Mixed social structures: Strain and probability ratings

ROBERT B. HORSFALL, *Johns Hopkins University, Baltimore, Md. 21218*, and NANCY M. HENLEY, *University of Maryland, Baltimore County, Baltimore, Md. 21228*

Hypothetical triadic social structures formed of mixed liking and influence relations were rated by Ss either for strain or for probability. Structures having one or three negative affective relations, or a full cycle of influence, were rated as unpleasant and improbable. The correlation between strain and probability mean ratings was $-.87$.

Most research on the structure of interpersonal relations has been concerned either solely with affective (e.g., liking) relations, or solely with power (e.g., influence) relations. Henley, Horsfall, & De Soto (in press) have pointed out that any real-life group will contain mixtures of such relations, and have suggested an intensive examination of interpersonal structures composed of mixed liking and influence relations. A study of this sort has been reported by Lewit (1963); others studying mixtures of symmetric and asymmetric relations have been De Soto (1960) and Mandler & Cowan (1962).

In investigating mixed social structures, it seems desirable to deal first with the most elementary structures, then with more complex structures, making use of results found with simple structures. Formal properties of the simplest social structure, the dyad, have been studied by De Soto & Kuethe (1959). The present study investigates triadic structures through ratings of subjective probability and strain. [It may be noted here that the first published test of Heider's (1946) balance theory was a similar rating study of triadic structures (Jordan, 1953).]

In the Henley, Horsfall, & De Soto paper, the notion of *conceptual good figure* (De Soto & Albrecht, 1968a, b) is applied to mixed (liking and influence) structures, and support is offered for the hypothesis that structures with one or more cycles (sets of relations in which, e.g., A influences B, B influences C, and C influences A) are "bad figure," while structures with no cycles (sets of relations in which, e.g., A influences B, B influences C, and A influences C) are in some sense "good figure." In their interpretation, power "flows through" liking relations in both directions; because of this, a structure made of two symmetric liking relations and a single asymmetric influence relation

contains a cycle, and is "bad figure." Support for this hypothesis comes from previously conducted learning experiments; however, it should apply to other experimental tasks.

Structures which are "good figure" should be (1) more easily learned, (2) less unpleasant to contemplate or be a part of, and (3) expected to occur more often (more probable). In addition, the property of "good figure" should hold over a wide range of relations (e.g., influences, likes, is boss of, is a friend of). The research reported in this paper is aimed at finding out just what types of elementary triadic social structures are "good figure" in the sense of being rated as relatively pleasant and/or probable, and at determining whether "good figure" is indeed applicable to different asymmetric relations.

METHOD

Subjects were 83 male and female adult night school students, 46 of whom served in

the strain portion of the study; 37 others participated in the subjective probability portion.

Sixteen basic structures (Fig. 1) may be formed by taking all possible triadic combinations of the three relationships, "friends," "enemies," and "is boss of." Ss rated these 16 structures for strain, on 11-point scales in booklets in which one structure was presented on each page. Each structure was presented as a set of statements about three persons, e.g. (Structure 15 in Fig. 1):

Steve is a friend of Grant.

Chris is an enemy of Grant.

Steve is the boss of Chris.

Ss were told to "rate each situation for amount of strain. Take each situation as a whole; do not put yourself in the place of any one individual in the situation." The scale was end-anchored by the words "least" (at the 0 end) and "most" (at the 10 end).

In the probability study, the structures, composed of "friends," "enemies," and "influences," were presented as follows (Structure 15):

Bill influences Carl.

Bill and Fred are friends.

How probable is it that Fred and Carl are

Fig. 1. Strain and probability ratings of mixed triadic structures.

enemies? Ss were told to "read the two relationships given on a page and understand them, then estimate the probability of the third relationship . . . Assume that within a given set, all persons are acquainted and have some relationship." The scale was anchored by the words "impossible" (0% probable) and "certain" (100% probable).

RESULTS

Mean strain and probability ratings for the 16 structures are shown in Fig. 1. The correlation between these two sets of means is $-.87$.

If the formulation offered by Henley, Horsfall, & De Soto provides an adequate description of goodness of figure, and if ratings are an appropriate index of that goodness, mean ratings for "good" and "bad" structures should be significantly different. The structures formed of asymmetric and mixed relations were classified (as "good" or "bad") in accordance with the Henley, Horsfall, & De Soto formulation; those formed of symmetric relations only were identified as balanced ("good") or unbalanced ("bad") according to balance theory (Cartwright & Harary, 1956). Under this system, Structures 2, 4, 7, 11, and 13 are "bad." However, this classification results in no significant differences for either strain or probability ratings (Table 1).

Closer examination of ratings for these figures reveals that those with one or three negative lines are generally rated as relatively high in strain and low in probability. The structures were reclassified, this time the "bad figure" structures being identified as those with an odd number of negative lines, or a completely asymmetric power cycle (Structures 2, 4, 7, 8, 10, 12, 15, 16). The means under this classification are shown in Table 2. These differences are statistically significant by the t test: for strain, $t = 96.90$, $df = 14$; for probability, $t = 21.80$, $df = 14$. In both cases, the probability (one-tailed) of such a large difference is less than .0005. Individual Ss' means for good vs bad structures were compared by the sign test. For the strain ratings, 39 of the 46 comparisons were in the expected direction ($z = 4.57$, $p < .00003$); for the probability ratings, all 37 comparisons were in the expected direction.

DISCUSSION

Some interesting inferences may be drawn from the high correlation between strain and probability ratings. First, there is

Table 1
Mean Strain and Probability Ratings of Structures Divided into Good and Bad Figure (Henley, Horsfall, & De Soto Classification).

	Good	Bad
Strain	4.25	4.67
Probability	4.55	4.50

Table 2
Mean Strain and Probability Ratings of Structures Reclassified (see text).

	Good	Bad
Strain	3.04	5.73
Probability	5.56	3.51

some generality over types of asymmetric relations: "influences" and "is boss of" are essentially interchangeable in this context. Second, the strain and probability rating dimensions seem interchangeable to some degree as experimental devices for measuring goodness of figure. Third, the correlation suggests that this sort of rating task yields reliable results.

Significant differences in ratings of "good" and "bad" figures were obtained only when the structures were divided according to the second scheme, that is, when a structure with one or three negative lines, or an asymmetric power cycle, was considered "bad." Students of balance theory will recognize a correspondence between these findings and those of balance theorists, for whom an odd number of negative lines (in elemental structures) is considered unbalancing (Cartwright & Harary, 1956; Heider, 1958).

Obviously, the results of this experiment are not consistent with the results from the learning experiments cited by Henley, Horsfall, & De Soto. The explanation might well lie in task differences, i.e., learning vs rating, and may be artifactual. On the other hand, there are implications for real-life situations. In cognizing social structures, people might be able to discern

and recall well interpersonal relationships in structures which they would find unpleasant or which are unlikely to occur.

REFERENCES

- CARTWRIGHT, D., & HARARY, F. Structural balance: A generalization of Heider's theory. *Psychological Review*, 1956, 63, 277-292.
- De SOTO, C. B. Learning a social structure. *Journal of Abnormal & Social Psychology*, 1960, 60, 417-421.
- De SOTO, C. B., & ALBRECHT, F. Conceptual good figures. In R. P. Abelson, E. Aronson, W. J. McGuire, T. M. Newcomb, M. J. Rosenberg, and P. H. Tannenbaum (Eds.), *Theories of cognitive consistency: A sourcebook*. Skokie, Ill.: Rand McNally, 1968a. Chap. 45.
- De SOTO, C. B., & ALBRECHT, F. Cognition and social orderings. In R. P. Abelson, E. Aronson, W. J. McGuire, T. M. Newcomb, M. J. Rosenberg, and P. H. Tannenbaum (Eds.), *Theories of cognitive consistency: A sourcebook*. Skokie, Ill.: Rand McNally, 1968b. Chap. 49.
- De SOTO, C. B., & KUETHE, J. L. Subjective probabilities of interpersonal relationships. *Journal of Abnormal & Social Psychology*, 1959, 59, 290-294.
- HEIDER, F. Attitudes and cognitive organization. *Journal of Psychology*, 1946, 21, 107-112.
- HEIDER, F. *The psychology of interpersonal relations*. New York: Wiley, 1958.
- HENLEY, N. M., HORSFALL, R. B., & De SOTO, C. B. Goodness of figure and social structure. *Psychological Review*, in press.
- JORDAN, N. Behavioral forces that are a function of attitudes and of cognitive organization. *Human Relations*, 1953, 6, 273-287.
- LEWIT, D. W. The learning of mixed power/liking relationships in small social structures. Paper presented at the meeting of the Eastern Psychological Association, New York, April 1963.
- MANDLER, G., & COWAN, P. Learning of simple structures. *Journal of Experimental Psychology*, 1962, 64, 177-183.

Transfer of response from compound conditioned stimuli¹

WILLIAM W. GRINGS, University of Southern California, Los Angeles, Calif. 90007

Forty Ss were given discrimination conditioning of the GSR with one CS (a pair of colored dots) accompanied by a shock, and a second CS (also a pair of colored dots) not accompanied by shock. An acquisition series was followed by a transfer test series including the original compound stimuli, the

individual components, and new compounds formed by different pairing of the components. Discrimination conditioning was established but differential responding did not transfer to the components. Maximum response was obtained to new combinations (pairs) of the original components.

Recent investigations of compound stimulus conditioning of the GSR from this