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**Personality, Perceptions of the Adversary,**

**and Plans to Cooperate in a Two-Person,**

**Mixed-Motive Game**

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Lois Swirsky Gold

March 28, 1968

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ABSTRACT

This paper reports on an investigation of both long-term behavior (i.e., personality and attitude) and short-term behavior (pre-game perceptions of the adversary), as these behaviors are related to pre-game orientation toward bargaining in a two-person, mixed-motive game. The following general hypotheses were supported by the data: (1) In an ambiguous situation where bargainers have little empirical knowledge of the adversary on which to base their perceptions or plans, long-term characteristics of personality and attitude affect pre-interaction psychological behavior. (2) In the interdependent environment of a mixed-motive game, perceptions of the adversary are related to plans to cooperate or not. How ego expects alter to act may affect how ego himself plans to act; ego's perceptions of alter may be influenced by how ego wants and plans to behave. (3) When information is provided about some of the adversary's beliefs, and these beliefs are in disagreement with those of ego, stereotypic images of people who hold such beliefs are called forth; these are reflected in ego's perceptions of the adversary.

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In order to understand the bargaining process, and to make cross-study comparisons in game research, it is necessary to investigate the psychological behavior of the bargainers both before and during the game. Most researchers have not reported this kind of data; thus, it has not been possible either to explain precisely why different results have been obtained from experiments investigating the same variable or to know what subjects were thinking when they made certain choices. Some investigators have gathered data on the general orientation to the situation, the perceptions and plans before game play. Shure, Meeker, Moore, and Kelley (1965) have shown that pregame plans to cooperate, and perceptions of the operator's job, were related to cooperative or competitive choices in the channel game. Swirsky (1967) has shown that pregame plans were related to early game behavior, which in turn was related to late game behavior.

This paper reports on an investigation of the interrelationships among characteristics of the individual (personality/attitude), pregame perceptions of the adversary, and pregame plans to cooperate or not. The effects of providing information about beliefs of the adversary, when these are in disagreement with one's own, are discussed. Specifically, the variables under investigation here are measures of personal belligerence and authoritarian nationalism (Shure and Meeker, 1967), perceptions of the other player on six dimensions, and overall plans to cooperate or not in the bargaining process. All data were gathered prior to any interaction among bargainers.

Method and Procedure

A new game, the Conflict Board, was used for two experiments in which 160 undergraduate men at Stanford participated. The Conflict Board is a mixed-motive game that is similar to Sawyer's Interaction Screen, and was developed by Paul Ekman and Lois Swirsky Gold (Ekman, 1965 and Swirsky, 1967). Two players who do not see each other work levers at their consoles to move a ball around a large board; the apparatus presents the subjects with a number of choice situations as the ball moves around the board. On the board are seven colored

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areas, and each time the ball contacts one of them an outcome is achieved. The payoffs afford the players a choice of low risk and low reward or high risk and high reward within the framework of a Prisoner's Dilemma-type situation. Players have complete knowledge about where the ball is at every moment, but they must infer the adversary's plans and intentions from these actions. Play is continuous, strategies may be changed at any time and may be implemented in many ways, and complex patterns of signaling and deception are possible. Uncertainty is achieved by random loss of control over the movement of the ball for each subject.

In the two experiments reported here, real monetary incentives were used, and subjects could earn up to \$10.00. An individualistic orientation was provided. The selection procedures differed in the two experiments: subjects were chosen on the basis of scores on personal belligerence in Experiment 1 and on authoritarian nationalism in Experiment 2; the range of scores was approximately the same for both experiments on both variables. In Experiment 1, consisting of 33 pairs of subjects, no information was provided about the adversary. Pregame data were gathered on belligerence, nationalism, and plans to cooperate. In Experiment 2, truthful information was provided about the adversary in the form of his replies to items on the nationalism scale. In each of 47 pairs, one subject was a high nationalist and the other an internationalist (top and bottom thirds of the distribution). Each subject was told that the other's beliefs were in disagreement with his own, and both were read two issues from the nationalism scale on which they disagreed. In this experiment, pregame data were gathered on perceptions of the adversary on six semantic differentials (see Figure 1, Appendix), as well as on belligerence, nationalism, and plans to cooperate. The perceptual dimensions used here were selected because they were found relevant to bargaining and policy making in other studies (Deutsch, 1958; Osgood, Suci, and Tannenbaum, 1957; Ekman, Tufte, Archibald, and Brody, 1966).

### Results and Discussion

In Experiment 1, where information was not provided about the adversary, neither individual characteristic--belligerence or nationalism--was related to pregame plans to cooperate or not. The absence of this relationship has also been reported by Shure, *et al.* (1965). In Experiment 2, where information about disagreement on issues was provided, this relationship became significant: Internationalists were more likely to plan to cooperate, and nationalists to plan not to cooperate ( $\chi^2$ ,  $p < .01$ ). Moreover, belligerence had an additive effect: Internationalists who were also low belligerents were most likely to plan to cooperate and nationalists who were high belligerents were most likely to plan not to cooperate. Thus there was an interaction between one's own personality and information about the other. The data are presented in Table 1.

One might have expected that in the environment of Experiment 1, without information about the adversary, personality/attitude characteristics would have an even greater effect on plans than if the environment were structured by introducing this information. However, the results here suggest that only when ego knows something about alter do his own individual characteristics become significantly correlated with his plans; in the absence of information about the other player, it would appear that situational factors, more than personality attributes, account for plans. Thus it has been argued elsewhere that the knowledge that one's adversary is a student like oneself, and that the outcomes are symmetrical, evokes norms about fairness (Shure et al., 1965). Indeed, over 50% of the subjects planned to cooperate prior to their first encounter in the game.

With information that the other player's beliefs were in disagreement with one's own, nationalism and belligerence were related to plans. Nationalists, knowing that their opponents were internationalists, planned to compete; internationalists planned to cooperate. Can the perceptions of the adversary explain why? The six perceptual dimensions clustered into two groups, and standard score indices were constructed for each cluster. Perceptions did differ for nationalists and internationalists. Internationalists tended to perceive nationalists as more tough (i.e., strong, active, and likely to get tough when threatened), and nationalists tended to perceive internationalists as less tough (i.e., weak, passive, and likely to yield to threats). The data are reported in Table 2. (There were no differences between nationalists and internationalists in their perceptions of trustworthiness.) Thus, nationalists, perceiving the other player as yielding, planned not to cooperate; they had reason to suspect that they could succeed with a strategy of exploitation. Internationalists, perceiving the other player as tough, could not expect to succeed by exploitation, and thus planned to cooperate. Again, there is an additive effect of belligerence when looked at in conjunction with nationalism. Internationalists who were personally conciliatory were most likely to perceive their nationalist adversaries as tough, and nationalists who were personally belligerent were most likely to perceive their internationalist adversaries as yielding. The data are reported in Figure 2. Thus, we may conclude that the plans of nationalists and internationalists differed, that the personality characteristic of belligerence interacted with nationalism, and that plans were at least logical on the basis of the perceptions of the adversary.

The way in which perceptions themselves were related to plans remains to be tested. Certainly it can be said that the two sets of perceptions, individually, affected subjects' plans. Looking first at the two sets of perceptions individually, both are related to plans. Those subjects who perceived the adversary as more tough were more likely to plan to cooperate than those who perceived him as yielding. Since exploitation would not succeed with a tough adversary, this cooperative planning was a strategy consistent with one's expectations. Since a yielding adversary could be successfully exploited, planning not to cooperate with him was also sensible. Those subjects who perceived the adversary as more trustworthy were more likely to plan to cooperate than those who perceived him as

less trustworthy. The same kind of consistent thinking is in evidence here: Perceivers of trust and toughness were most likely to plan to cooperate, and perceivers of no trust and no toughness were least likely to plan to cooperate. The other two groups lie between these, and there is almost no difference between them. Put somewhat differently, if ego perceived alter as trustworthy, he was more likely to plan to cooperate if he also perceived alter as tough. If ego perceived alter as untrustworthy, he was more likely to plan not to cooperate if he also perceived him as not tough. These data are presented in Tables 3 and 4, and in Figure 3.

### Conclusion

It has been demonstrated that when information is provided about the adversary there is a meaningful interrelationship among personality/attitude of the bargainer, pregame perceptions of the adversary, and pregame plans to cooperate or not; this relationship was not found between personality and plans without such information. Since no perceptual data were gathered in the no-information experiment, we are unable to explain further why certain subjects had plans to cooperate and others did not. We have hypothesized that situational factors contributing to norms of fairness may explain plans when no information about the adversary is provided.

The findings concerned with perceptions of alter tend to support ideas of Deutsch (1958), who emphasized the importance of trust in cooperation and competition. The relevance of nationalism and belligerence to pregame perceptions and plans support findings of Shure *et al.* (1965), as well as the findings of those who have investigated the relationships among F scale or nationalism, and game behaviors. The strong interrelationships among individual characteristics, perceptions, and plans suggest that subjects may be more strategic, or at least consistent, in their game plans than some investigators have suggested they might be.

Pregame data of the kind reported here provide a means for comparing the results of various experiments. If data were available, for example, on the pregame bargaining orientation and perceptions of bargainers in the experiments that investigate the effects of threats in bargaining, we might better understand what appear to be contradictory findings. Between-trial psychological data would provide even more information and understanding of the bargaining process. In fact, without such data, we are left to conjecture about differences in set provided by instructions and the structure of the game itself. If game research is to build cumulatively on the findings of various experiments, psychological data of the kind reported here must be collected and analyzed by all investigators.

## BIBLIOGRAPHY

- Deutsch, M. Trust and suspicion. Journal of Conflict Resolution, 1958, 2, 267-279.
- Ekman, P. Preliminary report: A study of threats within two conflict situations. Stanford, California, 1965.
- Ekman, P., Tufte, E. R., Archibald, K., and Brody, R. A. Coping with Cuba: Divergent policy preferences of state political leaders. Journal of Conflict Resolution, 1966, 10, 180-197.
- Osgood, C. E., Suci, G. T., and Tannenbaum, P. H. The measurement of meaning. Urbana: University of Illinois Press, 1957.
- Sawyer, J., and Friedell, M. The interaction screen: An operational model for experimentation on interpersonal behavior. Mimeo, University of Chicago.
- Shure, G. H., and Meeker, R. J. A personality/attitude schedule for use in experimental bargaining studies. Journal of Psychology, 1967, 65, 233-252.
- Shure, G. H., Meeker, R. J., Moore, W. H., Jr., and Kelley, H. H. Computer studies of bargaining behavior: The role of threat in bargaining. Draft document SP-2196, System Development Corporation, Santa Monica, California, 1965.
- Swirsky, L. J. Conflict and cooperation on the Conflict Board: A new mixed-motive game. Unpublished doctoral dissertation, Stanford University, 1967.



APPENDIX

Six perceptual dimensions used to measure perceptions of the adversary:

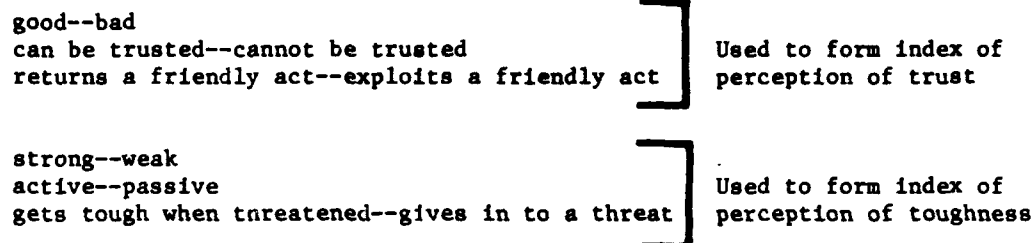


Figure 1. Semantic Differentials

Table 1

NATIONALISM, BELLIGERENCE, AND PLANS TO COOPERATE: EXPERIMENT 2

Plan	Four Groups Nationalism/Belligerence			
	Conciliatory (N=31)	Belligerent (N=15)	Conciliatory (N=16)	Belligerent (N=30)
Cooperate	24	7	9	10
Not Cooperate	7	8	7	20

Tau C = .351  
p < .01

Table 2

PERCEPTIONS OF ALTER ON TOUGHNESS INDEX BY NATIONALISM TYPE

Nationalist Type of Perceiver	[Tough]	Perceptions on toughness index					[Not Tough]
		1	2	3	4	5	
Internationalist (N=46)		15	21	5	4	1	
Nationalists (N=45)		4	8	17	11	6	

Tau C = .545  
p < .0001

Percent of Each Group  
Perceiving Alter as  
Tough

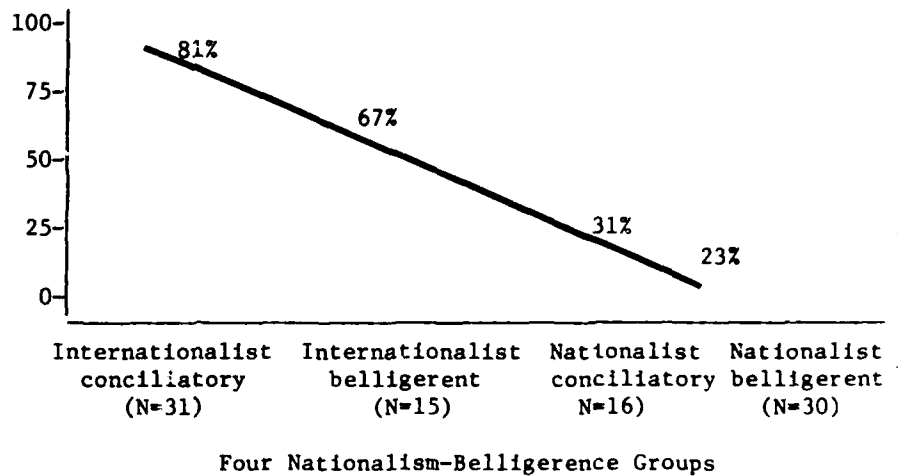


Figure 2. Nationalism, Belligerence and Perceptions of Toughness

Table 3

PLANS TO COOPERATE AND PERCEPTIONS OF ALTER:  
TOUGHNESS INDEX

Plan	[Tough]	Intervals on toughness index					[Not tough]
		1	2	3	4	5	
Cooperate		15	16	9	6	3	N=49
Not Cooperate		4	12	13	8	4	N=41

Tau C = .293  
p<.02

Table 4

PLANS TO COOPERATE AND PERCEPTIONS OF ALTER: TRUST INDEX

Plan	[Trust]	Intervals on trust index					[No trust]
		1	2	3	4	5	
Cooperate		10	23	6	7	3	N=49
Not Cooperate		4	14	7	12	4	N=41

Tau C = .265  
p<.04

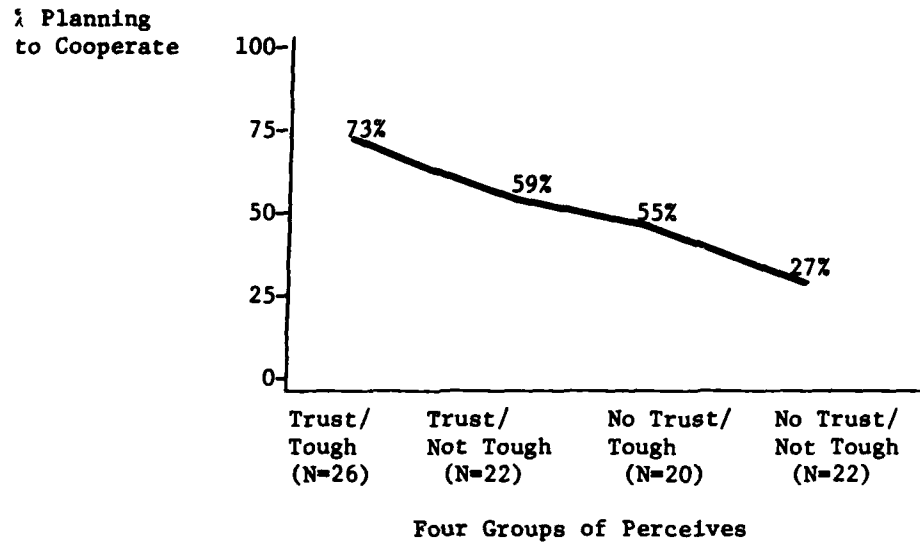


Figure 3. Perceptions on Trust and Toughness Indices and Plans to Cooperate

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