Upon their return, the Ss were seated in a small-size classroom facing the front of the room. After being seated they were told that they would be shown slides of dots on the screen in the front of the room and instructed to estimate the number of dots flashed. Each S had a pencil and data sheet in front of him and each recorded his or her own estimate. The five random-dot patterns comprising the series stimuli were presented five times each in a random order via a table of random numbers. The slides were shown three times one side up and two times that same side down.

The Ss were then given a 10-min break. Following the break they returned to their seats where new data sheets were provided. The control judgment data sheets had been collected while they were on break. They were then instructed to estimate the number of dots on the second slide of a pair of slides to be presented sequentially and to ignore the first slide because it was only for control purposes. The E said "one" before the first slide (anchor of 150 dots) and "two" before the second slide

(the series). This provided a ready signal for judgment since the pair were presented within a 2-sec interval. The same random pattern of presentation for the series that was used in the control session was also used in the anchor session.

RESULTS

The mean judgments of both the field-independent and field-dependent Ss under the anchor condition are shown in Table 1. It is readily apparent that the anchor did not have a differential effect on the groups' judgments. This result was also reflected in the statistical analysis. The judgments of the field dependent and field independent were not reliably different ($F = 2.98$, $df = 1/160$, $p < .05$). The only statistically significant effects were produced by the anchor ($F = 36.67$, $df = 1/160$, $p < .05$) and the series numbers ($F = 30.30$, $df = 4/160$, $p < .05$). Thus, the judgments in the control condition were of greater magnitude than those in the anchor condition for both groups and the series members were judged to be of different magnitudes. Both of these effects are to be expected, although they have no direct bearing on the hypothesis under investigation.

DISCUSSION

It was suggested that a test of Sarris's notion that attention is the mediator of contextual influence was possible, using field-dependent and field-independent Ss to make magnitude estimates. Thus, the field-dependent Ss should attend more to the context (anchor) and hence their judgments should reflect a larger influence of the anchor than should those of the field-independent Ss. The data do not support this hypothesis. In this particular study, both groups appear to be equally influenced by the presence of the anchor.

There remains, however, the question of whether this was a fair test of Sarris's attention hypothesis. It was assumed that the field-dependent Ss would attend more to the context than would the field-independent Ss. But, as Anderson (1969) has pointed out, one could attend to the context and independently weigh the context heavily or not. Thus, one could question the logical extension of field dependence and independence to imply

attending to the context or not. However, Gardner et al (1959) have argued that field-independent Ss can selectively attend to task-relevant parts of the stimulus field. It would seem fair then to say that they should be able to better ignore parts of the field when told to do so than would the field-dependent Ss. This was not demonstrated to be true in this study.

It is suggested, then, that research is needed to clarify the Gardner et al (1959) hypothesis in view of both the present study's findings and Anderson's suggestion that attention and the weight given to the stimulus attended to are not necessarily synonymous.

REFERENCES

- ADAMSON, R. Anchor effect limits. *Psychonomic Science*, 1967, 9, 179-180.
- BEVAN, W. The contextual basis of behavior. *American Psychologist*, 1968, 23, 701-714.
- BROWN, D. R. Stimulus-similarity and the anchoring of subjective scales. *American Journal of Psychology*, 1963, 66, 199-214.
- GARDNER, R. W., HALZMAN, P. S., KLEIN, G. S., FINTON, H. B., & SPENCE, B. Cognitive control: A study of individual consistencies in cognitive behavior. *Psychological Issues*, 1959, 1, Whole No. 4.
- HELSON, H. *Adaptation-level theory*. New York: Harper & Row, 1964.
- JACKSON, D. N. A short form of Witkin's embedded figures test. *Journal of Abnormal & Social Psychology*, 1956, 53, 254-255.
- SARRIS, V. Adaptation level theory: Two critical experiments on Helson's weighted average model. *American Journal of Psychology*, 1967, 80, 331-344.
- SARRIS, V. Anchor-effects in psychophysics: Tests on the adaptation-level model. Paper given at XIX International Congress of Psychology, London, 1969.
- WHITE, B. J., ALTER, R. D., SNOW, M. E., & THORNE, D. B. Use of instructions and hypnosis to minimize anchor effects. *Journal of Experimental Psychology*, 1968, 77, 415-421.
- WITKIN, H. A., DYK, R. B., FATERSON, H. F., GOODENOUGH, D. R., & KARP, S. A. *Psychological differentiation*. New York: Wiley, 1962.

NOTES

1. The anchor paradigm refers to experiments where the second of two stimuli is to be judged but the S is told to ignore the first of the two stimuli.
2. V. Sarris, personal communication, 1968.
3. N. Anderson, personal communication, December 16, 1969.