SOME PSYCHOLOGICAL ASPECTS
OF SOCIAL INTERACTION

This paper is divided into three sections. The first section outlines some theoretical notions concerning social interaction, the second discusses some critical problems in the initiation of cooperation, and the third summarizes the theoretical notions presented in this paper and comments on the role of "loose theory" in a developing science.

SOCIAL INTERACTION

I start off with the intuitive notion that a key determinant of the nature of social interactions is the way that people perceive their goals to be interrelated. I distinguish two basic ways in which the goals of people may be perceived as being linked. They may be perceived as being linked so that a gain (loss) in the amount or probability of goal attainment for one person implies a gain (loss) for the other person; the term "promotively interdependent linkage" ("co-link") is used to refer to this type of linkage. Or they may be perceived as being linked so that a gain (loss) in the amount or probability of goal attainment for one implies a loss (gain) for the other; the term "contriently interdependent linkage" (abbreviated as "contra-link") is used to refer to this type. A perceived lack of linkage is "no-link." The linkages between two people, "A" and "B," may be symmetrical or not, they may be perceived concordantly or not by the people involved, and they may be perceived vertically or not.

The degree of perceived linkage of A with B is indicated by the magnitude of the perceived correlation between the changes which occur in the amount or probability of A's goal attainment when changes occur in the amount or probability of B's goal attainment. A co-link can vary in degree from 0 to +1; a contra-link can vary in degree from 0 to -1. The strength of a linkage for an individual is the product of the degree of perceived linkage and the importance of the individual's goal which is involved in the linkage. (Importance is conceived to be a function of the
subjective utility of the goal and of the perceived difficulty of finding a satisfactory substitute for it.) When an individual is linked to another by more than one goal, the resultant linkage is determined by the sum of the strengths of the various goal linkages: the sign of the resultant indicates the type of the over-all linkage, its magnitude indicates its intensity. The ambivalence of a resultant linkage is equal to the strength of the weaker linkage type multiplied by the ratio of the strengths of the weaker to the stronger linkage type.

Although in the preceding paragraphs I have indicated that linkages of either type are not necessarily all-or-none and that the relationship may be asymmetrical and may be perceived discordantly, I shall limit myself in this paper to the consideration of the pure cases of complete promotive and contrient interdependence which are symmetrical and which are perceived consonantly. I employ the term “cooperative situation” to refer to situations in which individuals mutually and concordantly perceive their symmetrical co-linkages; the term “competitive situation” is analogously applied to situations involving contra-linkages. Figure 27-1 illustrates a case of complete symmetrical co-linkage; concordant perception implies that the relationship is perceived by both persons (P₁ and P₂) to be promotively interdependent. Figure 27-2 illustrates the case of complete, symmetrical contra-linkage. Figure 27-3 illustrates the case of non-interdependence or no-link between the goals of P₁ and P₂.

It may be noted that few real life situations correspond to our definitions of a complete or pure cooperative or competitive situation. Most situations of everyday life involve a complex set of goals and subgoals. Consequently, it is possible for individuals to be promotively interdependent with respect to one goal and contriently interdependent with respect to another. Members of a basketball team may be cooperatively interrelated with respect to win-
Figure 27-2. Pure centripet interdependence.

Figure 27-3. Noninterdependence. Each matrix depicts the relationship between the probabilities of goal attainment of two people, $P_1$ and $P_2$. $G_1$ = goal attainment; $G_a$ = lack of goal attainment. $p$, $p_1$, $p_2$ refer to probabilities and are conceived to be some function of $B_1$, the behavior of $P_1$; $B_2$, the behavior of $P_2$; and $E$, events outside the control of $P_1$ and $P_2$. 

\[
p = f(B_1, B_2, E)
\]

\[
p_1 = f_1(B_1, B_2, E)
\]

\[
p_2 = f_2(B_1, B_2, E)
\]
For the purpose of stating hypotheses about the direction and strength of behavior tendencies which result from the two basic types of goal linkages, it is necessary to make some assumptions. First of all, to simplify matters, I shall assume that we are dealing with self-contained systems in which the perceptions of individuals involved in the situation are largely veridical to the situation and to the events which occur in it. Thus, my discussion is of idealized situations which do not have the perturbations and complexities of cooperative and competitive situations found in everyday life. Secondly, I shall assume that the probability and intensity of promotive or contrent behavior upon the part of “A” in relation to “B” is, at any given time, a positive function of: (1) the strength of A’s linkage to B; (2) the increase in the likelihood of attaining his goal that A believes would result from engaging in such behavior; (3) his perceived likelihood of goal attainment if he engages in such behavior; (4) the perceived intrinsic attractiveness and lack of cost of the behavior; and (5) the perceived immediacy of goal attainment if he engages in such behavior.

From the assumptions in the preceding paragraph, it is apparent that such factors as goal importance, perceived power to affect one’s chances of goal attainment and the like, will be important determinants of behavior in the cooperative and competitive situations. Moreover, differences in goal importance, in perceived power, etc., among the individuals in a given situation will have important consequences. However, let us assume initially that the participants in the situation have approximately equal power and equally important goals involved and let us consider the effects of the two different types of goal interdependence.

**Effects of Cooperation and Competition among Equals** From the definition of mutually perceived promotive interdependence, it follows that when any individual behaves in such a way as to increase his chances of goal attainment, he increases the chances that the others (with whom he is co-linked) will also attain their goals. In the case of complete co-linkage between the goals of P1 and P2, the co-linked goals may be thought of as the common goal of both since the attainment of both goals is a necessary condition for the attainment of either of the individual goals. Several psychological consequences may be expected to follow from the perception of this state of affairs, (see Deutsch, 1949a, for an elaboration of the rationale underlying these expectations):

**Substitutability**. If P1 has moved toward his goal as a consequence of P2’s actions, there is no longer any necessity for P1 to perform any action which is functionally identical to P2’s: P2’s actions are substitutable for similarly intended actions by P1 and repetition would be perceived as superfluous. Here, of course, I assume that P1 has no intrinsic desire to perform the superfluous action and that performing it would involve some cost or delay other actions which would expedite his goal attainment.
Positive Cathexis. If $P_1$ has moved toward his goal as a consequence of $P_2$'s actions, it seems likely that $P_1$ will cathect positively $P_2$'s actions and may generalize the cathexis to $P_2$. Here, I assume that people tend to like events and the perceived causes of events which contribute to their goal attainment.

Inducibility. If $P_2$'s actions move $P_1$ toward his goals, it may be expected that $P_1$ will facilitate $P_2$'s actions and will be receptive to $P_2$'s attempts to induce him to engage in behavior which will facilitate $P_2$'s actions. In other words, $P_1$ will be willing to contribute to the attainment of the common goal.

One may expect just the opposite of substitutability, positive cathexis, and positive inducibility if $P_1$ perceives that $P_2$'s actions are decreasing rather than increasing his chances of goal attainment. He will hinder rather than facilitate, be negatively rather than positively influenced, dislike rather than like, correct rather than be satisfied with $P_2$'s actions. In other words, one may expect radically different forms of behavior in the cooperative situation depending upon whether the actions are seen as increasing or decreasing the chances of goal attainment.

In some respects, the situation of mutually perceived competition resembles the situation of unsuccessful action in the cooperative situation, except that here $P_1$ will have his chances lessened by $P_2$'s successful actions. $P_2$'s successful actions will not be substitutable for similarly intended actions of $P_1$. $P_1$ will not cathect such actions positively, nor is he likely to be induced to facilitate such actions. On the other hand, if $P_2$'s actions are bumbling and unsuccessful, one could expect that $P_1$ would have no need to duplicate them, would be pleased by such actions, and could be induced to facilitate $P_2$'s bumblings or obstruct $P_2$'s successful actions. It should be noted that in these characterizations, we are assuming "pure" situations of promotive or contient interdependence. Real life situations mostly contain mixtures of both types. Thus, a bumbling competitor may lessen the joy of a sporting contest in which the participants are contiently interdependent with respect to victory, but promotively interdependent with regard to having a challenging contest.

I shall now turn to a consideration of some of the valuable and dysfunctional consequences of "substitutability," "positive cathexis," and "inducibility" for social life and organized collective effort.

Substitutability permits the division of labor and the development of role specialization which seem necessary to the origin and survival of social groups. Role specialization may develop from initial differences in abilities, skills, knowledge, and preferences among individuals in a cooperative situation. With experience of these differences, they may arrive at a crude matching of individual characteristics and task requirements. A poor matching presumably would be corrected because the actions of someone who was inadequate in his specialized role would not be seen as substitutable for similarly intended actions by others and, hence, there would be a
tendency to redo the actions necessary to goal attainment. In effect, someone else would be performing the activities that were initially done inadequately. Role specialization could, of course, develop accidentally or by arbitrary assignment and training; but, once it had occurred, it would be likely to generate further differences in knowledge, skills, and preferences among individuals performing different functions.

Earlier, I assumed that if an individual's actions increase the chances that others will attain their goals, his actions will be castigated positively. If we make the further assumption that an individual desires to be the object of positive cathectic, we may expect that once an individual has experienced success in a given social role, he will tend to value it and seek out occasions which will permit him to perform it. The result of this process, repeated over time, is that individuals develop predispositions to perform certain roles and they come to value the opportunities and conditions which permit them to perform their roles. Thus, the process of cooperative interaction is, in its idealized form, one in which cooperating individuals perform specialized but complementing activities which are motivated in part by values and expectations deriving from prior experiences in cooperative situations.

The molding of personality predispositions and personal goals so that they support the behavior in a given social role is, of course, a great asset in developing a stable system of cooperative interactions. However, it may also have an important dysfunctional consequence. To the extent that an individual comes to value a given role per se rather than for its contribution to the attainment of goals around which the cooperative system is based, a potentially disruptive motivational element has been introduced into the system. The development of vested interests in roles may make it difficult to restructure the activities comprising a role or to reallocate roles in the light of changing experience. This may lead to the development of centrist interdependence vis-à-vis the allocation of internal resources to the different roles. I term this type of dysfunction: the pathology of vested interest.

A cooperative system may survive the potentially disruptive influences of individual commitment to specific social roles if it exists in a relatively stable, unchanging environment. In the absence of such a benign environment, it must develop a unifying influence sufficiently strong to counteract divisive individual interests. One such unifying influence inheres in the development of a commitment to and positive valuation of the cooperative system per se. Depending upon the kind of system involved, this type of commitment is referred to as "we-feeling," "team spirit," "group identification," "company loyalty," "patriotism," and so forth.

Although the perception of cooperative interdependence may be necessary to the development of "group identification," it may not be sufficient by itself. I would suggest that, in addition, there must be the perception of
an entity which is valued in common by different individuals for its diffuse instrumentality in relation to varying goals and which can, as a consequence, induce common goals relating to the maintenance and survival of the collective entity. The perception of a cooperative system as an entity and its positive evaluation are fostered by many factors. These are probably analogous to the factors which give rise to the sense of the self as an entity in the course of individual development; for instance, the reactions of people outside the cooperative system to the system as an entity, the cognition of other cooperative systems as entities, and the like.

One might speculate that the primary social functions of leadership are concerned with creating and maintaining a sense of unity despite the existence of divisive individual interests. Presumably, then, the emergence of leadership as a function which creates and maintains an over-all sense of organized purpose and coordinated effort is made more likely by the development of specialized roles and the division of labor. As history has amply demonstrated, the thesis that individuals tend to develop vested interests in their social roles is also applicable to the roles connected with leadership functions. This, in turn, creates the potential dysfunctional consequence of a divergence between the goals of the leaders and the goals underlying the cooperative system: the pathology of self-perpetuating leadership.

Positive cathexis contributes to the development and maintenance of organized collective effort by creating new motives for participation in the system of cooperation. To the extent that individuals repeatedly experience an association between their own gratifications and the gratifications of others, they are likely to come to value one another's gratifications and, hence, a new basis for cooperation emerges. That is, when there is development of mutual positive interest in one another's welfare, each person receives vicarious pleasure from the other person's pleasure or satisfaction. Under such conditions, even if the original individual goals around which cooperation developed are attained or changed, a continuing basis for cooperative relations is created. In other words, the development of an interest in the welfare of the other provides a source of motivational stability to a cooperative system which buttresses it against the otherwise debilitating effects of changing individual goals. Thus, it may be said that, though a mutual interest in the other's welfare is not initially a condition of cooperative relations, such mutual interest may arise as a consequence of cooperation and may, then, provide a basis for continuing cooperation.

The developments of personal relations among co-operators also may have dysfunctional consequences—the pathology of favoritism. This pathology is particularly likely to have harmful consequences in situations characterized by rapid change, high mobility, or considerable complexity. In such situations, personal ties may be an impediment to change, a source of internal conflict when mobility is required, and a basis for the erosion
of universalistic rules by the obligations of the particularistic ties of a personal relationship. Thus, there is some evidence that one of the personality requirements of upward social mobility is the ability to join and to leave social groups easily—the ability to avoid or resolve a strong emotional attachment to the social groups one has to leave in order to move upward.

Inducibility provides the basis for normative control of individual behavior in the cooperative situation. An individual will be receptive to the influence attempts of others to the extent that he perceives attainment of his goals as promotively linked to theirs and/or dependent on the existence of the cooperative system per se. Normative control functions to elicit cooperative behavior aimed at facilitating the promotive behavior of others or at obstructing the actions of others that are contrient with respect both to goal attainment and to the continued existence of the system. Similarly, the individual should expect that others will be receptive to his attempts to influence them. Thus, mutual inducibility provides the psychological basis for channeling individual effort into a coordinated system of action, moving the group toward goal attainment while maintaining the viability of the cooperative system itself.

Although inducibility is necessary to effective coordinated action, it may give rise to important dysfunctional consequences. This possibility has been dramatically illustrated in the Asch-type experiments where an individual may be induced to make an incorrect judgment in order to conform with the opinion of a majority. We have elsewhere (Deutsch & Gerard, 1955) made the point that most Asch-type experiments involve little in the way of cooperation or "group" influence. However, our results indicate that when promotively interdependent goals are introduced into the Asch situation, conformity tendencies are markedly increased. In effect, inducibility may come to be valued for its own sake or as a sign of one's general cooperative orientation toward others. Under such conditions, an individual may facilitate the actions of others even when it would be more useful to obstruct them, he may agree even when it would be more appropriate to disagree. Groups which arrive at consensus and concerted action based on values which make it difficult for a minority to influence the majority are deprived of the insights which reside in individual judgment.

Effects of Cooperation and Competition on Group Process. Elsewhere (Deutsch, 1949a), I have drawn out the implications of my discussion of substitutability, cathexis, and inducibility to characterize in further detail the effects of cooperation and competition on group process. Results of experimental work (Deutsch, 1949b) have provided substantial support for this characterization. These results indicated that groups of individuals who were promotively oriented to one another, as compared with groups of indi-
Individuals who were coherently oriented to one another, showed: (1) more coordination of efforts; (2) more diversity in amount of contributions per member; (3) more subdivision of activity; (4) more achievement pressure; (5) more communication to one another; (6) more attentiveness to fellow members; (7) more mutual comprehension of communication; (8) more common appraisals of communication; (9) greater orientation and orderliness; (10) greater productivity per unit time; (11) better quality of product and discussions; (12) more friendliness during discussions; (13) more favorable evaluation of the group and its products; (14) more behavior directed toward helping the group improve its functioning; (15) greater feeling of being liked by fellow members; and (16) greater feeling of obligation and desire to win the respect of others. Other studies have replicated many of these findings (e.g., Back, 1951; Berkowitz, 1957; Gerard, 1952; Gottheil, 1955; Grossack, 1954; Levy, 1953; Mizuhara, 1952; Mizuhara and Tanai, 1952; Schachter, 1951).

In the discussion so far, I have assumed that all participants were equally motivated to attain their goals and were equally capable. These assumptions are, at best, only roughly met in real-life situations. Let us now turn our attention to some of the potential effects upon the cooperative process of differences in motivation and capability.

Effects of Differences in Motivation and Capability on the Cooperative Process. Let us consider the case where the behavior of Pi largely determines the probabilities of goal attainment and P2's behavior is largely irrelevant (or vice versa). An example of this is where a husband and wife both want to live in a given community and the chances of doing so are determined by the husband's efforts to get a job there. Here, the wife's fate is dependent upon the husband's behavior, but the husband alone can produce the outcome. Under these conditions, assuming that both are equally motivated to move to the new community, it may be expected that the power of the husband to induce behavior in the wife will be greater than his wife's power over him. This discrepancy in power will present no problem to the wife, since the husband is strongly motivated to relocate. In general, unequal power among cooperators presents no problem when those who have the most power to determine the outcome have equal or stronger motivation for goal attainment than those with lesser power (Rosenberg, 1960). However, consider a situation where the husband has the power to determine the outcome but not sufficient motivation to use his power, while the wife has little power but strong motivation. Here, one may expect the wife either to attempt to increase her husband's motivation, to increase her own power to achieve her goal, or to reduce the strength of her own motivation; one may expect the husband to attempt to reduce his power and/or decrease his wife's perception of his power. I shall not consider the strategy and tactics of influence
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attempts (see Thibaut and Kelley, 1959, Ch. 7, for a discussion of these matters).

The general principle that I wish to assert is that a stable cooperative relationship exists when there is a strong positive relationship between the amount of power an individual has to determine a group’s outcome and the strength of his motivation to achieve that outcome. Thus, if P1’s power is greater than P2’s power and his motivation is weaker, an unsettled situation exists. To bring it into balance, P2 will attempt to augment his own power, or to augment P1’s motivation, or to reduce his own motivation; and/or P1 will attempt to reduce his own power, or reduce P2’s motivation, or augment P2’s power, or augment his own motivation. If the attempts to establish a more stable relationship between power and motivation do not succeed, one would expect to find symptoms of dissatisfaction and further attempts to change.

The thesis which I have advanced in the preceding paragraphs is not unfamiliar. It has often been stated that those who control power also control the benefits to be derived from its exercise (Laski, 1935) and, of course, there is considerable statistical evidence to support the view that power and such benefits as income, prestige, educational opportunity, and the like do vary together. However, the point that I am making is somewhat more general; namely, that there is a stabilizing process in cooperative systems which functions to keep motivation and power in balance. When motivation is low and power is high in a given member, other members may attempt, for example, to increase his motivation, whereas he may attempt to decrease his power; when motivation is high and power is low, a member may attempt to increase his power, whereas the others may attempt to decrease his motivation.

Noninterdependence of Goals, Dependence with Regard to Means Figure 27-3 depicts a situation in which the probabilities of goal attainment for P1 and P2 are independent. In such a situation it is, nevertheless, possible for a number of different types of relationships to exist between P1 and P2. For example, P1’s behavior toward P2 may determine P2’s chances of attaining his goal and not have any effect on his own chances, E controlling P1’s chances. This would be a case of unilateral dependence. An illustration of this might be an assembly line in which each worker may affect the worker behind him but be affected by the one preceding him. A case of mutual dependence would be illustrated by a situation in which P1’s work determined how much P2 was paid but did not affect his own pay and, similarly, P2’s work determined P1’s pay but not his own.

The situation in which P2 is unilaterally dependent upon P1 may be thought of as an extreme case of “cooperation under conditions of differences in motivation and capability.” P2’s power is zero, P1’s power is critical; P1’s motivation is high, P1’s motivation to produce the behavior de-
sized by \( P_2 \) may be negligible. One would expect that if \( P_1 \) does produce the desired behavior, it would create in \( P_2 \) substitutability, inducibility, and positive cathexis. However, one could also expect that the perceived imbalance between power and motivation would result in stabilizing attempts on \( P_2 \)'s part to increase \( P_1 \)'s motivation to produce the desired behavior and/or to increase his own power.

It is apparent that the situation of perceived mutual dependence with regard to means is quite similar in many respects to the situation of perceived promotive goal interdependence; these similarities require no elaboration and have been demonstrated by Thomas (1957). Moreover, it is evident that, over a period of time, the situation of successful mutual dependence will turn into one of promotive interdependence, as each person comes to acquire vicarious satisfaction in the other person's goal attainment. However, there are important differences between the two types of situations. Consider the case in which \( P_1 \) is very capable and \( P_2 \) is incompetent. If they are promotively interdependent, \( P_2 \)'s incompetence may spur \( P_1 \) on to exert additional effort in the attempt to compensate for \( P_2 \)'s inadequacies; in the mutually dependent case, \( P_2 \)'s incompetence would be likely to dampen the effort \( P_1 \) would make. Also in the situation of mutual dependence, if \( P_3 \), a third person, contributes to \( P_1 \)'s goal attainment, it does not necessarily help \( P_2 \); in the situation of promotive interdependence, it does.

**CRITICAL PROBLEMS IN THE INITIATION OF COOPERATION**

Tinbergen, in his book, *Social Behaviour in Animals* (1953), in answer to the question of how does cooperation originate, asserts (p. 105): "Cooperation is ensured by a system of innate activities in the actor, and of (usually innate) responsiveness to the actor's behaviour in the reactor."

The situation for man, of course, radically different: complementing innate mechanisms do not "coerce" coordination and social cooperation. The paramount fact about human cooperation is, as Asch (1952, p. 162) has pointed out, that it is based on the human "capacity to perceive a situation that includes others and ourselves and to perceive others as referring themselves to the same situation." In contrast to bio-social forms of interaction, which are dependent on innate signal and releasing tendencies, human interaction is founded on the fact that the happenings in a social encounter can be psychologically represented in each of the participants, on the enlarged capacity of humans to take into account the joint situation of oneself and the other.

The human choice to cooperate or not, thus, frequently has as its context an awareness that cooperation with another cannot be consummated unless the other's choice is consonant and coordinated with one's own.
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The problems involved in achieving mutuality of choice do not, of course, arise in choosing an inanimate object. For example, if one chooses to eat a strawberry pie, one does not have to be chosen by it in order to eat it. Since cooperation depends on mutual and consonant choices, when an individual makes his choice to cooperate or not he is faced with three critical problems—the problem of trust, the bargaining problem, and the problem of coordination. Each are discussed below in terms of the question which it poses for the potential cooperators:

1. Can he and the others trust one another sufficiently to take the risks involved in initiating cooperation? Cooperation will not develop unless at least one person initiates it through actions which are clearly recognizable as contributing to the attainment of the mutually interdependent goals. Taking the initiative, however, may involve a cost which the individual would not be willing to bear unless he felt that the others were sufficiently trustworthy to reciprocate with further cooperative actions. Figure 27-4 illustrates the problem of trust. P₁ has to choose between rows A and B and has to announce his choice before P₂ chooses. Clearly, unless he can trust that P₂ will choose column X in response to his choice of row A, he is likely to choose row B.

\[
\begin{array}{c|cc}
 & X & Y \\
\hline
A & +9,+9 & -10,+10 \\
B & +10,-10 & -9,-9 \\
\end{array}
\]

Figure 27-4. The trust problem. This and the following matrices should be read as follows: P₁ chooses between rows A and B, P₂, between columns X and Y. P₁'s payoffs are the first numbers in the cell; P₂'s, the second.

Using the experimental game illustrated in Figure 27-4, my colleagues and I (Deutsch, 1957, 1958, 1960a, 1960b; Loomis, 1959; Solomon, 1960) have conducted a series of theoretical and experimental investigations bearing on the determinants of trusting behavior. The essential psychological feature of the game is that there is no possibility for "rational" individual behavior in it unless the conditions for mutual trust exist. If each player chooses to obtain either maximum gain or minimum loss for himself, each will lose. But it makes no sense to choose the other alternative, which could result in maximum loss, unless one can
trust the other player. If one cannot trust it is, of course, safer to choose so as to suffer minimum rather than maximum loss, but it is even better not to play the game. If one cannot avoid playing the game and if one cannot trust, there may be no reasonable alternative except to choose "the lesser of two evils" and/or attempt to develop the conditions that will permit mutual trust.

There are many social situations similar to the game, in the sense that they do not permit rational individual behavior unless the conditions for mutual trust exist. Any social situation in which an individual may enhance his own satisfactions to the disadvantage of another by not adhering to the normative expectations or "social rules" governing the situation is of this sort—e.g., buyer-seller transactions, husband-wife relationships, pedestrian-driver interactions, a crowd in a theater when there is a fire, disarmament negotiations. In any such situations, mutual trust is predicated on the existence of socialized motives (for instance, an interest in the welfare of others, a desire for social approval, a conscience), external authority, or other arrangements that will provide the participants with an incentive for adhering to the rules. Generally, if people who are willing to adhere to the rules cannot trust other participants in the situation to do so, there is little possibility for rational behavior except to attempt to develop the conditions under which mutual adherence to the rules will occur.

In such a situation, what are the conditions which lead to mutually trusting behavior? From our experimental and theoretical studies of trust I would draw the following over-all generalizations: (1) Mutual trust is most likely to occur when people are positively oriented to each other’s welfare. (2) Mutual trust can occur even under circumstances where the people involved are indifferent to each other’s welfare (i.e., neither cooperatively or competitively oriented to one another), provided that one or more of the following conditions exist: (a) There is opportunity for each person to know what the other person will do before he commits himself irreversibly to a trusting choice. (b) There is opportunity and ability to communicate fully a system for cooperation which defines mutual responsibilities and also specifies a procedure for handling violations and returning to a state of equilibrium with minimum disadvantage if a violation occurs. (c) Each person has power to influence the other person’s outcome and hence to reduce any incentive he may have to engage in untrustworthy behavior. (d) There is a third person whose relationship to the two players is such that each perceives that a loss to the other player is detrimental to his own interests vis-à-vis the third person.

2. Can he and the others resolve differences in preferences or conflicts of interests over the various cooperative agreements that might be made? This is the bargaining problem, which is illustrated in Figure 27-3. P1 would obviously prefer an agreement in which he chose row B and P2
chose column $X$; $P_2$ would obviously prefer an agreement which involved the choices of row $A$ and column $Y$; both players are clearly better off if they reach agreement than if they do not.

\[
\begin{array}{c|cc}
 & X & Y \\
\hline
A & 0,0 & +2,+4 \\
B & +4,+2 & 0,0 \\
\end{array}
\]

Figure 27-5. The bargaining problem.

The outcome of a bargaining process—whether or not agreement is reached and if so on what terms—depends, I believe, on two broad sets of factors: (1) the factors determining the relative strengths of the bargainers' respective cooperative and competitive interests and (2) the abilities, resources, and freedom the bargainers have available for the invention and communication of potential bargaining agreements which might affect the strengths of their cooperative and competitive interests.

We have recently initiated a program of research on some of the factors affecting the outcome of a bargaining process (Deutsch & Krauss, 1960; Deutsch, 1961; Deutsch & Krauss, 1962). This research has, so far, been concerned with study of some of the factors that influence the strength of the cooperative and competitive interests of the bargainers. We have employed an experimental bargaining game in which a pair of subjects are presented with a bargaining problem which requires the development of a cooperative agreement in order to maximize the amount of (imaginary) money won. Subjects undergo twenty repetitions of the same bargaining problem.

In the first of several experiments, we examined the effect of the availability of threat on our subjects' behavior. Three conditions of threat were employed: no threat (neither player could threaten the other); unilateral threat (only one player had a means of threat available); and bilateral threat (both players had a means of threat).

The results of Experiment I indicated that the difficulty in reaching an agreement, as well as the amount of money lost individually and collectively, was greatest in the bilateral threat condition and next greatest in the unilateral threat condition. Only in the no threat condition did the players make an over-all profit. In the unilateral threat condition, the player with the threat capability did better than the player without the
threat capability. However, comparing the bilateral and unilateral threat conditions, the results also indicate that when facing a player who had a threat capability one was better off not having than having the capacity to retaliate in kind.

In a second experiment, we investigated the effect of communication upon the subjects' ability to reach agreements. The same task was employed as in the previous experiment, except for the fact that subjects were permitted to talk over an intercom system. The results indicated that the communication variable had no effect on the difficulty of reaching agreements in our bargaining game, although the results of Experiment I with respect to the effects of threat were replicated. Players only infrequently availed themselves of the opportunity to communicate; on the average, players communicated on fewer than one-quarter of the trials. Communication was most frequent in the no threat condition and about equally frequent in the bilateral and unilateral threat conditions, although these differences were not statistically significant.

Because subjects in Experiment II communicated so infrequently, any conclusions based upon these results would relate to the opportunity to communicate per se. In a third experiment, we attempted to overcome this difficulty by running a treatment condition in which subjects were compelled to communicate on every trial. We call this treatment "compulsory communication" and the treatment employed in Experiment II "permissive communication." All other aspects of the experiment remained the same.

The results of Experiment III indicated that compulsory communication significantly improved performance in the unilateral threat condition, as compared to the unilateral threat condition under both permissive communication and no communication.

Our interpretation of these experimental results places emphasis on the assumption that the use of threat strengthens the competitive interests of the bargainers by introducing or enhancing the competitive struggle for self-esteem. This assumption is based upon the view that to allow oneself to be intimidated, particularly by someone who does not have the right to expect deferential behavior, is (when resistance is not seen to be suicidal or useless) to suffer a loss of social face and, hence, of self-esteem; and that the culturally defined way of maintaining self-esteem in the face of attempted intimidation is to engage in a contest for supremacy vis-à-vis the power to intimidate or, minimally, to resist intimidation.

3. Can he and the others coordinate their actions in such a way that they will mutually benefit? This is the problem of coordination. Figure 27-6 illustrates the coordination problem. $P_1$ has to choose among rows $A, B, C,$ and $D$; $P_2$ has to choose among columns $W, X, Y,$ and $Z$. If their choices are coordinated appropriately, each will profit; lack of coordination may produce mutual loss or no gain. In such a situation, $P_1$'s best course of
action depends on the action he expects $P_2$ to take, which depends in turn on $P_2$'s expectation of $P_1$'s action. Each must try to guess what the other guesses he will guess the other to guess, and so on. What permits the convergence of expectations, rather than the endless spiral of "second-guessing" the other, to occur?

$$
\begin{array}{cccc}
 & W & X & Y & Z \\
 A & +4, +4 & 0,0 & 0,0 & -4, -4 \\
 B & 0,0 & +4, +4 & -4, -4 & 0,0 \\
 C & 0,0 & -4, -4 & +4, +4 & 0,0 \\
 D & -4, -4 & 0,0 & 0,0 & +4, +4 \\
\end{array}
$$

Figure 27-6. The coordination problem.

Communication is an obvious way of solving the coordination problem—for example, $P_1$ says to $P_2$: "You choose column $W$ and I'll choose row $A$." However, there are many situations in which communication is impossible or too costly and coordination has to be accomplished tacitly rather than explicitly. Moreover, even when communication is feasible, there is often some necessity for selecting what one communicates from that limited range of possibilities which are likely to be mutually acceptable. Thus, Schelling (1960, p. 70) has pointed out:

> Most bargaining situations ultimately involve some range of possible outcomes within which each party would rather make a concession than fail to reach agreement at all. . . . The final outcome must be a point from which neither expects the other to retreat; yet the main ingredient of this expectation is what one thinks the other expects the first to expect, and so on. . . . These infinitely reflexive expectations must somehow converge on a single point, at which each expects the other not to expect to be expected to retreat.

Schelling (1960, Ch. 3), in a very interesting series of pilot experiments, has demonstrated that it is possible for people to converge their expectations and coordinate their actions even though they have no opportunity to communicate. This was true in situations where the interests of the subjects were purely cooperative (as, "Name 'heads' or 'tails.' If you and your
partner name the same, you both win a prize.”) and also true in situations which involve tacit bargaining (as, “You and your partner are to be given $100 if you can agree on how to divide it without communicating. Each of you is to write the amount of his claim on a sheet of paper, and if the two claims add up to no more than $100, each gets exactly what he claimed. If the two claims exceed $100, neither of you gets anything. How much do you claim?”).

Schelling (1960, p. 70) advances the proposition that certain alternatives serve as focal points around which expectations converge because they enjoy “prominence, uniqueness, simplicity, precedent, or some rationale that makes them qualitatively differentiable from the continuum of possible alternatives.” The existence of qualitatively distinct focal points permits tacit coordination in the situation of pure coordination and gives certain outcomes a greater intrinsic magnetism in bargaining situations. Unfortunately, there has been little adequate theorizing or research on the determinants of the convergence of expectations or in the perception of focal points. I suspect that the research by Gestalt psychologists on the determinants of figure-ground relations in perception and by social psychologists on acculturation processes may provide the best leads for understanding the processes leading to the convergence of expectations in situations of tacit coordination.

SUMMARY AND COMMENT

In the first two sections of this paper, I have attempted to develop the notion that an important determinant of social behavior is the way in which the goals of interacting individuals are related. Three fundamental properties of social interaction have been focused upon: substitutability (i.e., the readiness to accept another person’s actions as substitutes for one’s own); cathexis (i.e., the tendency to develop positive or negative sentiments toward another); inducibility (i.e., the tendency to accept or reject the other’s influence attempts). The extent to which one individual’s behavior improves or worsens another’s chances of goal attainment will determine the direction of the effect of these three mediating variables. The likelihood that A’s behavior will improve B’s chances is, I have pointed out, determined by the type of linkage between B’s goal and A’s goal (cooperative or competitive) and by its effects upon A’s chances or degree of goal attainment. The magnitude of the effect of A’s behavior on B will be determined by the degree of improvement (or worsening) in B’s chances or degree of goal attainment which results from A’s behavior and the importance of B’s goal to B. I have further indicated that the extent to which A’s behavior will affect B’s chances is determined by the degree of linkage between B’s goal and A’s goal and by the expected
utility of A's behavior in relation to his goal and by A's power or capability to act in relation to his goal.

In the first section, I took as a premise that the people were objectively linked in a given type of interdependence and that they mutually and veridically perceived the nature of this interdependence. In the second section, I considered some of the problems—the problem of trust, the bargaining problem, and the coordinative problem—which may arise in the process of attempting to establish mutual cooperation. Our experimental results suggest that these problems are much easier to resolve if the potential cooperators each have a stake in the other's welfare. The development of mutual interest in one another's welfare is, in turn, fostered by the experience of successful cooperation.

An examination of the ideas presented in this paper would suggest that I have presented what might be termed a "loose theory." The ideas presented form a theory to the extent that they contain a number of concepts which are interrelated so as to lead to a variety of predictable consequences if empirical coordinations are made with the concepts. The theory is a loose one because neither the concepts, nor their interrelations, nor their empirical coordinations are precisely or unambiguously defined. In terms of the criteria for a theory often specified in books on the philosophy of science, it is admittedly a woefully deficient theory. Yet "loose theories" of this kind are rather prevalent in the social sciences. I suggest that their prevalence does not merely indicate the intellectual deficiencies of the theorists but expresses a genuine need of relatively immature sciences.

The very "looseness" of such theories has, of course, an important function. It enables the scientist to keep in contact with phenomena which common sense, experience, and personal intuition suggest are central to his discipline, but which cannot as yet be apprehended in a form sufficiently rigorous for "tight" formalization. An alternative to this, of course, is for the scientist to consciously delimit himself to those aspects of his discipline which can be rigorously apprehended. Such an approach is not without its own pitfalls. The attempt to construct a formalized theory before an appropriate logico-mathematical apparatus has been developed or before there is a rich intuitive grasp of the phenomena being investigated may distract attention from the problems indigenous to one's subject matter. It also may lead to a focus on problems which are "scientifically" tractable in the sense that they enable the investigator to be adequate to an image of science which is modeled after the relatively mature portions of physics. The functions of "theory" in "loose theory" are similar to those of any plausible system of explanation; namely, to provide a communicable framework for integrating experience and empirical research, for stimulating and guiding new research, and for generating novel insights.
which are not immediately apparent from or necessarily consistent with common sense or personal intuition.

A loose theory to be useful has to be fertile and communicable. But how can a theory which is ambiguous and imprecise achieve these objectives? It would be valuable indeed if students of science turned their attention to this question because there is little doubt that various “loose” theories (such as psychoanalytic theory, G. H. Mead’s symbolic interactionism theory, Durkheim’s theory of anomie) have been both fertile and communicable.

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