Br. J. soc. clin. Psychol. (1972), 11, pp. 109–114
Printed in Great Britain

Is Risky Shift Due to Disproportionate Influence by Extreme Group Members?

BY DAVID G. MYERS

Hope College, Holland, Michigan

AND PETER J. MURDOCH

Center for Creative Leadership, Greensboro, North Carolina

The extremity-influence explanation of risky and cautious shifts is examined in two ways. First, mathematical models based on the assumption that extreme initial responders have more influence than moderates are derived from congruity theory. Their success at predicting group decisions is compared with the simple averaging of initial responses. Second, influence is defined in terms of talking time and correlated with initial extremity. Both analyses fail to support the hypothesis that extreme responders to an item exert greater influence than less extreme responders.

Considerable research has indicated that after discussion of different 'choice dilemma' items, group decisions on an item average more extreme than the mean of prediscussion decisions (for reviews see Clark, 1971; Dion *et al.*, 1970; Vinokur, 1971). Items which tend to elicit risky initial responses also tend to yield *risky shift*: greater risk-taking following discussion. Items which tend to elicit cautious initial responses tend to yield *cautious shift:* increased caution following discussion (e.g. Teger & Pruitt, 1967; Myers *et al.*, 1970).

The extremity-influence hypothesis is one of several suggested explanations of this risky–cautious shift phenomenon. Those making the most extreme initial decisions on an item may have the greatest commitment and knowledge and hence be most influential in discussion. The widely reported U-shaped relation between attitude extremity and intensity (e.g. Krech *et al.*, 1962) is consistent with this idea, as is Eisinger & Mills' (1968) finding that an extreme communicator on one's side of an issue will be perceived as more sincere and competent than a moderate. The extremity-influence hypothesis differs from the related notion of a correlation between leadership ability and general riskiness or extremity (e.g. Hoyt & Stoner, 1968; Rim, 1966). According to extremity-influence, greatest influence in a given discussion is exerted by those most extreme on *that item.* Group risk-taking studies by Burns (1967) and Clausen (1965) offer indirect support for the extremity-influence explanation. More direct support for the hypothesis was obtained in a careful study by Ellis *et al.* (1969). They found no significant risky shifts in treatment groups composed of persons with equal initial extremity on specific items but obtained significant shifts in control groups composed randomly. This homogeneous groups treatment may also have manipulated concomitant variables (e.g. reducing the social comparison effects implied by value theory, see Willems & Clark, 1971).

Hence the extremity-influence hypothesis should be further explored in heterogeneous groups.

The present paper examines the extremity-influence hypothesis in two independent ways. The first way involved constructing a mathematical model based on the assumption that extreme initial responders carry more weight than moderates. A clue as to how this might be done was provided by the congruity model of attitude change (Osgood *et al.*, 1957) which assumes that the resistance to change of an attitude object is proportional to its extremity or polarity. For example, if an object with a score of +3 on a generalized attitude scale becomes associated with a +2 object, they are predicted to converge at an equilibrium point of +2·5, which is more extreme than the initial mean of +2·0. Extending this to any group discussion situation with n participants results in a simple *congruity extension model* for predicting group outcomes:

Predicted extremity outcome =

$$(e_1|e_1|/E)+(e_2|e_2|/E)+\cdots+(e_n|e_n|/E), \qquad (1)$$

where e_i is an individual's extremity score relative to some defined neutral point and where $E=\sum|e_i|$. For example, if initial extremity scores of four participants were +3, +2, +1, 0, the predicted group extremity score would be $(3.3/6)+(2.2/6)+(1.1/6)+(0.0/6)=+2{\cdot}35$. which is more extreme than the initial mean of +1·5. The success of this model may be compared with the simple averaging of initial decisions.

As with Burns' (1967) mathematical model of extremity-influence effects, the predicted extremity outcome is a function of the initial extremity of the group and the heterogeneity of initial decisions within the group. The model's general predictions (1) that group decisions will be more extreme than the initial mean, and (2) that shift will increase with variability among the initial responses, can also be derived from competing explanations of risky and cautious shifts (e.g. discussion arguments enhance dominant initial values; social comparison effects are greatest in heterogeneous groups). Thus, if the model proves to be more successful than averaging, this would not provide unequivocal support for the extremity-influence hypothesis. However, lack of predictive power by the model would be embarrassing, because it is a direct application of extremity-influence assumptions.

The extremity-influence hypothesis also suggests that a committed and influential extreme responder would be more talkative than a neutral moderate (see Pruitt, 1971*a*). The logic of the hypothesis implies that extremists become assertively involved because of their confident commitment and because they persuasively communicate their information. Also, studies in group problem-solving have indicated that amount of verbal participation is related to influence (Jaffee & Lucas, 1969; Riecken, 1958; although Kogan & Doise, 1969, have proposed that this talking-influence relation may not extend to risk-taking discussions). In line with the suggestion of Dion *et al.* (1970) that direct observation of discussion may be the best way to test hypotheses relating initial risk and persuasiveness, influence was here defined as the proportion of talking time contributed by each subject in discussion. Correlating this measure with initial extremity will ascertain whether extremity of response to an item predicts amount of discussion activity.

METHOD

Subjects

The analyses were performed on data collected by Myers *et al.* (1970, Expt. 1). Fifteen four-person and five three-person groups of volunteers from introductory psychology classes were composed on the basis of anxiety and defensiveness scores (which were found to be unrelated to group shifts). Ten of the groups were all male and the other ten had all female participants.

Materials

Six choice-dilemma type problems were selected from previous research (Myers, 1967; Kogan & Wallach, 1964; Nordhøy, 1962). Three of these items had produced initial and shift responses in the risky direction, and three elicited initial and shift responses in the cautious direction.

Procedure

Subjects were seated around a V-shaped table which faced a one-way mirror. They were each given a booklet containing instructions and the six items (in random order for each group except that the first three items were never all risk-oriented or caution-oriented). Following completion of this prediscussion measure, the group members were given new identical copies of the booklet and verbal instructions to arrive at a unanimous consensus on each item. An experimental assistant behind the one-way mirror either video-taped the experiment for later analysis of talking times or electrically cumulated the talking time of each participant on each item.

RESULTS AND DISCUSSION

Congruity extension model

Predictions derived from the congruity extension model of extremity-influence processes were computed for 115 discussions which resulted in consensus (five discussions did not reach consensus). The predicted extremity score was calculated by means of eqn. (1), with 5·5 as the neutral point of the risk-taking scale (the midpoint of the scale's effective range of 1 in 10 to 10 in 10).

Table 1 compares the results of these predictions with a simple averaging procedure. The model was obviously more successful than mere averaging at predicting the mean consensus decisions on an item. This was expected since the model generally predicts group decisions more extreme than the initial average. Of greater interest is whether the model was more successful than averaging at predicting results of particular discussions. For each of the 115 consensus decisions, we compared the error score of the congruity extension model (absolute deviation of prediction from actual consensus) with the error score of the averaging procedure (absolute deviation of prediscussion average from consensus). A t test for related measures indicated that the congruity extension model did not predict significantly better than mere averaging ($t = 1{\cdot}41$; d.f. $= 114$).

Perhaps the congruity extension model allocates too much weight to extreme scores, for example, by giving an extremity score of 2 twice the weight of an extremity score of 1. The extra weight attributed to extreme scores could be dampened by taking their square roots. Such a *square-root model* is defined as:

Predicted extremity outcome =

$$[e_1\sqrt{(|e_1|)}/E] + [e_2\sqrt{(|e_2|)}/E] + \cdots + [e_n\sqrt{(|e_n|)}/E], \qquad (2)$$

where e_i is defined as before and $E = \sum\sqrt{|e_i|}$. However, the square-root weight is

merely one of an infinite universe of weighting functions. Nevertheless, the square-root model was significantly better than simple averaging ($t = 2{\cdot}62$; d.f. $= 114$; $P < 0{\cdot}02$), which is consistent with the extremity-influence hypothesis. This could be due to reasons other than those implied by the assumptions of the model because the items were known to elicit either risky or cautious shifts (a general prediction by the congruity models). A cross-validation of these models was therefore performed on a variety of items from Myers & Arenson (1970). Neither the congruity extension nor the square-root model was significantly better than the simple averaging model at predicting specific consensus decisions.

Table 1. *Group decisions predicted by congruity extension, simple averaging and square-root models*

Model	$\lvert \bar{D} \rvert$ *	Item 1	2	3	4	5	6
Congruity extension	0·85	3·61	2·27	2·91	7·66	7·48	7·96
Simple averaging	0·93	4·29	2·88	3·56	7·41	6·98	7·49
Square root	0·83	3·92	2·55	3·19	7·55	7·26	7·75
Actual consensus		3·63	2·05	2·84	8·11	7·47	8·10

* $\lvert \bar{D} \rvert$ is the mean absolute difference between predicted and observed outcomes.

The congruity models also suffer from the arbitrary use of 5·5 in 10 as the neutral point of the risky–cautious continuum. Myers & Arenson (1970) defined neutrality on a *post hoc* basis as the point of zero expected shift and obtained an estimate of 6·67 in 10. Applying this neutral point to the Myers & Arenson (1970) data from 40 groups and 12 items, neither the congruity extension nor the square-root model predicted specific consensus decisions significantly better than simple averaging.

Talking proportions

From video-tapes which were made of 11 of the four-person discussions, two observers independently cumulated (by pressing keys attached to electric timers) the total time spent talking by each participant on each item. These times were converted to proportions, an inter-observer correlation of 0·88 obtained, and the two observers' proportions averaged. For three other four-person groups, it was possible for an observer to record discussion times directly on the timers. (Data from three-person groups were not included since their talking proportions would average 0·33 and thus not be comparable with the four-person group data.) These talking proportions by each participant on each item were then correlated with three extremity measures: the absolute deviation of his initial response from 5·5; the difference between his extremity score and that of the least extreme member; and the absolute deviation of his initial response from the group's initial mean. Over all participants and items, the respective correlations between talking proportion and the three extremity measures were 0·03, 0·04 and 0·04. Thus, defining influence in terms of talking time also provided no support for the hypothesis that group shifts occur because extreme individuals are disproportionately influential.

The talking–initial response relation can be examined in a way that overlaps the above. Pruitt (1971*b*) concludes that one question in need of answer is: 'Are group members who take greater initial risk more talkative on risk-orientated items and less talkative on caution-orientated items?' Correlating talking proportions with individual initial responses resulted in a correlation of −0·05 across the three risk-orientated items and +0·08 for the three caution-orientated items. (This analysis was performed with data from the 11 video-taped groups.)

We conclude that although shift is reduced when all group members are of equal initial extremity (Ellis *et al.*, 1969; Willems & Clark, 1971), the present analyses do not support the extremity-influence interpretation of this homogeneity grouping effect.

This research was funded by grants to the first author from the National Institute of Mental Health (MH-15999-01) and the National Science Foundation (GS 2891). Appreciation is expressed to Neil Blahut and George Bishop for assistance in conducting and analysing the data.

REFERENCES

Burns, J. F. (1967). An extremity-variance analysis of group decisions involving risk. (Unpublished doctoral dissertation, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Mass.)

Clark, R. D., III (1971). Group-induced shift towards risk: a critical appraisal. *Psychol. Bull.* **76**, 251–270.

Clausen, G. S. T. (1965). Risk taking in small groups. (Unpublished doctoral dissertation, University of Michigan.)

Dion, K. L., Baron, R. S. & Miller, N. (1970). Why do groups make riskier decisions than individuals? In L. Berkowitz (ed.), *Advances in Experimental Social Psychology*, vol. 5. New York: Academic Press.

Ebsinger, R. & Mills, J. (1968). Perception of the sincerity and competence of a communicator as a function of the extremity of his position. *J. exp. soc. Psychol.* **4**, 224–232.

Ellis, H. D., Spencer, C. P. & Oldfield-Box, H. (1969). Matched groups and the risky shift phenomenon: a defence of the extreme member hypothesis. *Br. J. soc. clin. Psychol.* **8**, 333–339.

Hoyt, G. C. & Stoner, J. A. F. (1968). Leadership and group decisions involving risk. *J. exp. soc. Psychol.* **4**, 275–284.

Jaffee, C. L. & Lucas, R. L. (1969). Effects of rates of talking and correctness of decisions on leader choice in small groups. *J. soc. Psychol.* **79**, 247–254.

Kogan, N. & Doise, W. (1969). Effects of anticipated delegate status on level of risk taking in small decision-making groups. *Acta psychol.* **29**, 228–243.

Kogan, N. & Wallach, M. A. (1964). *Risk Taking: A Study in Cognition and Personality*. New York: Holt, Rinehart & Winston.

Krech, D., Crutchfield, R. S. & Ballachey, E. L. (1962). *Individual in Society*. New York: McGraw-Hill.

Myers, D. G. (1967). Enhancement of initial risk taking tendencies in social situations. (Unpublished doctoral dissertation, University of Iowa.)

Myers, D. G. & Arenson, S. J. (1970). Enhancement of initial risk tendencies in group discussion. (Unpublished manuscript, Hope College, Holland, Michigan.)

Myers, D. G., Murdoch, P. & Smith, G. F. (1970). Responsibility diffusion and drive enhancement effects on risky shift. *J. Personality* **38**, 418–425.

Nordhøy, F. (1962). Group interaction in decision-making under risk. (Unpublished master's thesis, Massachusetts Institute of Technology.)

Osgood, C. E., Suci, G. J. & Tannenbaum, P. H. (1957). *The Measurement of Meaning*. Urbana, Ill.: University of Illinois Press.

PRUITT, D. G. (1971*a*). Choice shifts in group discussion: an introductory review. *J. Person. soc. Psychol.* **20**, 339–360.

PRUITT, D. G. (1971*b*). Conclusions: toward an understanding of choice shifts in group discussion. *J. Person. soc. Psychol.* **20**, 495–510.

RIECKEN, H. W. (1958). The effect of talkativeness on ability to influence group solutions of problems. *Sociometry* **21**, 309–321.

RIM, Y. (1966). Who are the risk-takers in decision-making? *Personnel Adm.* **29**, 26–30.

TEGER, A. I. & PRUITT, D. G. (1967). Components of group risk taking. *J. exp. soc. Psychol.* **3**, 189–205.

VINOKUR, A. (1971). A review and theoretical analysis of the effects of group processes upon individual and group decisions involving risk. *Psychol. Bull.* **76**, 231–250.

WILLEMS, E. P. & CLARK, R. D., III. (1971). Shift toward risk and heterogeneity of groups. *J. exp. soc. Psychol.* **7**, 304–312.

Manuscript received 21 *September* 1970

Revised manuscript received 30 *July* 1971