

A THEORY OF CO-OPERATION AND COMPETITION¹

MORTON DEUTSCH

The concept of "co-operation" and the interrelated concept of "competition" are rarely missing in discussions of inter-personal or inter-group relations: implicitly they play a key role in the writings of many social theorists. Yet despite the obvious significance of these concepts for the understanding and control of social process,² there has been little in the way of explicit theorizing and virtually no experimental work with respect to the effects of co-operation and competition upon social process. The work in this area has largely been concerned with the effects of the individual's motivation to achieve under the two different conditions. None of the experimental studies has investigated the interactions between individuals, the group process that emerges as a consequence of the co-operative or competitive social situation.

The purpose of this article is to sketch out a theory of the effect of co-operation and competition upon small (face-to-face) group functioning.

A subsequent article will present the results of an experimental study of such effects. Before attempting the theoretical development, the definitions and formulations of "co-operation" and "competition" made by other writers will be briefly surveyed (Section A). Immediately following this glance at the literature, the basic concepts in the theory of co-operation and competition to be offered here will be presented (Section B). The next step will be to draw some of the implications logically inherent in the basic concepts. Then, with the aid of some additional psychological assumptions, some of the psychological implications inherent in the co-operative and competitive social situations will be deduced. Hypotheses will then be developed with respect to the effects of co-operation and competition upon group process by applying these psychological implications to group situations. The last section of the paper (Section C) will develop some group concepts and show the intimate relationship between the concepts,

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² Thus Elton Mayo (see Reference 16) has written, "It is not the atomic bomb that will destroy civilization. But civilized society can destroy itself—finally, no doubt, with bombs—if it fails to understand and to control intelligently the aids and deterrents to co-operation."

"group" and "co-operative social situation." This intimate relationship, it will be demonstrated, provides the possibility for translating the hypotheses with respect to the effects of co-opera-

tion and competition upon group process into hypotheses about the effects of quantitative variations in group-conceptualized variables upon group process.

SECTION A

Some Existing Formulations—A Glance at the Literature

No attempt will be made to summarize the extensive writings on co-operation and competition. May and Doob (15) have done this for the literature up until 1937; only a few studies of significance have been reported since then. In addition to indicating the prominence of the concepts of competition and co-operation in social and economic theory, May and Doob have developed an elaborate theory. They distinguish between co-operation and competition in the following manner:

"Competition or co-operation is directed toward the same social end by at least two individuals. In competition, moreover, the end sought can be achieved in equal amounts by some and not by all of the individuals thus behaving; whereas in co-operation it can be achieved by all or almost all of the individuals concerned" (15, p. 6).

Their theory primarily has to do with the conditions for, and the forms of, co-operation and competition. Their basic postulates with respect to co-operation and competition are as follows:

Postulate 5. On a social level individuals compete with one another when: (a) they are striving to achieve the same goal which is scarce; (b) they are prevented by the rules of the situation from achieving this goal in equal amounts; (c) they perform better when the goal can be achieved in unequal amounts; and (d) they have relatively few psychologically affiliative contacts with one another.

Postulate 6. On a social level individuals co-operate with one another when: (a) they

are striving to achieve the same or complimentary goals that can be shared; (b) they are required by the rules of the situation to achieve this goal in nearly equal amounts; (c) they perform better when the goal can be achieved in equal amounts; and (d) they have relatively many psychological affiliative contacts with one another" (15, p. 17).

Mead's survey of co-operation and competition among primitive peoples (18) accepted the following definitions:

"Competition: the act of seeking or endeavoring to gain what another is endeavoring to gain at the same time.

Co-operation: the act of working together to one end" (18, p. 8).

She asserts that a distinction must be made between "competition" and "rivalry." A similar distinction is made between "co-operation" and "helpfulness."

"Competition is behavior oriented toward a goal in which the other competitors for the goal are secondary; rivalry is behavior oriented toward another human being, whose worsening is the primary goal.

In co-operation, the goal is shared and it is the relationship to the goal which hold the co-operating individuals together; in helpfulness, the goal is shared only through the relationship of the helpers to the individuals whose goal it actually is" (18, p. 17).

Maller in his classic study of co-operation and competition among school children (14) defined a co-operative situation as one which stimulates an individual to strive with the other members of his group for a goal object which is to be shared equally among all of them. On the other hand, a competitive situation is one which stimulates the individual to

strive against other individuals in his group for a goal object of which he hopes to be the sole or principal possessor.

Barnard (1) has done extensive theorizing on the nature of co-operative systems. He discusses the origin of co-operative action:

"Among the most important limiting factors in the situation of each individual are his own biological limitations. The most effective method of overcoming these limitations has been that of co-operation. This requires the adoption of group, or non-personal purpose.

He also discusses factors that emerge from co-operation.

Co-operation is a social aspect of the total situation and social factors arise from it. These factors may be in turn the limiting factors of any situation. This arises from two considerations: (a) the processes of interaction must be discovered or invented; (b) the interaction changes the motives and interest of those participating in the co-operation.

Also considered are the persistence and survival of co-operation:

The persistence of co-operation depends upon two conditions: (a) its effectiveness; and (b) its efficiency. Effectiveness relates to the accomplishments of the social purpose. Efficiency relates to the satisfaction of individual motives. The test of effectiveness is the accomplishment of a common purpose. The test of efficiency is the eliciting of sufficient individual wills to co-operate.

The survival of co-operation, therefore, depends upon two interrelated and interdependent classes of processes: (a) those which relate to the system of co-operation as a whole in relation to the environment; and (b) those which relate to the creation or distribution of satisfactions among individuals" (1, pp. 60—61).

Helen Block Lewis in two recent articles (9, 10) has presented a very

stimulating viewpoint. She writes:

"A minimum requirement for co-operative behavior is not physical togetherness nor joint action, nor even synchronous, complementary behavior, but a diminution of ego-demands so that the requirements of the objective situation and of the other person may function freely. In truly co-operative work, personal needs can function only if they are relevant to the objective situation; the common objective, in other words, is more important than any personal objective. . . . Since the self is not focal, another person's activities—the co-operating person's—may be as satisfactory as your own.

Competing for individual rewards, i.e., individualistic competition, on the other hand, involves a heightening of ego-demands, so that the ego-objective is more important than any common objective; i.e., the person is at the focus of consciousness, self-consciousness is at a maximum—the individual is "on the spot"—so that similar behavior may be expected from the member of the competing group and the person driven by inordinate (neurotic) ambition. Competing behavior involves seeing the objective situation as relevant to the personal need to win, or for prestige. Only personal activities, therefore, can be satisfactory" (9, pp. 115—116).

This rather brief survey and a cursory glance through the works of various social theorists (5, 12, 13, 22, 24) has indicated a core of common conceptualizations running through the treatment of the co-operative and competitive social situation. Implicit in most of these conceptualizations has been the notion that the crux of the difference between co-operation and competition lies in the difference in the nature of the goal-regions in the two social situations. The conceptualization to be offered below also follows this distinction.

SECTION B

A Conceptualization of the Co-operative and Competitive Situations with a Development of Some of its Logical and Psychological Implications

1. In a *co-operative social situation* the goals for the individuals or sub-units in the situation under consideration have the following characteristic: the

goal regions for each of the individuals or sub-units in the situation are defined so that a goal-region can be entered (to some degree) by any given individual or sub-unit only if all the individuals or sub-units under consideration can also enter their respective goal-regions (to some degree). For convenience sake, the phrase "promotively interdependent goals" will be used to identify any situation in which the individuals or sub-units composing it have their goals interrelated by the characteristic defined above³.

2. In a *competitive social situation* the goals for the individuals or sub-units in the situation under consideration have the following characteristic: the goal-regions for each of the individuals or sub-units in the situation are defined so that if a goal-region is entered by any individual or sub-unit, (or by any given portion of the individuals or sub-units under consideration) the other individuals or sub-units will, to some degree, be unable to reach their respective goals in the social situation under consideration. For convenience sake, the phrase "contriently interdependent goals" will be used to identify any situation in which the individuals or sub-units composing it have their goals interrelated by the characteristic defined immediately above.

It should, perhaps, be noted that there are probably very few, if any, real-life situations which, according to the definitions offered above, are "purely" co-operative or competitive. Most

situations of everyday life involve a complex set of goals and sub-goals. Consequently, it is possible for individuals to be promotively interdependent with respect to one goal and contriently interdependent with respect to another goal. Thus, for example, the members of a basketball team may be co-operatively interrelated with respect to winning the game, but competitively interrelated with respect to being the "star" of the team.

It is also rather common for people to be promotively interdependent with respect to sub-goals and contriently interdependent with respect to goals or vice versa.⁴ For instance, advertising concerns representing different cigarette companies may be co-operatively interrelated with respect to the sub-goal of increasing the general consumption of cigarettes but competitively interrelated with respect to the goal of increasing both the relative and absolute sales of a specific brand of cigarette. Two professional tennis players with the promotively interdependent goals of earning a lot of money by putting on matches which will draw large crowds, may, under certain circumstances, be contriently interdependent with respect to winning each match.

No attempt will be made in this article to describe and analyze further the wide variety of "impure" co-operative and competitive situations which are found in everyday life. The theoretical development to be presented here will be primarily concerned with

³ It is important to note that the definitions offered here for both the co-operative and competitive social situations are such that it is possible, from the point of view of an objective social observer (i.e.—the social scientist), for an individual to be promotively or contriently interdependent with other individuals without that individual in any sense being aware of, or psychologically affected by, this interdependence.

⁴ The distinction that is being made here between "goals" and "sub-goals" is similar to the commonly made distinction between "means" and "ends." A "means" or "sub-goal" can be defined as being a psychological unit on the path to the goal and, as such, it possess goal-like properties either as a consequence of expectations built up in the course of its previous associations with the goal or as a consequence of its currently perceived importance in obtaining the goal.

"pure" co-operative and competitive situations. However, it is believed that in many circumstances not much theoretical extrapolation is necessary to handle the more complex situations.

The conceptualizations of co-operation and competition offered in this paper, if they are adequate, combined with the definition of the group concept, "membership motive" (see Section C), provide an opportunity for the derivation and empirical testing of hypotheses about the effect of variations in strength of membership motive on various aspects of group functioning. This possibility is created primarily by the linkage of "co-operation" and "membership motive" through the concept "promotively interdependent goals." The empirical linkage is provided by the operational definitions of co-operation and competition that compose the experimental manipulation.

Specifically, the hypotheses relevant

to group functioning must be derived from the consequences inherent in the concepts "promotively interdependent goals" and "contriiently interdependent goals." In some respects the word "derivation" is being used rather loosely in this study. The "derivations," insofar as they result in hypotheses that can be empirically tested, require additional psychological assumptions. These assumptions will be stated when recognized and when feasible.

As a first step in the attempt to derive hypotheses, an attempt will be made to state the implications logically inherent in the aforementioned concepts. The second step will be to attempt to deduce psychological implications, making various psychological assumptions, from the logical implications of the concepts. The third step will be to attempt to apply these psychological implications to problems of group functioning.

Step I: The Logical Implications of the Conceptualization of the Co-operative and Competitive Social Situations.

Promotively Interdependent Goals

If A, B, C, etc., does not obtain his goal (enter his goal region), X does not obtain his goal.

X obtains his goal only if A, B, C, etc., obtain theirs.

A, B, C, etc., obtain their goals only if X obtains his.

Contriiently Interdependent Goals

If A, B, or C, obtains his goal, Y does not obtain his goal.

Y obtains his goal only if A, B, C, etc., do not obtain theirs.

A, B, C, etc., do not obtain their goals if Y obtains his.

From the definitions of promotively and contriiently interdependent goals, it appears to follow that: (a) Any person X who has promotively interdependent goals with persons A, B, C,

etc., will come to have promotively interdependent locomotions in the direction of his goal⁵ with persons A, B, C, etc.; (b) any person Y who has contriiently interdependent goals with

⁵ It should be emphasized that, at this point in the development, "locomotion in the direction of the goal" refers to locomotion in an objective social space, not to locomotion in the individual's life space. That is, as yet, no inference should be drawn as to whether the individual is aware of, or even affected by, his locomotion in objective social space. An example of locomotion in objective social space without immediate corresponding locomotion in the individual's life space, is the following: A student takes an exam., thinks he fails, and is afraid he will not graduate. The instructor corrects the exam., passes the student, the student is approved for graduation,

persons A, B, C, etc., will come to have contritly interdependent locomotions in the direction of his goal with persons A, B, C, etc.

The above statements are based on the following considerations: Locomotion in the direction of the goal, from any point not in the goal region, may be thought of as a condition for entry into the goal region. Entry into the goal region may be thought of as a part of locomotion in the direction of

the goal; entry being the final step in locomotion. It follows that a locomotion by X or Y in the direction of his goal can be considered to be promotively or contritly interdependent with the locomotions of A, B, C, etc. in the direction of their goals; the nature of the interdependence with respect to locomotions depending upon the nature of the interdependence with respect to goal regions.

Promotively Interdependent Locomotions in the Direction of the Goal

If A, B, or C, etc., does not locomote in the direction of his goal, X does not locomote in the direction of his goal.

If X locomotes in the direction of his goal, A, B, C, etc., will locomote in the direction of their goals.

If A, B, or C, etc., locomotes in the direction of his goal, X will locomote in the direction of his goal.

In addition to the above implications of statements 1 and 1a⁶, it seems to be possible to draw implications concerning locomotion which is in a direction away from the goal.⁷

From the statements about promotively and contritly interdependent locomotions it seems to be possible to draw further implications, if we accept the following additional statements:

Contritly Interdependent Locomotions in the Direction of the Goal

If A, B, or C, etc., locomotes in the direction of his goal when Y is not locomoting in the direction of his goal (or locomotes at a more rapid rate than Y locomotes towards his goal), the rivalry ratio:—

$$\left(\frac{\text{Locomoting Person's Distance to his Goal}}{\text{Person Y's Distance to his Goal}} \right) \text{ will decrease}$$

If Y locomotes in the direction of his goal, when A, B, or C, etc., is not locomoting in the direction of his goal (or locomotes at a more rapid rate than A, B, or C, etc., is locomoting toward his goal) the rivalry ratio described above will increase.

If A, B, or C, etc., does not locomote in the direction of his goal and Y does not locomote, the rivalry ratio will either remain constant or increase.

1. Facilitating locomotion (i.e.—decreasing resistances to locomotion) in the direction of the goal makes it more likely that the goal will be obtained.
2. Hindering locomotion (i.e.—increasing resistances to locomotion) in the direction of the goal makes it less likely that the goal will be obtained.

etc., within a day after the student takes the exam. The student is not notified that he has passed; he worries, anticipates failure, and (to carry the example to its extreme) commits suicide. Objectively, socially, he has locomoted past the barrier of the exam., psychologically he has not. Being unaware of his objective social locomotion, his psychological position in relation to his goal is unaffected by his objective locomotion. As a consequence, he behaves as though still confronted by the barrier.

⁶ See below, p. 138.

⁷ For the definition of the direction “away from” see Lewin’s monograph (7) “The Conceptual Representation and Measurement of Psychological Forces.”

Promotively Interdependent Locomotions in a Direction away from the Goal

If A, B, or C, etc., does not locomote in a direction away from his goal, X does not locomote in a direction away from his goal.

If X locomotes in a direction away from his goal, A, B, or C, etc., will locomote in a direction away from their goals.

If A, B, or C, etc., locomotes in a direction away from his goal, X will locomote in a direction away from his goal.

Promotively Interdependent

If X facilitates the locomotion of A, B, or C, etc., in the direction of their goals, he facilitates his own locomotion in the direction of his goal.

If A, B, or C, etc., facilitate the locomotion of X toward his goal, their locomotion will be facilitated.

If X hinders the locomotion of A, B, or C, etc., toward their goals, he will hinder his own locomotion.

If A, B, or C, etc., hinder the locomotion of X, the locomotion of A, B, or C, etc., will be hindered.

Several major differences reveal themselves as inherent in the distinctions between the co-operative and competitive social situations. The analysis of the co-operative situation reveals that all the individuals in such a setting occupy the same relative positions with respect to their goals; if any one individual locomotes, the others must also locomote in the same direction. In the competitive situation, the various individuals may occupy the same or differing positions with respect to their goals; locomotion by any individual has no necessary effect on the locomotions of others, though it may affect the relative positions of the various individuals.

Contritently Interdependent Locomotion in a Direction away from the Goal

If A, B, or C, etc., locomotes in a direction away from his goal when Y is not locomoting in a direction away from his goal (or locomotes at a more rapid rate than Y does in such a direction), the rivalry ratio:—

$$\left(\frac{\text{Locomoting Person's Distance to his Goal}}{\text{Person Y's distance to his Goal will increase}} \right)$$

If Y locomotes in a direction away from his goal, when A, B, C, etc., is not locomoting in a direction away from his goal (or locomotes at a more rapid rate than A, B, or C, etc., in such a direction), the rivalry ratio will decrease.

If A, B, or C, etc., does not locomote in a direction away from his goal and Y does not locomote, the rivalry ratio will either remain constant or decrease.

Contritently Interdependent

If Y facilitates the locomotion of A, B, or C, etc., in the direction of their goals, the rivalry ratio is likely to decrease.

If A, B, or C, etc., facilitates the locomotion of Y towards his goal, Y's rivalry ratio is likely to increase.

If Y hinders the locomotion of A, B, or C, etc., toward their goals, he will be likely to increase his own rivalry ratio.

If A, B, or C, etc., hinder the locomotion of Y towards his goal, Y's rivalry ratio is likely to decrease.

Step II: The Deduction of Psychological Implications from the Conceptualizations of the Co-operative and Competitive Situations

Up to this point we have been stating some of the consequences logically inherent in the conceptualizations of simple co-operative and competitive social situations. No statements have been made which have a direct psychological reference (i.e.—a reference in terms of individual life spaces). The statements have had reference only to an objectively defined social space.

The next step called for appears to be an attempt to derive psychological implications from these statements by introducing additional psychological

assumptions which will somehow relate these statements about events in objective social space to events in individual life spaces. In the attempt to take this next step, many of the theoretical issues that are involved in the relationship of "objective facts" to "psychological facts" will be ignored. It is felt that it would be over-ambitious to try to deal with these issues in the scope of this article.

The problem to be solved in taking this next step is quite a difficult one. Essentially the question of "What psychological assumptions are necessary in order to derive psychological or perceived interdependence⁸ from objective social interdependence?" or "Under what circumstances will individuals who, objectively, are in a co-operative or competitive social situation come to perceive that they are co-operatively or competitively inter-related with the others?"⁹

It is evident that the problem being raised here is in certain respects similar to the question Koffka raises of "Why do things look as they do?" Koffka, dealing with problems of the perception of physical objects, clearly points out the inadequacies of any answers solely in terms of the real properties of the objects or even in terms of the proximal stimulus properties of the object. Yet even so, for effective behavioral adjustment to its environment, an organism's perceptions and expectancies must be veridical to the

entities and the relationships among those entities that compose its functional environment. To explain the behavioral adequacy of our perceptions, expectations, or cognitions one might say that the same kinds of laws govern both the organization of real entities and the organization of the perceptual field. Such an explanation could perhaps be accepted for the simpler perceptions, perceptions in which object-Ego relations do not influence the organization of the perceptual field (though even in the simpler cases there appear to be many exceptions to such an explanation). However, it is likely that all social perceptions and expectations involve Ego-forces in their organization. Thus, the explanation of the behavioral adequacy or inadequacies of our social perceptions and expectations requires an insight into the nature of object-Ego relationships and an understanding of how these relationships are acquired.

Without in any way attempting to detail an explanation of the reasons for the behavioral adequacy or inadequacy of our perceptions and expectations, it becomes apparent that learning principles, as well as principles of perceptual and cognitive organization, are basic to the explanation. Learning principles are necessary to bridge the gap between objects and relations, and percepts and expectations. (They are necessary but not efficient. It is clear that principles of cognitive organization, such as

⁸ The phrase "psychological or perceived interdependence" is not meant to be limited in meaning to only those psychological events which are "conscious," "verbalizable," or "mediated by a process of awareness."

⁹ Another approach to the problem of the interrelationship between objective social interdependence and perceived social interdependence would be to postulate that psychological or perceived interdependence is a necessary condition for objective social interdependence. It seems apparent that such an approach would by-pass the problem and in by-passing the problem would ignore facts that indicate that an individual can locomote through an objective social space without, in any sense, being immediately aware that locomotion is taking place. Further, such an approach, by definition, would not be able to analyze why under varying social conditions there would be little or much psychological unity in groups that have the same objective social interdependence.

revealed by the work of Heider, as well as the more obvious factors of perceptual organization, are involved). "Objective social facts," as well as "things" come to have "psychological" significance (i.e., significance in terms of the life-space) through learning. By assuming that all action is a process which is directed toward reduction or removal of need-tension, that some such principle as the "Principle of Least Action" (26) guides action, and that object significance is established in the course of action, it is possible to derive that the perceptions and expectations of an individual are likely to be veridical to his objective environment in direct proportion to the individual's capacities, to his amount of experience in the environment, and to the simplicity of the environment being perceived.

The preceding several paragraphs have been an excursus. It is hoped that this excursus has served two purposes. One purpose has been to demonstrate the very complex and shaky assumptions that exist at the base of any predictions about behavior in an objective social situation. The second purpose has been to provide the rationale for such predictions by offering an empirical co-ordination for hypotheses to be derived from the conceptualizations of the two objective social situations. In brief, the preceding sections were meant to provide the rationale for the following kind of statement: "If five reasonably well-adjusted college students, of fairly homogeneous abilities, are placed in a social situation in which they have, objectively, promotively interdependent

goals (or contritently interdependent goals) and the clues to the situation are reasonably obvious, the five students will perceive themselves as having promotively interdependent goals (or contritently interdependent goals)." The rationale for the statement is the previously stated assumption that the perceptions and expectations of an individual are likely to be veridical to his environment if he has had enough experience with the situation, if he has intelligence, and if the situation is simple enough. The subjects in the experiment to be reported in a subsequent paper were all relatively intelligent. All of them had had experience with co-operative and competitive social situations. The experimental manipulations defining the two situations were simple and explicit.

The same psychology can be applied to promotively (and contritently) interdependent locomotions and to promotively (and contritently) interdependent facilitations and hinderings so as to derive psychological or "perceived" interdependence from the objective social interdependence. However, it should be pointed out that in the experimental situation the tasks that the individuals were exposed to were of such a nature that the clues provided by objective locomotion were neither simple nor clear-cut. Thus, it can be assumed that the correspondence between objective and psychological locomotion was far from perfect. This lack of correspondence has, of course, its empirical consequences which one should be able to predict from theoretical considerations.¹⁰ Fortunately, for

¹⁰In large measure, one should be able to explain the differences of behavior (individual or group) that occur in objective social situations as being due to lack of correspondence between the "perceived" and "objective" situation. Moreover, knowledge of the explicitness of cues provided by a given co-operative (or competitive) social situation should enable us "to predict" differences in kind and amount of co-operative (or competitive) behavior.

An individual is not "co-operative" even though objectively he stands in a co-operative relation

the present purposes, the lack of perfect correspondence between "objective" and "perceived" interdependence can

be disregarded since the hypotheses to be offered in the next pages are relative rather than quantitatively refined.

BASIC HYPOTHESES

Hypothesis 1.

(a) Individuals who are exposed to the co-operative social situation (*Indiv co-op*) will perceive themselves to be more promotively interdependent (in relation to the other individuals composing their group) with respect to goal, locomotions, facilitations, etc., than will individuals who are exposed to the competitive social situation (*Indiv comp*).

(b) *Indiv comp* will perceive themselves to be more contritely interdependent (in relation to the other individuals composing their group) with respect to goal, locomotions, facilitations, etc., than will *Indiv co-op*.

For convenience sake, let us direct our attention to the psychological implications of locomotion in the co-operative or competitive situation. Let us analyze the following hypothetical instance with respect to locomotion in the direction of the goal: "A" locomotes in the direction of his goal and the other individuals in the social situation perceive that "A" is locomoting:

1. *In the co-operative situation* "X" would (be likely to) perceive that he has locomoted towards his goal as a consequence of "A's" actions. Several implications seem directly to follow, if

we accept certain additional psychological assumptions:

(a) *Substitutability*—Since "X" has locomoted towards his goal as a consequence of "A's" actions, there is no longer any necessity for "X" to perform any action which is similar (functionally identical) to "A's". We can derive that "A's" action will be substitutable for "X's," if we assume any one of the following: a principle of "Least Action," a principle of "Efficiency," or that the force in a direction of a region is zero when the person is in that region.

(b) *Positive Cathexis*—If we make an assumption, which is rather widely accepted, that an entity will acquire positive valence or cathexis (become attractive) if that entity is seen to be promotively related to need satisfaction—it is possible to derive that "A's" action (which results in locomotion in the direction of the goal) will be positively cathected by "X." That is, "X" is likely to accept, like, or reward "A's" action.

(c) *Inducibility*—The assumption here is a little more complex: Let us assume that the relationship of inducibility derives from the fact that the inducible person perceives the inducing entity

to others, when he does not perceive this relationship. From this lack of correspondence, without too many additional psychological assumptions, one should be able to predict the following: how an individual will diverge from "co-operative" behavior; what happens when the "divergent" individual bumps up against the objective situation; and the effect of his divergence on others who are in a "co-operative" situation with him. The kind of prediction that would be made is the same order of prediction that one would make about a rat's behavior, knowing how much the rat's percept and expectations with respect to the maze he has to run diverge from the objective structure of the maze.

to be such that it stands in a causative relationship to the intensification, continued persistence, or lowering of need tension within himself. Positive inducibility¹¹ occurs when the inducing entity is seen to be promotive rather than contrient with respect to tension-reduction (or when the inducing entity is seen as more powerful—i.e., capable of producing even more tension than the tension existing to be reduced).

Making the above assumption, one can derive that "X" will stand in the relationship of positive inducibility to "A" insofar as "A's" action contributes towards "X's" locomotion in the direction of his goal.

2. *In the competitive situation* "Y" would (be likely to) perceive that his rivalry ratio with respect to "A" has decreased. The situation here is somewhat more complex than in co-operation. The amount of change in the rivalry ratio would depend upon the distances of both "A" and "Y" from their goals and also upon the distance locomoted by "A." Nevertheless several implications seem directly to follow, if we accept certain additional psychological assumptions (though, it may be that if the rivalry ratio is greater than a certain maximum, or lower than a certain minimum, a rivalry situation will no longer exist psychologically).

(a) *Substitutability*—It is evident that there will be no substitutability.

(b) *Negative Cathexis*—The assumption here is parallel to that made in deriving positive cathexis; an entity will acquire negative cathexis if that entity is seen to be contriently related to need satisfaction (therefore, is seen to decrease the probability of need

satisfaction). The additional assumption here is that decreasing the rivalry ratio will be seen as decreasing the probability of success. (This additional assumption may only hold within minimum and maximum limits). From these assumptions it is possible to derive that "A's" locomotions in the direction of his goal will be negatively cathected by "Y."

(c) *Negative Inducibility*¹²—Assuming that negative inducibility occurs when the inducing entity is seen as contrient with respect to tension reduction, one can derive that "Y" will stand in the relationship of negative inducibility to "A" insofar as "A's" actions lead to locomotions by "A" which decrease "Y's" probability of reaching his goal. However, another factor, cognitive in nature, may come into play making "Y's" relation to B one of ambivalence or non-inducibility—the cognition that "going in a direction opposite to or away from "A's" would be going in an opposite direction to or away from his own goal.

We can, with the same kinds of assumption, analyze a hypothetical instance in which "B" locomotes in a direction away from his goal. Without detailing the analysis, it is evident that in the co-operative situation, substitutability is not expected, but one would expect negative cathexis and negative inducibility. The competitive situation, again, is not so unequivocal as the co-operative situation. Here one would expect positive cathexis and ambivalent inducibility or non-inducibility.

Facilitations and Hinderings—One can make the same derivations that were

¹¹ Positive inducibility is meant to include two related phenomena: (a) The production of additional "own" forces in the direction induced by the inducing entity. (b) The channelizing of existing "own" forces in the direction induced by the inducing entity.

¹² Negative inducibility is meant to include two related phenomena: (a) the production of additional "own" forces; (b) channelizing of existing "own" forces in the direction opposite to that desired by the inducer.

made with respect to substitutability, cathexis, and inducibility for facilitations and hinderings, respectively, as those that were made for locomotions in the direction towards or away from the goal. Thus, it is possible to make statements about "helpfulness" and "obstructiveness"—defining "helpfulness" as the act of facilitating locomotion, and defining "obstructiveness" as the act of hindering locomotion.

In the *co-operative situation*, if "X" facilitates the locomotion of "A" in the direction of his goal, he also facilitates his own locomotion in the direction of this goal. Assuming that facilitation of locomotion makes locomotion more probable, it is evident that "X's" facilitations of others are likely to result in his own locomotion, and therefore, is also likely to result in tension-reduction with respect to that locomotion. His own actions of facilitation (*helpfulness*) will become positively cathected and will be likely to be manifested in appropriate situations (according to learning theory previously assumed). Using the same kind of analysis one can demonstrate that acts hindering locomotion in the direction of the goal (*obstructiveness*) will be negatively cathected and will be avoided. For "facilitations" and "hinderings" in a direction opposite to the goal, of course, the converse of the above statements would be true.

In the *competitive situation*, with respect to locomotions of others in the direction of the goal, "helpfulness" would become negatively cathected, "obstructiveness" positively cathected. The converse would be true for locomotion in a direction opposite to that of the goal.

Up to this point, we have made some statements about substitutability,

cathexis, inducibility, and helpfulness in each of the two social situations, co-operation and competition, under each of two different circumstances—locomotions, etc., in the direction of the goal and in the direction opposite to the goal. In each of the situations, under different conditions, there is positive and negative cathexis, helpfulness and obstructiveness. To test the theory it is necessary to know which of the conditions are operating. The assumption will be made that under the experimental conditions set up to test the theory there will be more locomotions in the direction of the goal than in a direction away from the goal in both instances. From this assumption and the foregoing analysis it is possible to assert the following hypotheses:

Hypothesis 2: There will be greater substitutability for similarly intended actions among *Indiv co-op* as contrasted with *Indiv comp*.

Hypothesis 3: There will be a larger percentage of actions by fellow members positively cathected by *Indiv co-op* than by *Indiv comp*.

Hypothesis 3a: There will be a larger percentage of actions by fellow members negatively cathected by *Indiv comp* than by *Indiv co-op*.

Hypothesis 4: There will be greater positive inducibility with respect to fellow members among *Indiv co-op* than among *Indiv comp*.

Hypothesis 4a: There will be greater internal (self) conflict among *Indiv comp* than among *Indiv co-op*.

Hypothesis 5: There will be more helpfulness towards each other among *Indiv co-op* than among *Indiv comp*.

Hypothesis 5a: There will be more obstructiveness towards each other among *Indiv comp* than among *Indiv co-op*.

Step III: The Applications of the Psychological Implications of Co-operative and Competitive Situations to Small, Face-to-Face Group Functioning

In this step an attempt will be made to apply some of the psychological implications of the hypotheses derived in the preceding section to the functioning of small face-to-face groups. To draw out these implications for group functioning, additional assumptions will be necessary; these assumptions will be stated when recognized and when feasible. The aspects of group functioning to be considered will for convenience sake be arbitrarily grouped under the following headings: (a) Organization, (b) Motivation, (c) Communication, (d) Orientation, (e) Productivity, (f) Interpersonal Relations, and (g) Individual Behavior. No attempt will be made to exhaust the implications to be drawn with respect to these aspects of group functioning; it should also be clear that an empirical test of all of these implications was not possible in the experimental study to be reported later.

(a) Organization

Several different aspects of "organization" appear to be relevant to the differences between co-operation and competition: (i) Interdependence; (ii) Homogeneity of Sub-Units; (iii) Specialization of Function; (iv) Stability of Organization; (v) Situational Flexibility of Organization.

(i) *Interdependence*—From Hypothesis 4 (re positive inducibility), it seems evident that one would expect greater co-ordination of effort, as well as more frequent interrelationship of activity, among *Indiv co-op* than among *Indiv comp*.

Hypothesis 6: At any given time there will be more co-operation of

efforts (working together, interrelation of activities) among *Indiv co-op* than among *Indiv comp*.

Hypothesis 6a: Over a period of time, there will be more frequent co-ordination of efforts among *Indiv co-op* than among *Indiv comp*.

(ii) *Homogeneity*—If we assume that the individuals composing the various groups, in both the co-operative and competitive situation, differ from one another with respect to ability or personal inclinations to contribute, etc., it is possible from the substitutability hypothesis (Hyp. 2) to derive:

Hypothesis 7: There will be more homogeneity with respect to amount of contributions or participations among *Indiv comp* than among *Indiv co-op*.

The above hypothesis follows from the consideration that the contribution of an *Indiv co-op* can be a substitute for similarly intended contributions by another *Indiv co-op*; this does not hold for *Indiv comp*. In the co-operative situation, if any individual has ability and contributes, there is less of a need for another individual to contribute—this factor is likely to produce heterogeneity in amount of contributions.

(iii) *Specialization of Function*—Making the same kinds of assumptions as above plus the additional ones that the individuals compromising the various groups differ in respect to ability and/or interest in performing the various functions (e.g.—"orienting," "elaborating," "co-ordinating," etc.), necessary for successful task completion (and are aware of these differences in aptitude or interest) it is possible to derive, from the substitutability hypothesis, the following:

Hypothesis 8: There will be greater specialization of function (i.e.—different individuals fulfilling different functions) among *Indiv co-op* than among *Indiv comp*.

If we assume some time or achievement pressure, from the substitutability hypothesis it is also possible to derive:

Hypothesis 9: There will be greater specialization with respect to content or activity (i.e.—different individuals taking different aspects of the task and working on them simultaneously) among *Indiv co-op* than among *Indiv comp*.

The structure of certain kinds of tasks make it extremely difficult for this type of specialization to take place. So that one would expect fewer differences between *Indiv co-op* and *Indiv comp* on some tasks and more on others.

(iv) and (v) *Stability and Situational Flexibility of Organization*—

If specialization of function occurs, and we assume that expectations are established as a result of this specialization and that these expectations act as a determinant of behavior, we would expect:

Hypothesis 10: There would be greater structural stability (from like situation to like situation) with respect to functions assumed among *Indiv co-op* than among *Indiv comp*. This difference should increase with time.

From the lack of substitutability among *Indiv comp* one can derive a rigidity, each individual always trying to fulfil all the functions. Stability of structure among *Indiv co-op* may result in some perseverance but there does not seem to be any reason to equate rigidity and stability.

Hypothesis 11: In the face of changing circumstance, more organizational flexibility (change of roles to adapt to circumstance) will be manifested among *Indiv co-op* than among *Indiv comp*.

(b) Motivation

There are three things to consider when making a force analysis: (i)

direction of the force; (ii) strength of the force; and (iii) point of application of the force.

(i) *Direction of the Force*—From the hypothesis about positive inducibility it can be expected that:

Hypothesis 12: The direction of the forces operating on *Indiv co-op* would be more similar than the direction of the forces operating on *Indiv comp*.

This being the case, other things being equal, one would expect more rapid locomotions—i.e., more rapid decisions and reaching of agreements by co-operative groups. Another point to be considered here is that of the frame of reference with respect to locomotion in the co-operative and competitive situations. In the competitive situation the individual is oriented to locomotions relative to the locomotions of the other individuals with whom he is competing (the rivalry ratio); in the co-operative situation meaningful locomotion units are defined in relation to task completion. If this is the case it can be expected that:

Hypothesis 13: The directions of the forces operating on *Indiv co-op* would be more toward task closure than would be the directions of the forces operating on *Indiv comp*—i.e., there is more achievement pressure on the *Indiv co-op*.

(ii) *Point of Application of the Force*—From the hypothesis of positive inducibility we can assert that a force on any *Indiv co-op* is likely to be paralleled by a force on other *Indiv co-op*. This, if we define *group motivation* as some complex function of the strength of forces that operate simultaneously on all individuals as a function of their interrelationship with respect of positive inducibility, it follows that:

Hypothesis 14: The group force in the direction of the goal in a co-operative group will be stronger than such a group force in a competitive group.

This hypothesis has somewhat the same operational significance as hypotheses 12 and 13.

(iii) *Strength of Force*—From positive inducibility we would expect more additional own forces to be induced on the *Indiv co-op* once he is exposed to induction by other members; in the competitive situation due to combined negative and positive induction one would also expect the production of more own forces. If to the concept of the sum of the strength of forces operating on an individual we co-ordinate "interest" or "involvement," there does not seem to be any clear-cut rationale for predicting differences between the situations.

Hypothesis 15: There will not be a significant difference in the total strength of the forces (interest, involvement) operating on the *Indiv co-op* and *Indiv comp* in their respective situations¹³ (making the assumptions that situationally irrelevant ego-systems do not become involved).

(c) Communication

The term "communication," in its widest sense, is used to cover any instance of the establishment of a commonage, that is, the making common of some property to a number of things. For the present purpose, we will follow Morris (19) and limit the word "communication" to mean "the arousing of common significata through the production of signs"; the establishment of a commonage other than that of signification, whether it be by signs or other means, again following Morris' usage, will be called "communization." From the communicator's point of view, communication

may be considered a special case of exerted positive induction—i.e., the use of signs to induce in the communicatee sign-behavior similar to that of the communicator. Normally, for the communicator, the process of communication stands in a means relationship to some such purpose as informing, persuading, or being expressive of one's self.

There are three principal elements to the definition of communication: (i) "The production of signs," (ii) "the arousing of," (iii) "common significata". Let us see what implications our basic hypotheses have for these different aspects of the communication process.

(i) "*The Production of Signs*"—If we assume that in certain kinds of tasks (notably, tasks in which there are no clearly discernible "objective" criteria of locomotion—i.e., tasks in which the group itself provides the criteria for judging locomotion) the production of signs can be perceived as a means of locomotion, it is possible to make certain derivations (with additional assumptions) about the quantity of such production in the co-operative and competitive situations. First, it should be made clear that the production of signs by an individual within a group can be made with or without the intent to communicate to the other individuals in the group. Thus, an individual can produce signs under the assumption that "talking" is a means of locomoting, or an individual may produce signs with the intent of communicating with some one outside the group (for example, a "judge" or "observer").

From the substitutability hypothesis and the additional assumptions that: (a) it is perceived that locomotion takes

¹³ It may be argued that in our culture a competitive situation evokes more basic motives and would thus result in more ego involvement. This may well be true. However, in the present experimental situation, the co-operative groups were in a position of inter-group competition, thus possibly eliminating differential ego-involvement.

place either through the utterance of many good ideas (i.e., the production of many signs that will be evaluated highly) or through the frequent persuasion or informing of others via communication; (b) quantitative efforts do not seriously interfere with qualitative efforts or that, if they do, quantity is seen to be as or more important than quality: and (c) the time space available per unit of time allows for more production of signs than are necessary for optimal, solution of any problem—it is possible to derive:

Hypothesis 16: When the task-structure is such that production in quantity of observable signs is perceived to be a means for locomotion, there will be a greater total of signs produced per unit of time by the *Indiv comp* than by the *Indiv co-op*.

From the hypothesis about the co-ordination of effort (Hyp. 6 and 6a) in tasks one would expect that:

Hypothesis 17: When the task structure is such that locomotion is possible without the production of observable signs, there will be a greater total production of such signs per unit time by the *Indiv co-op* than by the *Indiv comp*.

(ii) "*The arousing of*"—If from the communicator's point of view, communication can be considered a locomotion or a means of locomotion, the state of receptivity (i.e., the readiness to be aroused) in the communicatee stands in a potential relation of facilitating or hindering the locomotions of the communicator. From the hypotheses re helpfulness and obstructiveness (Hyp. 5 and 5a), it can be derived that:

Hypothesis 18: There will be less attentiveness (readiness to be aroused) to each other's production of signs among *Indiv comp* than among *Indiv co-op*.

(iii) "*Common Significata*"—If one

assumes that attentiveness is a condition for the arousing of common significata, it follows:

Hypothesis 19: The production of signs by *Indiv comp* will less frequently result in common significata among other *Indiv comp* than will be the case for the production of signs by *Indiv co-op*.

Even when attentiveness is present, there seems to be reason to believe that there is greater likelihood of distortion by communicatees in the competitive situation. This is a consequence of the fact that in the competitive situation, locomotion is likely to be perceived in terms of its effect on relative position (the rivalry ratio); in the co-operative situation the locomotion of any individual is likely to be perceived as resulting in the locomotion of the others. The consequence of this difference is that the expressive characteristics of the production of signs are likely to be more significant to *Indiv comp*. A sign is expressive if the fact of its production is itself a sign to its interpreter of something about the producer of a sign. Tolman's concept of sign-magic (doing to the sign what the organism is predisposed to do to the significata of that sign) combined with his concept of sign-gestalt (25) helps to explain why it is likely that:

Hypothesis 20: There will be more lack of common signification, even when attentiveness is optimal, among *Indiv comp* than among *Indiv co-op*.

From the hypothesis with respect to positive inducibility it follows directly that:

Hypothesis 21: There will be more common appraisals (mutual agreements and acceptances) of communications by communicators and communicatees among *Indiv co-op* than among *Indiv comp*.

(d) Orientation

There are several aspects of orientation: (i) Orientation of members to each other; (ii) Commonality of perceptions of goal, position, direction to goal, and steps in the path to the goal.

(i) *Orientation of Members to Each Other*—The question here is: How well do the members know each other's opinions, values, aptitudes, etc.? From the hypothesis with respect to communication, one can assert (a qualification must be added with respect to the *Indiv co-op* who communicate little, as per heterogeneity hypothesis) that:

Hypothesis 22: The *Indiv co-op* will have more knowledge about its active members than will the *Indiv comp*.

(ii) *Commonality of Perception*—We will define group orientation to exist to the extent that there is commonality of perception among the members. Group orientation can be assessed in relation to goals, position at a given time, direction to goal, or steps in path to the goal. From the communication hypothesis and from the hypothesis of positive inducibility one can derive that:

Hypothesis 23: There will be more group orientation among the *Indiv co-op* than among the *Indiv comp*.

(e) Group Productivity

There are various possibilities of defining "group productivity." One could define it in terms of motivation reduction of the members, in terms of the entity produced, in terms of a group's realization of its potential, etc. For present purposes we shall consider group productivity in terms of the entity produced by the group, and, in terms of the learning of the individuals composing the groups.

From the hypothesis with respect to strength of group motivation (Hyp. 14), assuming that, other things being equal, locomotion will proceed more rapidly

the stronger the motivation, one can derive that:

Hypothesis 24: The *Indiv co-op* (as a group) will produce more per unit of time than will the *Indiv comp* (as a group).

Hypothesis 24a: It will take less time for the *Indiv co-op* (as a group) to produce what the *Indiv comp* (as a group) produces.

If we assume that any or all of the following are negatively related to group productivity (in respect to quality of product): lack of co-ordination, communication difficulties, persisting internal conflict, lack of group orientation, we can derive that:

Hypothesis 25: The qualitative productivity of the *Indiv co-op* (as a group) will be higher than that of *Indiv comp* (as a group).

From the hypotheses about communication and the hypotheses with respect to positive inducibility, with the additional assumption that the individuals composing the various groups have information and a background of experience that could benefit the other individuals, it is possible to derive that:

Hypothesis 26: The *Indiv co-op* will learn more from each other than will the *Indiv comp*. (The more knowledgeable and experienced of the *Indiv co-op* would, of course, learn less than the not so well-informed *Indiv co-op*).

(f) Interpersonal Relations

There are various things to be considered here: (i) Valence of the actions of fellow members, of the group, of the situation, and the extent of the generalization of this property; (ii) The occurrence of group or individual functions; (iii) The perception of effect on others; (iv) The incorporation of the attitude of the generalized other.

(i) *Valence or Cathexis of the actions*

of fellow members, etc.—From the hypotheses with respect to cathexis (Hyp. 3 and 3a) we expect the actions of fellow members to be more positively cathected among *Indiv co-op* than among *Indiv comp*. We would also expect the perceived source of these actions to acquire, to some extent, a cathexis similar to that held with respect to the actions.

Hypothesis 27: There will be more friendliness among *Indiv co-op* than among *Indiv comp*.

The extent of generalization of the cathexis will be a function of the centrality for the person of the goals he has involved in the situation of co-operation or competition. Thus, if the situation is important to the person, we would expect his perceptions of the personalities of other members to be affected by the cathexis¹⁴, we would also expect the friendliness or lack of it to generalize to other situations, etc.

Just as Hyp. 27 follows from the original cathexis hypothesis, it seems likely that the cathexis will be generalized to the products of the joint actions of fellow members and oneself—i.e., the group products.

Hypothesis 28: The group products will be evaluated more highly by *Indiv co-op* than by *Indiv comp*.

(ii) *The Occurrence of Group or Individual Functions*—If we define as “group functions” any actions which are intended to increase the solidarity of the group, or to maintain and regulate the group so that it functions “smoothly” and assert that “group functions” are seen to be “helpful” (i.e.—facilitate locomotion) it follows from the “helpfulness” hypothesis (Hyp. 5a) that:

Hypothesis 29: There will be a greater percentage of group functions among *Indiv co-op* than among *Indiv comp*.

If we define “individual functions” to include any actions of the individual which are not immediately directed toward task solution and which are not “group functions” (i.e., actions which are obstructive, blocking, aggressive, or self-defensive, etc., are “individual functions”) it follows from the “obstructiveness” hypothesis (Hyp. 5a) that:

Hypothesis 30: There will be a greater percentage of individual functions among *Indiv comp* than among *Indiv co-op*.

(iii) *The Perception of Effect on Others*—There seem to be two questions here: (a) How realistic are the individual's perceptions of his effects on others? and (b) What kinds of effects are the individuals likely to have in the differing social situations?

From the communication hypothesis, it was developed (Hyp. 22) that over a period of time *Indiv co-op* should know more about the attitudes of (active) fellow members than is the case for *Indiv comp*. Using the same reasoning, and making the assumption that the communication difficulty with respect to this content is also greater for *Indiv comp*, it follows that:

Hypothesis 31: The perception of the attitudes of the others towards aspects of one's own functioning in the group, etc., by *Indiv co-op* should be more realistic than such perceptions by *Indiv comp*.

From the inducibility hypothesis, it also follows that:

Hypothesis 32: The attitudes of any individual with respect to his own functioning should be more similar to the attitudes of the others with respect to his functioning among *Indiv co-op* than among *Indiv comp*.

From Hyp. 31 and the cathexis

¹⁴ See F. Heider (9).

hypothesis we can derive that *Indiv co-op* will tend to perceive that they have a favorable effect on the others in the group. If we make the assumption of "autistic hostility" (20)—that is, that hostile impulses under conditions of reduced communication tend to create the expectation of counter-hostility, we can demonstrate that:

Hypothesis 33: *Indiv co-op* will perceive themselves as having more favorable effects on fellow-members than will *Indiv comp*.

(iv) *The Incorporation of the Attitude of the "Generalized Other"*¹⁵—The term "attitude of the generalized other" refers to an internalized structure which is developed as a result of introjecting the mutually interacting attitudes of those with whom one is commonly engaged in a social process. From our preceding development it is clear that the development of the "attitude of the generalized other" requires communication and positive inducibility. It follows then, that:

Hypothesis 34: Incorporation of the attitude of the generalized other will occur to a greater extent in *Indiv co-op* than in *Indiv comp*.

The operational implications of the preceding hypothesis are similar to those of the co-ordination and orientation hypothesis. It has further implications in terms of group development which will not be drawn here. For present purposes, the "feeling of responsibility" to other members will

be taken as an operational definition of the degree of internalized attitude of the generalized other.

(g) Individual Behavior

No attempt will be made in this study to derive how individuals with certain personality characteristics will behave nor what the reactions of other individuals to such behavior will be in the two different types of situation—co-operation and competition. Suffice it to say, that it is evident that one would expect more behavioral homogeneity in competitive situations than in co-operative situations. It is also apparent that the reactions of others to a "stupid" individual (one who hinders locomotion or locomotes in the wrong direction) or to a "bright" individual will vary significantly from one situation to another.

(h) The Course of Development with Time

From our theory one would predict quite different developments in successful and unsuccessful co-operative groups. Similarly, important developmental differences would occur in competitive situations in which reward over a period of time was all accumulated by one individual as compared with competitive situations in which over a period of time different individuals were rewarded. The derivation of these predictions will not be attempted in this article.

SECTION C

The Concept of "Group"

In the introductory paragraphs of this article it was suggested that a linkage existed between the conceptualization of the co-operative situation and

the concept of group and that this linkage provided the possibility for the derivation and empirical testing of group hypotheses. The task of this section will be to clarify the nature of

¹⁵ The concept of "generalized other" plays a crucial role in the social psychology of G. H. Mead (17).

the linkage and to define some group concepts. As a brief introduction, let us consider the questions: (i) "In what sense, if any, do groups exist?"; (ii) "What are some of the existing formulations with respect to groups?"

(a) In What Sense, if any, Do Groups Exist?

Kurt Lewin (8) has emphasized the importance of the belief in the "existence" of something as a psychological prerequisite for the scientist's interest in that something as an object for scientific investigation. He suggests that "the taboo against believing in the existence of a social entity is probably most effectively broken by handling this entity experimentally." The pioneering works of Lippitt (11) and French (3) have done much to shatter the scientific belief that groups do not exist—the belief, therefore, that the concept of "group" has no empirical reference.

The resistance to the acceptance of the belief in the "reality" of groups stems largely from what Whitehead (27) has called "The Fallacy of Misplaced Concreteness." The very words used in phrasing the question "In what Sense . . ." implied the acceptance of the fallacy that for anything to be real it must have "simple location" in physical space-time. It is clear that many groups do not have the property of simple location; that is, one cannot answer the question "Where?" in terms of a physical space. The lack of physical *locus* for a group has confused many people and has led them to react to the concept of group as though it could have no meaningful empirical co-ordinates. Yet it should be clear that many of these same people have unwittingly accepted concepts such as "the person" which a more than superficial analysis would reveal have

no simple locations, fallaciously concretizing concepts which are quite "abstract."

Another related source of resistance to the acceptance of the "reality" of groups, has been the argument that we cannot scientifically speak of a group as deciding and acting, since it is the individuals that compose the group that decide and act. Child (2) has, in answer to such argument, pointed out that the same kind of objection could be raised with respect to considering the individual as a unit; it too is composed of sub-units, which in turn are composed of sub-units, etc. It is clear that this argument has to do with the size of unit that is most fruitful in the investigation of any scientific problem. This is a problem in the pragmatics of science. It is believed that the concept of "group" will have the same value for the study of social phenomena that the concept of the "individual" has had for the study of psychological phenomena (12). It is further believed that the concepts "individual" and "group" have two crucial similar attributes—the idea of organization or patterning of its sub-parts and the idea of motivation; organization being established in the course of purposeful striving in relation to the environment (23).

To sum up, the answer to the question "In what sense, if any, do groups exist?" is simply that groups exist as concepts that have empirical references. Their usefulness as concepts depend in part on the nature of the relationship of the concept "group" to other concepts and in part on the nature of the empirical co-ordinations.

(b) What are some of the Existing Formulations with respect to Groups?

No attempt will be made here to make a thorough census of formulations

with respect to groups. Wilson (28) has recently attempted such a summary of sociological formulations. From this summary it is apparent that the group concept is pivotal in the thinking of many sociologists. The works of such sociologists as Durkheim ("The Division of Labor"), Simmel (the effect of size upon group organization, interaction processes, etc.), Von Weise (a classificatory approach to groups), Cooley ("Social Process" and "Social Organization"), Brown ("Social Groups"), and Coyle ("Social Process in Organized Groups") have much to offer in the way of fruitful hypotheses for experimental research. Wilson, however, summarized his survey by asserting that there exists "a prevailing ambiguity of conceptualization and classification with reference to the group in the whole field of sociology."

Yet if we look carefully at the definitions used by sociologists we find a common core, based on the idea of "interaction." (Some sociologists use the word "group" to include also "categories" based on similarities, "aggregates" based on proximity, as well as "groups" based upon "psychic" interaction). In most usages it is not made explicit whether interaction is defined in terms of an objective, social interdependence or a psychological interdependence. In addition to the criterion of interaction some sociologists, e.g., Znaniecki (29) and Newstetter (21), have stated that the concept of group includes "a feeling of identification," or "realization of a selective bond." Sociologists have, in considering the relationship of the individual and the group, tended to emphasize the incompleteness of the individual without the group (Durkheim's concept of "anomie").

Koffka (6) makes a distinction between "sociological" (geographical)

groups and "psychological" (behavioral) groups. He asserts that *sociological groups* are "gestalts" and as gestalts they have characteristics which are somewhat distinctive. In the first place the "strength" of the gestalt (the degree of interdependence) may differ over an enormously wide range; secondly, the individuals composing the group are not completely determined by the group. The reality of the *psychological group* is expressed in the pronoun "we," "we" implying here the feeling of unity in joint action. As used by Koffka the phrase "psychological group" refers to an individual life space, the phrase "sociological group" refers to a group space. He asserts that a sociological group of n members presupposes n psychological groups. Koffka has many stimulating suggestions to offer with respect to the conditions of group formation, group structure, and with respect to the relation of the individual to the group.

French states two criteria for the existence of a group: inter-dependence and identification. He defines "identification conceptually in terms of two dynamic factors: (a) belonging to the group has, for its members, a positive valence, (b) compared to the non-members, the members accept to a greater degree the forces induced by the group" (3, p. 275). Interdependence is the basic criterion; not all psychological groups presuppose identification.

One of the most stimulating contributions to the theory of groups and organization is presented in Barnard's "The Functions of the Executive" (1). This work, which must be considered a "basic work" in this field, is too pregnant with ideas to permit any concise summary. He suggests that the word "group" is most appropriately applied to the relationship of co-operation, which is a system of interactions.

He also points out, as Koffka has done, (but in rather different terminology) that: (i) the group or organization as a system has properties independently of the persons composing the group; (ii) the persons composing a group possess some characteristics which may not be pertinent to the group and the group, of course, does not completely determine the person. In effect, Barnard uses the term "member" to apply to the group relevant aspects of the person. Any person may have many different memberships.

He asserts "an organization comes into being when (i) there are persons able to communicate with each other, (ii) who are willing to contribute action (iii) to accomplish a common purpose. These elements are necessary and sufficient conditions initially . . . For the continued existence either effectiveness or efficiency is necessary" (1, p. 82). That is, an organization cannot persist unless the individuals obtain more satisfaction than discomfort in the course of directly obtaining the specific objectives of the organization or unless they do it indirectly.

The conceptualization to be offered below, though not influenced by Barnard, is in many respects similar to his.

(c) *A Proposed Formulation:*

Basic definitions:

1. A sociological group¹⁶ exists (has unity) to the extent that the individuals or sub-units composing it are pursuing promotively interdependent goals.

2. A psychological group¹⁶ exists (has unity) to the extent that the individuals composing it perceive themselves as pursuing promotively interdependent goals.

3. A psychological group has cohesiveness as a direct function of the strength of goals perceived to be promotively interdependent and of the degree of perceived interdependence.

The following definitions are reformulations of the above definitions from the point of view of membership.

1a. Individual or sub-units belong in a sociological group to the extent that they are pursuing promotively interdependent goals.

2a. Individuals or sub-units possess membership in a psychological group to the extent that they perceive themselves as pursuing promotively interdependent goals.

3a. Individuals or sub-units possess membership motive in a psychological group as a direct function of the strength of goals perceived to be promotively interdependent and of the degree of perceived interdependence.

The conceptualization of the co-operative situation (see Section B) is, of course, identical with the definition of the sociological group. It follows that if *Indiv co-op* and *Indiv comp* are equated in other respects, *Indiv co-op* will possess more unity as a sociological group than will *Indiv comp*. From the logical and psychological consideration advanced in the preceding sections it would also follow that the *Indiv co-op* will possess more unity as a psychological group than will the *Indiv comp*. Since all the hypotheses in the preceding sections were relative statements, based on the assumption that the *Indiv co-op* and *Indiv comp* were equated in other respects, it is possible to substitute for "*Indiv co-op*" the phrase "a psychological group with greater unity," and to substitute for "*Indiv comp*" the phrase, "a psychological group with lesser unity."

¹⁶ It should be noted that these terms are not being used as Koffka has used them.

Thus, in effect, through creation of a co-operative and a competitive situation it becomes possible to test empirically the effect of variation

in degree of unity or strength of membership motive of a psychological group upon the functioning of groups.

SUMMARY

In this article an attempt has been made to sketch out a theory of co-operation and competition and to apply this theory to the functioning of small groups. The development has proceeded by the following steps: (i) the social situations of co-operation and competition were defined; (ii) some of the logical implications inherent in the definitions were pointed to; (iii) with the introduction of psychological assumptions, some of the psychological implications of the definitions of the two objective social situations were then drawn; (iv) the psychological implications, with the aid

of additional psychological assumptions, were then applied to various aspects of small-group functionings to develop a series of hypotheses about the relative effects of co-operation and competition upon group process; and (v) finally, the concept of group was defined and linked with the concept of co-operation, thus making all of the preceding theoretical development with respect to co-operation relevant to group concepts.

In a forthcoming article, an experimental study of the effects of co-operation and competition upon group process will be reported.

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