GROUP DYNAMICS

Ellison, McBride, and Gregory, cohesiveness affects group productivity, which does not necessarily increase or decrease. Cohesiveness or attraction may the susceptibility of group members. Thus if the predominant cohesiveness will tend to heighten group productivity. If, on the other hand, the cohesion, cohesiveness will tend to

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roles of group members. Journal of


3-14, 395-402.

ion of the relationship between four
different tasks. Journal of Psychology,

83. group treatment. British Journal of

communication patterns on group per


A the role of the ego in work: 1. The

Journal of Experimental Psychology,

A experimental study of the role of
task orientation in work. Journal of

215.

Journal of Abnormal and Social

the group and its effects on the per

son's dissertation, Univ. of Michigan.

A on group performance of an in

by one group member. Journal of

177.

performance. Personnel, 1949. 25,

individuals and small groups in the ra


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The Effects of Cooperation and Competition upon

Group Process

Morton Deutsch

The concept of cooperation and the interrelated concept of competition are rarely missing in discussions of interpersonal and intergroup 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 processes, there has been little in the way of explicit theorizing and virtually no experimental work with respect to the effects of cooperation and competition upon social processes. 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 cooperative or competitive social situation.

The purpose of this article is to sketch out a theory of the effects of cooperation and competition upon small (face-to-face) group functioning and to present the results of an experimental study of such effects.

PART I

A Conceptualization of the Cooperative and Competitive Situations with a Development of Some of Its Logical and Psychological Implications

In a cooperative social situation the goals for the individuals or subunits in the situation under consideration have the following characteristics: the goal regions for each of the individuals or subunits in the situation are defined so that a goal region can be entered (to some degree)

This chapter is a condensation of two separate articles. The reader is referred to the original articles for more complete treatment: Human Relations, 1949, 2, 129-152 and 199-231. This material is reprinted by permission of the author and of Human Relations.
by any given individual or subunit only if all the individuals or subunits under consideration can also enter their respective goal regions (to some degree). For convenience's sake, the phrase *promotively interdependent goals* will be used to identify any situation in which the individuals or subunits composing it have their goals interrelated by the characteristic defined above.

In a competitive social situation the goals for the individuals or subunits in the situation under consideration have the following characteristic: the goal regions for each of the individuals or subunits in the situation are defined so that, if a goal region is entered by any individual or subunit (or by any given portion of the individuals or subunits under consideration), the other individuals or subunits will, to some degree, be unable to reach their respective goals in the social situation under consideration. For convenience's sake, the phrase *contrarily interdependent goals* will be used to identify any situation in which the individuals or subunits 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" cooperative or competitive. 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 contrarily interdependent with respect to another goal. Thus, for example, the members of a basketball team may be cooperatively 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 subgoals and contrarily interdependent with respect to goals, or vice versa. For instance, advertising concerns representing different cigarette companies may be cooperatively interrelated with respect to the subgoal 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.

No attempt will be made here to describe and analyze further the wide variety of "impure" cooperative and competitive situations which are found in everyday life. The theoretical development to be presented will be primarily concerned with "pure" cooperative and competitive situations. However, it is believed that in many circumstances not much theoretical extrapolation is necessary to handle the more complex situations.

From the definitions of promotively and contrarily 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 with persons A, B, C, etc.; (b) any person, X, who has contrarily interdependent goals with persons A, B, C, etc., will come to have contrarily interdependent locomotions with persons A, B, C, etc.

The above statements are based on the observation that a locomotion by X in the direction of the goal region may be thought of as a conditio into the goal region may be thought of as a condition of the goal entry. Thus, for example, a locomotion by X or Y in the direction of the goal will be promotively or competitively interdependent with respect to locomotions by Z or others.

Several major differences between the cooperative and competitive aspects of the cooperative situation arise from the fact that any one individual locomotion by any individual has a relative position in the activity of others, though it may affect their performance.

Up to this point we have stated that the concept of cooperation is inherent in the conceptualization of cooperative situations. No statements have been made to the contrary. However, statements have been made about objective social situations. How do conditions of the experiment differ from each other? One relatively simple assumption that individual is to be viewed is that the social situation is simple enough.

We may now proceed to state
GROUP DYNAMICS

if all the individuals or subunits respective goal regions (to some use promotorily or interdependent in which the individuals or interrelated by the characteristic

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goals with persons A, B, C, etc., will come to have contently inter-

dependent locomotions in the direction of his goal with persons A, B, C,

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The above statements are based on the following considerations. Locomo-

tion 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 promotorily or contently interdependent with the locomotions of

A, B, C, etc., in the direction of their goals, the nature of the interdepen-

dence with respect to locomotions depending upon the nature of the

interdependence with respect to goal regions.

Several major differences reveal themselves as inherent in the distinc-

tions between the cooperative and competitive social situations. The

alysis of the cooperative 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 situations, the various individuals may

occupy the same or different positions with respect to their goals. Locomo-

tion by any individual has no necessary effect on the locomotions of

others, though it may affect the relative positions of the various indi-

viduals.

Up to this point we have stated some of the consequences logically

inherent in the conceptualizations of simple cooperative and competitive

situations. No statements have been made which have a direct psycho-

logical 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 is 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. It should be apparent

that very complex assumptions are required to make any rigorously derived

predictions about behavior from an analysis of the characteristics of an

objective social situation. However, as this problem relates to the specific

conditions of the experiment to be reported here, we shall make the

relatively simple 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.

We may now proceed to state certain specific hypotheses.
Basic Hypotheses

Hypothesis 1. Individuals who are exposed to the cooperative social situation (Indiv coop) will perceive themselves to be more promotively interdependent (in relation to the other individuals composing their group) with respect to goal, locomotions, facilitations, and similar matters, than will individuals who are exposed to the competitive social situation (Indiv comp).

Hypothesis 1a. Indiv coop will perceive themselves to be more contriently interdependent (in relation to the other individuals composing their group) with respect to such matters as goal, locomotions, and facilitations than will Indiv coop.

For convenience's sake, let us direct our attention to the psychological implications of locomotion in the cooperative and the competitive situations. Let us analyze a hypothetical instance with respect to locomotion in the direction of the goal, in which A locomotes in the direction of his goal and the other individuals in the social situation perceive that A is locomoting.

1. The Cooperative Situation. Under these conditions X would be likely to perceive that he has locomoted toward his goal as a consequence of A's actions. Several implications seem directly to follow, if we accept certain additional psychological assumptions:

Substitutability. Since X has locomoted toward his goal as a consequence of A's actions, there is no longer any necessity for X to perform any action which is similar to A's.

Positive cathexis. If we make a rather widely accepted assumption that an entity will acquire positive valence or cathexis 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 cathexed by X. That is, X is likely to accept, like, or reward A's action.

Positive inducibility. Let us assume that inducibility derives from the fact that the inducible person perceives the inducing entity to be such that it can cause the intensification, continued persistence, or lowering of need tension within himself. Positive inducibility 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 capable of producing even more tension than before).

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 Negative inducibility is meant to include two related phenomena, (a) the production of additional own forces in the direction induced, and (b) the channeling of existing own forces in the direction induced.
GROUP DYNAMICS

The Effects of Cooperation and Competition

Facilitations and hinderings. If X facilitates the locomotion of A in the direction of his goal, he also facilitates his own locomotion. Thus, X's facilitations of others are likely to result in his own locomotion and therefore are 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. By similar reasoning, we conclude that acts hindering locomotion in the direction of the goal (obstructiveness) will be negatively cathected and will be avoided.

2. The competitive situation. Under conditions of competition essentially opposite conclusions to those above are to be drawn:
Substitutability. It is evident that there will be no substitutability.
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 (and therefore is seen to decrease the probability of need satisfaction). A's locomotions in the direction of his goal will, therefore, be negatively cathected by Y.
Negative inducibility. 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 noninducibility—the cognition that going in a direction opposite to or away from A's would be going in a direction opposite to or away from his own goal.
Facilitations and hinderings. When others locomote in the direction of the goal, helpfulness will become negatively cathected, obstructiveness positively cathected. The converse should be true for locomotion in a direction opposite to that of the goal.

We can, with the same kinds of assumptions, 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 cooperative situation, substitutability is not expected, but one would expect negative cathexis and negative inducibility. The competitive situation is not so unequivocal. Here one would expect positive cathexis and ambivalent inducibility or noninducibility.

Our statements about substitutability, cathexis, inducibility, and helpfulness are somewhat different in the two social situations, depending upon whether locomotions are made in the direction of the goal or away.

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2Negative inducibility is meant to include two related phenomena, (a) the production of additional own forces, and (b) channeling existing own forces in the direction opposite to that desired by the inducer.
from it. To test the theory experimentally, it is necessary, therefore, to make some assumption about the incidence of these two directions of locomotion. We assume that, under the experimental conditions set up to test the theory, in both social situations there will be more locomotions in the direction of the goal than in a direction away from the goal. 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 coop as contrasted with Indiv comp.

Hypothesis 3. There will be a larger percentage of actions by fellow members positively cathexed by Indiv coop than by Indiv comp.

Hypothesis 3a. There will be a larger percentage of actions by fellow members negatively cathexed by Indiv coop than by Indiv coop.

Hypothesis 4. There will be greater positive inducibility with respect to fellow members among Indiv coop than among Indiv coop.

Hypothesis 4a. There will be greater internal (self) conflict among Indiv comp than among Indiv coop.

Hypothesis 5. There will be more helpfulness towards one another among Indiv coop than among Indiv coop.

Hypothesis 5a. There will be more obstructiveness towards one another among Indiv coop than among Indiv coop.

**Implications for Group Functioning**

Let us turn now to the next step, that of applying some of the psychological implications of the hypotheses derived in the preceding section to the functioning of small face-to-face groups.

**Organization**

From Hypothesis 4 (positive inducibility), it seems evident that one would expect greater coordination of effort, as well as more frequent interrelationship of activity, among Indiv coop than among Indiv coop.

Hypothesis 6. At any given time there will be more coordination of efforts (working together, interrelation of activities) among Indiv coop than among Indiv coop.

Hypothesis 6a. Over a period of time, there will be more frequent coordination of efforts among Indiv coop than among Indiv coop.

If we assume that the individuals composing the various groups in both the cooperative and competitive situations differ from one another with respect to ability or personal inclinations to contribute, 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 coop than among Indiv coop.

**The Effects of Cooperation**

The above hypothesis follows from an Indiv coop can substitute by another Indiv coop. This supportive situation, if any individual need for another individual generosity in amount of contribut

Making the same kinds of as ones that the individuals compt to either ability, interest, or be necessary for successful task competency hypothesis to derive:

Hypothesis 8. There will be different individuals fulfilling than among Indiv coop.

If we assume some time or ac bility hypothesis it is also posit

Hypothesis 9. There will be gre or activity (i.e., different individ working on them simulant Indiv coop.

The structure of certain kind: this type of specialization to tal differences between Indiv coop others.

If specialization of function are established as a result of this act as a determinant of behavior,

Hypothesis 10. There will be gr ection to like situation) with resp coop than among Indiv coop. Ti

From the lack of substitutab rigidity, each individual always u of structure among Indiv coop m does not seem to be any reason to

Hypothesis 11. In the face of o tional flexibility (change of roles fested among Indiv coop than an

**Motivation**

From the hypothesis about posi Hypothesis 12. The direction of be more similar than the direction From this hypothesis one wou
Group Dynamics

It is necessary, therefore, to recognize that the two directions of experimental conditions set up there will be more locomotions away from the goal. From it is possible to assert the following substitutability for similarly instilled with Indiv coop.

Percentage of actions by fellow p than by Indiv coop.

Percentage of actions by fellow mp than by Indiv coop.

Inducibility with respect to nong Indiv coop.

Internal (self) conflict among

Pilfulness towards one another

Activeness towards one another

Functioning

Applying some of the psychological in the preceding section to

Group Dynamics

The Effects of Cooperation and Competition

The above hypothesis follows from the consideration that the contribution of an Indiv coop can substitute for similarly intended contributions by another Indiv coop. This does not hold for Indiv coop. In the cooperative situation, if any individual has ability and contributes, there is less need for another individual to contribute, producing greater heterogeneity in amount of contributions.

Making the same kinds of assumptions as above, plus the additional ones that the individuals comprising the various groups differ in respect to either ability, interest, or both, in performing the various functions necessary for successful task completion, it is possible from the substitutability hypothesis to derive:

Hypothesis 8. There will be greater specialization of function (i.e., different individuals fulfilling different functions) among Indiv coop than among Indiv coop.

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 coop than among Indiv coop.

The structure of certain kinds of tasks makes it extremely difficult for this type of specialization to take place. Thus, one would expect fewer differences between Indiv coop and Indiv coop on some tasks than on others.

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 will be greater structural stability (from like situation to like situation) with respect to functions assumed among Indiv coop than among Indiv coop. This difference will increase with time.

From the lack of substitutability among Indiv coop one can derive a rigidity, each individual always trying to fulfill all the functions. Stability of structure among Indiv coop may result in some perseverance but where this does not seem to be any reason to equate rigidity and stability.

Hypothesis 11. In the face of changing circumstances, more organizational flexibility (change of roles to adapt to circumstances) will be manifested among Indiv coop than among Indiv coop.

Motivation

From the hypothesis about positive inducibility one can expect:

Hypothesis 12. The direction of the forces operating on Indiv coop will be more similar than the direction of the forces operating on Indiv coop.

From this hypothesis one would expect more rapid locomotions, i.e.,
more rapid decisions and reaching of agreements by cooperative groups. Another point to be considered here is that of the frame of reference with respect to locomotion in the cooperative and competitive situations. In the latter situation, the individual is oriented to locomotions relative to those of other individuals with whom he is competing; in the cooperative situation, meaningful locomotion units are defined in relation to task completion. One can therefore expect:

Hypothesis 13. The directions of the forces on Indiv coop will be more toward task closure than will the forces on Indiv coop, i.e., there is more achievement pressure on Indiv coop.

From the hypothesis of positive inducibility we can assert that a force on any Indiv coop is likely to be paralleled by a force on other Indiv coop. Thus, if we define group motivation as some complex function of the strength of forces that operate simultaneously on all individuals in the group, there follows:

Hypothesis 14. The group force in the direction of the goal in a cooperative group will be stronger than such a group force in a competitive group.

From positive inducibility we would expect more additional own forces to be induced on Indiv coop 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 additional own forces. If to the concept of the sum of the strength of forces operating on an individual we coordinate 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 Indiv coop and Indiv coop.

Communication

From the substitutability hypothesis and the additional assumptions that (a) it is perceived that locomotion takes 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 quality or that, if they do, quantity is seen to be as important as or more important than quality; and (c) the time available 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 p than by Indiv coop.

From the hypothesis about the possible without the productio greater total production of such by Indiv coop.

Hypothesis 17. When the task is considered a locomotion or a mean i.e., the readiness to be aroused facilitate or hinder the locom hypoteses concerning helpfuls one can derive:

Hypothesis 18. There will be less of signs among Indiv coop

If attentiveness is a condition there follows:

Hypothesis 19. The production of signs will be less common significant among Indiv coop.

Even when attentiveness is present, the likelihood of distortion by commun since in this situation locomotion effect on relative position, while motion of any individual is like locomotion of the others. The expressive characteristics of the significant to Indiv coop. A sign is itself a sign to its interpreter i.e., sign.

Hypothesis 20. Common signi the a will be less prevalent among

From the hypothesis of positive

Hypothesis 21. There will be w ments and acceptances of comm unicates among Indiv coop th:

Orientation

From the hypothesis about the

Hypothesis 22. Indiv coop will y members than will Indiv coop. Group orientation, as we defi
Group Dynamics

Elements by cooperative groups, at the frame of reference with competitive situations. Intended to locomotions relative to competing; in the cooperative are defined in relation to task forces on Indiv coop will be more a Indiv comp, i.e., there is more ability we can assert that a force by a force on other Indiv coop, some complex function of the usly on all individuals in the direction of the goal in a com a group force in a competitive select more additional own forces exposed to induction by other due to combined negative and the production of additional the strength of forces operating or involvement, there does not dicting differences between the significant difference in the total ent) operating on Indiv coop

The Effects of Cooperation and Competition

will be a greater total of signs produced per unit of time by Indiv comp than by Indiv coop.

From the hypothesis about the coordination of effort in tasks (Hyps. 6 and 6a), one would expect:

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 Indiv coop than by Indiv comp.

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 can potentially facilitate or hinder the locomotions of the communicator. From the hypotheses concerning helpfulness and obstructiveness (Hyps. 5 and 5a) one can derive:

Hypothesis 18. There will be less attentiveness to one another's productions of signs among Indiv comp than among Indiv coop.

If attentiveness is a condition for the arousing of common significata, there follows:

Hypothesis 19. The production of signs will less frequently result in common significata among Indiv comp than among Indiv coop.

Even when attentiveness is present, there probably will be a greater likelihood of distortion by communicatees in the competitive situation, since in this situation locomotion is likely to be perceived in terms of its effect on relative position, while in the cooperative 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 the sign.

Hypothesis 20. Common significata, even when attentiveness is optimal, will be less prevalent among Indiv comp than Indiv coop.

From the hypothesis of positive inducibility, there follows directly:

Hypothesis 21. There will be more common appraisals (mutual agreements and acceptances) of communications by communicators and communicatees among Indiv coop than among Indiv coop.

Orientation

From the hypothesis about communication, one can assert:

Hypothesis 22. Indiv coop will have more knowledge about other active members than will Indiv comp.

Group orientation, as we define it, exists to the extent that there is
commonality of perception among the members. It can be assessed in relation to goals, position at a given time, direction to the goal, or steps in the path to the goal. From the hypotheses concerning communication and positive inducibility, one can derive:

**Hypothesis 23.** There will be more group orientation among Indiv coop than among Indiv comp.

**Group Productivity**

From the hypothesis with respect to strength of group motivation (Hyp. 14), assuming that locomotion will proceed more rapidly the stronger the motivation, one can derive:

**Hypothesis 24.** Indiv coop as a group will produce more per unit of time than will Indiv comp as a group.

**Hypothesis 24a.** It will take less time for Indiv coop as a group to produce what Indiv comp as a group produce.

Let us assume that any or all of the following are negatively related to group productivity in respect to quality of product: lack of coordination, communication difficulties, persisting internal conflict, and lack of group orientation. We can then derive:

**Hypothesis 25.** The qualitative productivity of Indiv coop as a group will be higher than that of Indiv comp as a group.

From the hypotheses about communication and about positive inducibility, with the additional assumption that the individuals in the various groups have information and experience that can benefit the others, it is possible to derive:

**Hypothesis 26.** Indiv coop will learn more from one another than will Indiv comp. (The more knowledgeable and experienced of Indiv coop will, of course, learn less than the not so well-informed Indiv coop.

**Interpersonal Relations**

From the hypotheses about cathexis (Hyps. 8 and 9a), we expect the actions of fellow members to be more positively cathected among Indiv coop than among Indiv comp. We also expect the perceived source of these actions to acquire, to some extent, a cathexis similar to that held with respect to the actions. Thus, there follows:

**Hypothesis 27.** There will be more friendliness among Indiv coop than among Indiv comp.

By similar reasoning, it follows that the cathexis will be generalized to the products of the joint actions of fellow members and oneself, i.e., the group products. Thus, we propose:

**Hypothesis 28.** The group pr Indiv coop than by Indiv comp.

If we define group functionscrease the solidarity of the group so that it functions smoothly, a be helpful, from the hypothesis

**Hypothesis 29.** There will be among Indiv coop than among

If we define individual functions are not immediately directed group functions (actions which self-defense are individual function to)

**Hypothesis 30.** There will be inner group more among Indiv coop than among

From the hypothesis concern (Hyp. 22) that over a period of Indiv coop about the attitude same reasoning, and making the difficulty with respect to the con follows:

**Hypothesis 31.** The perceptio aspects of one's own functionin more realistic than such percep

From the hypothesis about in

**Hypothesis 32.** The attitudes functioning should be more si respect to his functioning among

From Hypothesis 31 and the with respect to Indiv coop that the group. If we make the assu hostile impulses under condi create the expectation of count

**Hypothesis 33.** Indiv coop willable effects on fellow members dl

The term attitude of the gen structure which is developed as acting attitudes of those with the process. From our preceding dis the attitude of the generalized of inducibility. There follows, then

**Hypothesis 34.** Incorporation o occur to a greater extent in Indiv
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Hypothesis 28. The group products will be evaluated more highly by Indiv coop than by Indiv comp.

If we define group functions as 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, from the hypothesis about helpfulness (Hyp. 5a) there follows:

Hypothesis 29. There will be a greater percentage of group functions among Indiv coop than among Indiv comp.

If we define individual functions as any actions of the individual which are not immediately directed toward task solution and which are not group functions (actions which are obstructive, blocking, aggressive, or self-defensive are individual functions), from the hypothesis about obstructiveness (Hyp. 5a) there follows:

Hypothesis 30. There will be a greater percentage of individual functions among Indiv coop than among Indiv comp.

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

Hypothesis 31. The perception of the attitudes of the others towards aspects of one’s own functioning in the group by Indiv coop should be more realistic than such perceptions by Indiv comp.

From the hypothesis about inducibility, there also follows:

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 coop than among Indiv comp.

From Hypothesis 31 and the hypothesis about cathectic, we can derive with respect to Indiv coop that he has a favorable effect on the others in the group. If we make the assumption of autistic hostility, that is, that hostile impulses under conditions of reduced communication tend to create the expectation of counter-hostility, we can demonstrate:

Hypothesis 33. Indiv coop will perceive himself as having more favorable effects on fellow members than will Indiv comp.

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 discussion, it is clear that the development of the attitude of the generalized other requires communication and positive inducibility. There follows, then:

Hypothesis 34. Incorporation of the attitude of the generalized other will occur to a greater extent in Indiv coop than in Indiv comp.
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For present purposes, the feeling of obligation to other members will be taken as an operational definition of the degree of internalized attitude of the generalized other.

The Concept of Group

In concluding this theoretical analysis, let us suggest a linkage between the conceptualization of the cooperative situation and the concept of group. We propose a linkage similar to certain proposals of Koffka (3) and Barnard (1).

We present the following definitions:

1. A sociological group exists (has unity) to the extent that the individuals composing it are pursuing promotively interdependent goals.

2. A psychological group 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. Individuals or subunits belong in a sociological group to the extent that they are pursuing promotively interdependent goals.

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

3a. Individuals or subunits 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 cooperative situation is, of course, identical with the definition of social group. It follows that if Indiv coop and Indiv comp are equated in other respects, Indiv coop will possess more unity as a sociological group than will Indiv comp. From the logical and psychological considerations advanced above it also follows that Indiv coop will possess more unity as a psychological group than will Indiv comp. Since all our hypotheses are relative statements based on the assumption that Indiv coop and Indiv comp are equated in other respects, it is possible to substitute for Indiv coop the phrase a psychological group with greater unity and to substitute for Indiv comp the phrase a psychological group with lesser unity.

The Effects of Cooperation

Part II

An Experimental Study of Petition upon Group

The Exp

In setting up the experiment to have the following: (a) subjects who would regularly sufficient of time; (b) some degree of control (to be able, through manipulation, cooperation or competitive situation.

The somewhat unorthodox in the Industrial Relations Section appeared to provide the cooperation of the Industrial I make the experimental sessions attendance was thus assured. The grades and assignments also prove the goals of the subjects.

At the first meeting of the various departments was interested in to form some small sections to instructor. These sections would be regularly scheduled three one to the research except that it had the volunteers were requested and over enough. The volunteers were the basis of their available meeting the possibility of matching personal still remained because of the large.

All the volunteers were administration Study, Wide Range California ideology questionnaires. C sheet data about the individuals nated as subjects. The time scheme allow for further shifting of subject.

The next step was to match 1 meeting together, was told, "You man relations experts. As experts
GROUP DYNAMICS

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THE EFFECTS OF COOPERATION AND COMPETITION

PART II

An Experimental Study of the Effects of Cooperation and Competition upon Group Process

The Experimental Design

In setting up the experimental test the hypotheses it was necessary to have the following: (a) intelligent and reasonably well-adjusted subjects who would regularly attend experimental sessions over a period of time; (b) some degree of control over the goals the subjects strove for (to be able, through manipulations of these goals, to place the subjects in cooperative or competitive situations); and (c) a readily observable situation.

The somewhat unorthodox Introductory Psychology course offered by the Industrial Relations Section at the Massachusetts Institute of Technology appeared to provide the needed conditions. Through the excellent cooperation of the Industrial Relations Section, it became possible to make the experimental sessions an integral part of the course. Regular attendance was thus assured. The experimenter-instructor's control over grades and assignments also provided the needed degree of control over the goals of the subjects.

At the first meeting of the various sections, it was announced that the department was interested in doing research on the course and wanted to form some small sections to be composed of five students and one instructor. These sections would meet once weekly as a substitute for the regularly scheduled three one-hour meetings. Nothing was stated about the research except that it had the purpose of improving the course. Volunteers were requested and over 50 were obtained, which was more than enough. The volunteers were then formed into 10 tentative groups on the basis of their available meeting times. Though this very much limited the possibility of matching personalities as well as groups, some flexibility still remained because of the large overlappings of time schedules.

All the volunteers were administered the following tests: The A-S Reaction Study, Wide Range Vocabulary Test, and the University of California ideology questionnaires. On the basis of these tests and other file sheet data about the individuals, the most deviant students were eliminated as subjects. The time schedules of the remaining subjects did not allow for further shifting of subjects from group to group.

The next step was to match pairs of groups. Each group, at its first meeting together, was told, "You are to be constituted as a board of human relations experts. As experts, each week you will be presented a hu-
man relations problem. Your job is to analyze and discuss the problem and to formulate, in letter form, some written recommendations." They were then given a human relations problem having to do with a question of discipline in a children’s camp. A total of 50 minutes for the discussion and writing of recommendations was allowed. Each of the groups was rated by the experimenter on a nine-point scale in terms of the productivity of their discussion of the problem. Groups were then paired off in terms of these ratings, and by a random procedure one of each pair was assigned to the cooperative treatment and the other to the competitive treatment.

Experimental Procedures

Instructions designed to produce the cooperative or the competitive situation were given at the beginning of the second meeting to the appropriate groups. The two sets of instructions are presented below.5

Instructions to Cooperative Groups

Puzzle problems. Every week you will be given a puzzle to solve as a group. These puzzles are, in effect, tests of your ability to do clear, logical thinking as a group. Your effectiveness in handling the problem will be evaluated by ranking you as a group in comparison with four other groups who will also tackle the same problems. Each of the five groups will be ranked. The group that works together most effectively will receive a rank of 1, the next most effective group will receive a rank of 2, the least effective group will receive a rank of 5. The ranks that each group receives on the weekly problems will be averaged. At the end of it all, we should be able to have a pretty good picture of each group’s ability to do clear, logical thinking.

To motivate you to contribute your best efforts, we will have a reward. The group that comes out with the best average will be excused from one term paper and will receive an automatic H for that paper. That is, if your group receives the highest rank, all of you will receive an automatic H.5

You are to come out with one solution as a group. When you have decided as a group that you have reached a solution, let me know by handing me your answer written on this answer sheet.

Human relations problems. There are two principal factors determining your grade for this course: (a) the discussions in class of the human relations problems, and (b) the papers you hand in periodically.

Your grade for the discussions in class will be determined in the following manner:

Each week the plans or recommendations that the group comes out with as a result of discussion will be judged and evaluated by ranking them in comparison

The Effects of Cooperation

with the efforts of four other similar recommendations are judged to be 1 ideas) will receive a rank of 1, the worst group will receive a rank of 5.

Every member of the group will That is, all members of a group will determine by how good their group dis The ranks that are received will part of the grade which is based

Thus, in effect, you are to consider problems presented to you weekly determined by your ability to effecti the group whose discussions at quantity will get the highest grades. The worst grade will get the low.

In this meeting, as in all the others, a board of human relations experts. following problem which I will read the problems as you read, if you wish to de

You will be allowed a total of 50 ing of recommendations. You are to on this form which I have provided.

You will be notified when you hav left.

Instructions to Competitive Group

Puzzle problems. Every week you These puzzles are, in effect, tests of thinking. The contributions that each will be ranked, so that the person receiv e a rank of 1, the one who contrib The one who contributes least will you receive on the weekly problems should have a pretty good picture of thinking.

To motivate you to contribute a reward for the individual who com is excused from one term paper and will

You are to come out with one sol a group that you have reached a so answer written on this answer sheet.

Human relations problem. There grade for this course: (a) the discu (b) the papers you hand in

Your grades for the discussion in manner:

Each week the contributions that recommendations that the group comes out so that the individual contributing

5 "Pure" cooperative and competitive situations were not created by the instructions. Other goals related to such needs as recognition and affiliation, made it possible for these instructions to produce only relative differences of cooperation and competitiveness.

6 An H at M.I.T. is the highest grade obtainable.
Group Dynamics

aly ze and discuss the problem written recommendations." They
m having to do with a question of 50 minutes for the discussion
lved. Each of the groups was n scale in terms of the product-
Groups were then paired off in procedure one of each pair was
d the other to the competitive

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cooperative or the competitive
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iven a puzzle to solve as a group. y to do clear, logical thinking as a
elem will be evaluated by ranking 10 groups who will also tackle the
be ranked. The group that works f 1, the next most effective group
up will receive a rank of 5. The problems will be averaged. At the
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forts, we will have a reward. The
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The Effects of Cooperation and Competition

with the efforts of four other similar groups. The group whose discussions and
recommendations are judged to be best (in terms of both quality and quantity of
ideas) will receive a rank of 1, the next best group a rank of 2, and so on; the
worst group will receive a rank of 5.

Every member of the group will be given the rank that his group receives.
That is, all members of a group will receive the same rank, the rank being deter-
m ined by how good their group discussions and recommendations are.

The ranks that are received weekly will be averaged and used in making up
that part of the grade which is based on class discussion.

Thus, in effect, you are to consider the discussions of these human relations
problems presented to you weekly as a test in which your group rank or grade is
determined by your ability to effectively apply insights to these problems. Remember,
the group whose discussions and recommendations are best in quality and
quantity will get the highest grade; the group whose discussions and recom-
mendations are worst will get the lowest grade.

In this meeting, as in all the other meetings, you will consider yourself to be
a board of human relations experts. As such, you have been presented with the
following problem which I will read to you. You may glance at your copies of the
problem as I read, if you wish to do so. (The problem was then read by the ex-
perimenter.)

You will be allowed a total of 50 minutes for both the discussion and the writ-
ing of recommendations. You are to write your recommendations in letter style,
ons this form which I have provided.

You will be notified when you have only 20 minutes, 10 minutes and 5 minutes
left.

Instructions to Competitive Groups

Puzzle problems. Every week you will be given a puzzle to solve as a group.
These puzzles are, in effect, tests of your individual abilities to do clear, logical
thinking. The contributions that each of you make to solving the weekly puzzle
will be ranked, so that the person who contributes most to the solution will re-
eive a rank of 1, the one who contributes next most will receive a rank of 2, etc.
The one who contributes least will receive a rank of 5. The ranks that each
you receive on the weekly problems will be averaged. At the end of it all, we
should have a pretty good picture of each individual's ability to do clear, logical
thinking.

To motivate you to contribute your best individual efforts, we will have a
reward for the individual who comes out with the best average. He will be ex-
cused from one term paper and will receive an automatic H for that paper.

You are to come out with one solution as a group. When you have decided as
a group that you have reached a solution, let me know by handing me your
answer written on this answer sheet.

Human relations problem. There are two principal factors determining your
grade for this course: (a) the discussions in class of the human relations prob-
lems, and (b) the papers you hand in periodically.

Your grades for the discussion in class will be determined in the following
manner:

Each week the contributions that each of you makes to the plan of recom-
mendations that the group comes out with as a result of discussion will be ranked
so that the individual contributing the most (in terms of both quality and
quantity of ideas) to the group plan will receive a rank of 1, the individual contributing next most will get a 2, and so on; the individual who contributes least will get a 5.

The ranks that each individual receives from week to week will be averaged and will be used in making up that part of his grade which is based on class discussion.

Thus, in effect, you are to consider the discussions of these human relations problems presented to you weekly as a test, in which each of you is being ranked and graded on your individual ability to effectively apply insight to these problems. Remember, the individual who contributes most in quality and quantity to the discussions and recommendations will get the highest grades; the individual who contributes least will get the lowest grades.

In this meeting, as in all the other meetings, you will consider yourself to be a board of human relations experts. As such, you have been presented with the following problem which I will read to you. You may glance at your copies of the problem as I read, if you wish to do so. (The problem was then read by the experimenter.)

You will be allowed a total of 50 minutes for both the discussion and the writing of recommendations. You are to write your recommendations in letter style, on the form which I have provided.

You will be notified when you have only 20 minutes, 10 minutes, and 5 minutes left.

The cooperation of the subjects in not discussing problems and procedures outside of the group meetings was solicited. The same instructions were repeated at each group meeting. Subjects in both the cooperative and competitive groups were not informed about their weekly grades until the end of the experiment.

During the five weeks of experimentation, each of the groups met once weekly for a period of approximately three hours. The schedule of a meeting was as follows: (a) The experimenter read the appropriate instructions for the puzzles. (b) The group undertook the solution of the puzzle. (c) The students filled out a brief questionnaire while the observers made various ratings. (d) The experimenter read the appropriate instructions for the human relations problem. (e) The group was allowed a total of 50 minutes for the discussion and writing of recommendations. (f) The students then filled out a lengthy questionnaire. (g) There was a 10-15 minute break. (h) The rest of the three hours the experimenter lectured, encouraging active discussion, on psychological principles such as are involved in “need theory,” “level of aspiration,” and “conflict.”

Each of the 10 groups received the same informal lectures in any given week.

It should be clear that the discussion and solution of both the puzzles and the human relations problems were undertaken by the various groups without the participation of the experimenter-instructor. During these discussions he sat at a table with the other observers and functioned as an observer.

**The Effects of Cooperation**

It should be emphasized that three-hour meetings by the experimental group were the only meetings that were directed toward cooperation. The experimenter-instructor tried to create a cooperative group atmosphere which all groups.

**The Problems**

The background consideration of the problems was that problems be used as a means to an end. It was thought that it was feasible to confront the group with problems of a nature that were tasks in which the group could make progress; they are consensus tasks which can be solved by group effort. The puzzle problems were included for purposes of comparison. The cooperative groups were able to solve problems with relative ease. The content of the puzzle problems is of little importance. The content of the human relations problems is the primary consideration.

It is possible that the sequence might influence the results obtained. With the limited time available for the experiment, the Latin-square design was used to vary the sequence in which the different conditions were presented and to compare the effectiveness of the different treatment groups.

**Measures Used by the Observer**

For most of the experiment the observer, a graduate student, was assigned to the groups. The observers made occasional participation of the group, but were not a part of the discussion. The observer was able to stay in contact with the group and to observe the group’s behavior. The observer was able to categorize each participation of the group. (a) He observed the number of times the observer asked a question, (b) the number of times the participant asked a question, (c) the number of times the participant gave an answer, (d) the number of times the participant gave a suggestion, (e) the number of times the participant gave a critique. The observer was able to observe the number of times the group engaged in conflict, (a) the number of times the group engaged in conflict, (b) the number of times the group engaged in cooperation, (c) the number of times the group engaged in competition, (d) the number of times the group engaged in discussion. The observer was able to observe the number of times the group engaged in discussion, (a) the number of times the group engaged in discussion, (b) the number of times the group engaged in cooperation, (c) the number of times the group engaged in competition, (d) the number of times the group engaged in discussion.
The Effects of Cooperation and Competition

It should be emphasized that the only differences introduced into the three-hour meetings by the experimenter-instructor were the differences in instructions read to the cooperative and competitive groups. The experimenter-instructor tried to create a friendly, informal, but impersonal relationship with all groups.

The Problems

The background considerations previously outlined dictated that human relations problems be used as group tasks. In addition, for comparative purposes, it was thought that it would be interesting to have the groups confronted with problems of a rather different type. The human relations problems are tasks in which there are no clearly discernible objective criteria of locomotion; they are tasks in which the group itself, through consensus, provides the criteria for judging locomotion. In addition, the content of these problems is likely to evoke strongly-held personal value systems. The puzzle problems were, for convenience, chosen for contrast. Due to their objective (i.e., logically demonstrable) solutions, locomotion could take place without group consensus. This, of course, provided the possibility for relatively more individual work in the puzzles than in the human relations problems. The relative lack of ideological relevance of the content of the puzzle problems also made conflict more likely in the human relations problems.

It is possible that the sequence in which the problems were presented might influence the results obtained. Care was taken, therefore, to control this influence. With the limited number of subjects and groups available it was decided that a latin-square design would be most appropriate. This design makes it possible to vary systematically from group to group the sequence in which the different problems were presented. It permits the effective elimination and estimation (by statistical methods) of the effect of differences among groups, due to the effect of sequence in which the problems are presented, and the effect of different kinds of problems.

Measuring Instruments

Instruments Used by the Observers

For most of the experiment there were four observers. Two major tasks, among others, were assigned to the different observers.

1. The Functions Observations Sheet. The job of the observer was to categorize each participation of the members in terms of the following: (a) who spoke (or gestured), (b) to whom the remark was addressed, (c) the intent of the participant, and (d) the length of the participation. Arbitrarily it was decided to use the utterance to define a unit of par-
participation, with the exception that if more than one function distinctly occurred in any utterance two or more categorizations would be made. To provide the possibility of cross-analysis with other instruments, a new functions sheet was used for each five-minute period. To facilitate tabulation no attempt was made to retain sequence of utterances or the linkage "who-to-whom."

The categories used in the Functions Observation Sheet were divided into three broad groupings: 5

Task functions include participations which are directed toward the task with which the group is confronted. These functions have as their immediate purpose the facilitation of problem solution. Included in this grouping are such functions as "initiator-contributor," "information-giver," "position-stater," "elaborator," "coordinator," "orientor," "evaluator-critic," "energizer," and "information-seeker."

Group functions include participations which are directed toward the functioning of the group. They have for their immediate purpose the maintenance, strengthening, regulation, or perpetuation of the group. Included here are such functions as "encourager-rewarder," "harmonizer-mediator," "good group member," "gate-keeper," "standard-setter," "follower," and "group observer."

Individual functions include participations which are directed toward the satisfaction of the participant’s individual needs. They have for their immediate purpose the reaching of an individual goal which is neither task nor group relevant. The goal is individual in the sense that the satisfaction aimed at by the participant cannot be participated in by the others, either at all or in the same way. Such functions are grouped here as "play-boy," "sympathy-seeker," "aggressor," "dominator," "blocker," "recognition-seeker," "self-defender," and "self-observer."

The observer, using this instrument, was trained for approximately 30 hours before observing the experimental group meetings.

2. The over-all rating scales. These are a series of nine-point rating scales which were rated by each observer at the end of each problem. They covered such things as group-discussion productivity, group orientation, self-centeredness, involvement, communication difficulties, attentiveness, and acceptance-rejection. All the rating scales apply to the entire discussion of any given problem.

In considering the various ratings, we should keep in mind that it was impossible to maintain any absolute standards. The ratings more or less

5 This classification was developed by the present author in conjunction with this research project. It was also used by the National Training Laboratory in Group Development and was the basis for an article appearing under the authorship of Benne and Sheats (2). For fuller description of this system of classification, see the article by Benne and Sheats.

The Effects of Cooperation presumed a standard of judge introspective psychology to be primarily on the direction of size of differences between the

The results themselves give instruments have sufficient reliability of the observations as determined from the results. One with respect to the validity of possible bias among the observers see the cooperative groups as any significant results might be than of real differences.

There is no simple way to throw dispositions. However, two kind observers did not bias their observations about cooperation and competitive statements to the effect that, if in mind, they would have a better observations. (b) The second but the, quite convincing. Data with the results from data collected to suspect the subjects of bias (was about), this is good indication

Instruments Used by the Subjec

1. The Weekly Questionnaire the human relations problems, items on the questionnaire core which roughly paralleled those in addition to such scales as at least acceptance-rejection, the subjects group cooperation, group produced anticipated reactions of the others.

2. The Post-experimental Que- perimental group meeting, the covering a range of topics. The things as (a) when first and last na

5 The observers were never informed investigates.

6 Due to unavoidable circumstance cooperative groups, totaling 19 subje subjects.
Group Dynamics

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ite period. To facilitate tabula-
tance of utterances or the linkage

observation Sheet were divided
which are directed toward the
These functions have as their
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ger-rewarder,” “harmonizer-
eeper,” “standard-setter,” “fol-
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not be participated in by the
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or,” “dominator,” “blocker,”
self-observer.”
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group meetings.
are a series of nine-point rating
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ard. The ratings more or less
ent author in conjunction with this
al Training Laboratory in Group
aring under the authorship of Benne
m of classification, see the article by

The Effects of Cooperation and Competition

presumed a standard of judgment based on experience with groups of
introductory psychology students. Thus, the emphasis throughout will
be primarily on the direction of the obtained differences rather than on
size of differences between the two types of groups.

The results themselves give prima-facie evidence that the observing
instruments have sufficient reliability for many of the present purposes. The
validity of the observations and ratings, however, cannot be directly
determined from the results. One of the primary questions that may arise
with respect to the validity of the observations may be concerned with a
possible bias among the observers. Thus, if the observers were disposed to
see the cooperative groups as being better than the competitive groups,
any significant results might be a reflection of this predisposition rather
than of real differences.

There is no simple way to insure that the observers had no such pre-
dispositions. However, two kinds of evidence support the belief that the
observers did not bias their observations in terms of any preconceptions
about cooperation and competition: *(a) The observers made impromptu
statements to the effect that, if they were allowed to keep the instructions
in mind, they would have a better interpretive frame of reference for their
observations. *(b) The second kind of evidence is indirect but, never-
theless, quite convincing. Data collected from the subjects strongly agree
with the results from data collected by observers. Since there is no reason
to suspect the subjects of bias (they did not know what the experiment
was about), this is good indication of lack of bias in the observers.

Instruments Used by the Subjects

1. The Weekly Questionnaire. At each meeting after the discussion of
the human relations problems, the subjects filled out a questionnaire. The
items on the questionnaire consisted for the most part of rating scales
which roughly paralleled those in the observers’ Over-all Rating Scales. In
addition to such scales as attentiveness, communication difficulties, and
acceptance-rejection, the subjects rated interest, group-feeling, amount of
group cooperation, group productivity, individual productivity, and antici-
pated reactions of the others to their own contributions.

2. The Postexperimental Questionnaire. One week after the last ex-
perimental group meeting, the subjects filled out a lengthy questionnaire
covering a range of topics. The questionnaire attempted to get at such
things as *(a) when first and last names were learned; *(b) amount and kinds

The observers were never informed by the experimenter of the hypotheses being
investigated.
Due to unavoidable circumstances, this questionnaire was given to only four
cooperative groups, totaling 19 subjects, and four competitive groups, totaling 20
subjects.
of social activities mutually engaged in by group members outside of class hours; (c) reactions to the small group meetings, the instructor, and the course; (d) the importance of different factors in motivating the subjects to achieve during the solution of the problems; (e) reaction to the grading system; and (f) reaction to being observed.

**Experimental Results**

**Effectiveness of Instructions**

It is perhaps important to start out by inquiring about the reactions of the subjects to the two different sets of instructions. Clearly, if the instructions never "got over," one could reasonably question their efficacy in producing differences.

All subjects, when requested (D) to "describe the method by which you were being graded on the human relations problems," responded with an appropriate description. That is, each subject understood and could recall the essentials of the instructions.

In answer to the question (D), "If you had had completely free choice as to the method of grading discussion in class, which would you have preferred?" the following results were obtained:

<table>
<thead>
<tr>
<th>Grading Method Preferred</th>
<th>Cooperative</th>
<th>Competitive</th>
<th>No Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>By Indiv coop</td>
<td>11</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>By Indiv comp</td>
<td>6</td>
<td>11</td>
<td>3</td>
</tr>
</tbody>
</table>

Assuming these differences did not exist at the beginning of the experiment, one can conclude that roughly the same percentage of individuals were satisfied with the method of grading to which they were exposed.

Clearly, then, the instructions "got over" to the subjects in both kinds of groups and in such a way as to seem satisfactory to approximately the same percentage in both groups.

**Perceived Interdependence**

Hypothesis I asserts that Indiv coop will perceive themselves to be more promotively interdependent than will Indiv comp. Table 23.1 presents some relevant data.

Group-centeredness (we-feeling) was rated by the observers to be considerably higher in the cooperative groups for both the puzzles and the human relations problems. The ratings of the subjects, in the questionnaire pertaining to the human relations problems, give the same results.

*From this point on, (A) will refer to the Over-all Rating Scales, (B) to the Functions Observations Sheet, (C) to the Weekly Questionnaire filled out by subjects, and (D) to the Postexperimental Questionnaire.

**The Effects of Cooperation**

Indiv coop give themselves more comp. These differences with feeling are significant at the 1% levels problems. Thus, the null hypothesis (perceived promotive

**Differences between Cooperativ to Hypothesis of Perceived P**

<table>
<thead>
<tr>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-centeredness (A)</td>
</tr>
<tr>
<td>Group-centeredness (A)</td>
</tr>
<tr>
<td>Group-feeling (C)</td>
</tr>
<tr>
<td>Competitiveness (C)</td>
</tr>
<tr>
<td>Desire to excel others (D)</td>
</tr>
<tr>
<td>Desire to excel others (D)</td>
</tr>
</tbody>
</table>

*The differences for three of the pairs are in (A) have p values of .01, .01, and .13 respectively. Two of these differences have p value of .14 and .20.

The second part of the hypothesis to be more counter-intuitively inferred supported by the same evidence. The evidence were rated to be more self-centered comp rated themselves as being "Perceived contrient interdependence to "self-centered," the measure this component, the human relations problem, "How in your group did you feel you were supported by the fact that they felt that much did you desire to excel others," significant differences were.

*The following symbols are being used: Human Relations problems: (A), (B), (footnote 8). Total of all data was average of between each of the five pairs group differences indicated the cooperative or competitive groups. Total $p = p$ of the five pairs. A combined value is $p$ for all five pairs is the same as that of 1.
GROUP DYNAMICS

by group members outside of meetings, the instructor, and factors in motivating the students: (c) reaction to the observed.

RESULTS

inquiring about the reactions of the class. Clearly, if the instruc-

tively question their efficacy in describing the method by which you problems,” responded with an ect understood and could recall

had had completely free choice in class, which would you have

ied:

Competitive  No Preference

6  2

11  3

at the beginning of the experiment, the same percentage of individuals to which they were exposed.

c to the subjects in both kinds of class, to approximately the

I perceive myself to be more Indiv. coop. Table 23.1 presents

ted by the observers to be comparable for both the puzzles and the of the subjects, in the questionnaire, problems, give the same results.

at-all Rating Scale, (B) to the Functionnaire filled out by subjects, and

THE EFFECTS OF COOPERATION AND COMPETITION

Indiv. coop give themselves credit for more “group feeling” than do Indiv. coop. These differences with respect to group-centeredness and group feeling are significant at the 1% level for both the puzzles and human relations problems. Thus, the evidence gives support to the first part of the hypothesis (perceived competitive interdependence).

TABLE 23.1

DIFFERENCES BETWEEN COOPERATIVE AND COMPETITIVE GROUPS ON DATA RELEVANT TO HYPOTHESES OF PERCEIVED PROMOTIVE AND CONTRIBUTIVE INTERDEPENDENCE

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>PROBLEM TYPE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M diff</td>
<td>p</td>
</tr>
<tr>
<td>Group-centeredness (A)</td>
<td>H. R.</td>
<td>+2.98</td>
</tr>
<tr>
<td>Group-centeredness (B)</td>
<td>P</td>
<td>+2.54</td>
</tr>
<tr>
<td>Group-feeling (C)</td>
<td>H. R.</td>
<td>+1.20</td>
</tr>
<tr>
<td>Competitiveness (C)</td>
<td>H. R.</td>
<td>~.37</td>
</tr>
<tr>
<td>Desire to excel others (D)</td>
<td>H. R.</td>
<td>~2.30</td>
</tr>
<tr>
<td>Desire to excel others (E)</td>
<td>P</td>
<td>~2.20</td>
</tr>
</tbody>
</table>

*The differences for some of the pairs are in the same direction as the total mean difference; these differences have p values of .01, .05, and .10 respectively. The differences for the other two pairs are in an opposite direction; these differences have p values of .14 and .23.

The second part of the hypothesis (Indiv. coop will perceive themselves to be more competitively interdependent than will Indiv. coop) is partly supported by the same evidence. Thus, the competitive group members were rated to be more self-centered by the observers. Likewise, Indiv. coop rated themselves as being more self-oriented than did Indiv. coop.

"Perceived contributive interdependence," however, seems to include, in addition to "self-centeredness," the notion of "I" versus "the others." To measure this component, the subjects were asked (C), in reference to the human relations problem, "How competitive with the other members in your group did you feel you were, during the discussion?"

The results obtained here are not so conclusive, though they tend to support the hypothesis (see Table 23.1, competitiveness). It seems probable that the lack of clean-cut results is a reflection of the differing interpretations placed on the word competitiveness by Indiv. coop. This interpretation is supported by the fact that when the question was phrased, "How much did you desire to excel others?" on the Post-experimental Questionnaire, significant differences were obtained in the predicted direction.

*The following symbols are being used in the various tables: P = Puzzles; H. R. = Human Relations problems; (A), (B), (C), or (D) = the measuring instrument (see footnote H); Total M diff = average of the differences (cooperative minus competitive) between each of the five paired groups for each of the five experimental weeks. A plus sign indicates that the competitive groups had more of the variable than did the competitive groups. Total p = the p value obtained by combining the p values for each of the five pairs. A combined value is given only when the direction of the differences for all five pairs is the same as that of the total mean difference.
To sum up, the data support the predictions that perceived promotive interdependence would be greater among Indiv coop and that perceived centrifugal interdependence would be greater among Indiv comp.\footnote{We propose in our theoretical discussion that Indiv coop has greater unity as a sociological group than does Indiv comp. Also, psychological unity as a group, cohesiveness of a group, and strength of membership motives were defined to be direct functions of the degree of perceived promotive interdependence. Thus, it is possible to state the results here more positively. The data support the hypothesis that a sociological group with greater unity will possess more psychological unity than a sociological group with lesser unity. In further comparisons of Indiv coop and Indiv comp, one should keep in mind the possibility of making similar more general statements.}

**Organization**

Coordination of efforts. Hypothesis 6 asserted that there would be greater degree of coordination of efforts and that coordination would occur more frequently among Indiv coop than among Indiv comp. Table 23.2 presents the relevant evidence.

**TABLE 23.2**

**DIFFERENCES BETWEEN COOPERATIVE AND COMPETITIVE GROUPS ON DATA RELEVANT TO THE HYPOTHESIS CONCERNING COORDINATION OF EFFORT**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>PROBLEM TYPE</th>
<th>TOTAL</th>
<th>M diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working-together (A)</td>
<td>H. R.</td>
<td>+2.42</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Working-together (A)</td>
<td>P</td>
<td>+2.68</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Degree of coordination (A)</td>
<td>H. R.</td>
<td>+2.62</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Degree of coordination (A)</td>
<td>P</td>
<td>+2.57</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Group cooperation (C)</td>
<td>H. R.</td>
<td>+1.38</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>

The observers rated that the cooperative groups worked together more frequently (A) and were more highly coordinated (A) than were the competitive groups. In answer to the question (C), "How cooperatively did the group work together on this problem?" the ratings of Indiv coop indicated more working together than did the ratings of Indiv comp.

Thus the data give rather definite support to the coordination hypothesis.

**Homogeneity of participation.** Hypothesis 7 states that there will be less homogeneity with respect to amount of contribution among Indiv coop than among Indiv comp. The data presented in Table 23.3 provide the evidence relevant to this hypothesis. The variance in amount of contributions among members has been used as the measure of homogeneity. The differences between variances of paired groups were then entered as scores in the latin square and the customary statistical treatment was made.

The data give support for a concluding. In both the puzzle greater homogeneity of partici of the five pairs in the human in the puzzles go in the direct.

Further support is given that are directly relevant to the basic Questionnaire the subjects were not offering suggestions or the sons checked by Indiv coop, pretty much the same thing."

Thus, though the results at hypothesis that there will be revolution among Indiv coop than an

**Specialization.** A cursory inspection of Observations Sheets reveal Hypothesis 8 (specialization tests that were made the data with respect to all functions of functioning within groups).

The evidence relevant to activity (Hyp. 9) is much more. The results definitely indicate letter of recommendations, all there were significantly more active groups. Faced with the time, cooperative members were permitted the members to divide allowed the various members largely. In the competitive situa
 asserted that there would be
and that coordination would oc-
 happen among Indiv coop. Table

THE EFFECTS OF COOPERATION AND COMPETITION

TABLE 23.3
Differences in Homogeneity of Amount of Participation between Cooperative and Competitive Groups

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>PROBLEM TYPE</th>
<th>M DIFF</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homogeneity of participation (B)</td>
<td>H. R.</td>
<td>-2593</td>
<td>*</td>
</tr>
<tr>
<td>Homogeneity of participation (B)</td>
<td>P</td>
<td>-518</td>
<td>.16</td>
</tr>
</tbody>
</table>

*The differences for four of the pairs are in the same direction as the total mean difference; these differences have p-values of .05, .07, .13, and .67 respectively. The pair going in the opposite direction has a p-value of .16.

The data give support for the hypothesis, although the results are not conclusive. In both the puzzles and human relations problems, there is greater homogeneity of participation within competitive groups. Four out of the five pairs in the human relations problem and all of the five pairs in the puzzles go in the direction predicted by the hypothesis.

Further support is given by some additional data which are directly relevant to the basic substitutability hypothesis. On the Weekly Questionnaire the subjects were asked to indicate the reasons they had for not offering suggestions or thoughts to the group discussion. Of the reasons checked by Indiv coop, 47% were in the category "Somebody else said pretty much the same thing," compared to 33% for Indiv comp.

Thus, though the results are not conclusive, support is given to the hypothesis that there will be more homogeneity in amount of participation among Indiv coop than among Indiv comp.

Specialization. A cursory inspection of the data collected on the Functions Observations Sheets revealed a low reliability of the data needed to test Hypothesis 8 (specialization with respect to function). In the statistical tests that were made the data revealed no clear-cut significance (though with respect to all functions there is, on the average, greater specialization of functioning within cooperative groups than within competitive groups).

The evidence relevant to specialization with respect to content or activity (Hyp. 9) is much more clear-cut. Table 23.4 presents the data. The results definitely indicate that with respect to the job of writing the letter of recommendations, asked for in the human relations problems, there were significantly more instances of division of labor in the cooperative groups. Faced with the problem of achievement in a limited amount of time, cooperative members were able to organize themselves so as not to duplicate one another's efforts. Substitutability of one for the other permitted the members to divide up the job into its different aspects and allowed the various members to work on these components simultaneously. In the competitive situation, writing procedure generally followed...
TABLE 23.4

AVERAGE NUMBER OF PERSONS SIMULTANEOUSLY ENGAGED IN WRITING RECOMMENDATIONS FOR THE DIFFERENT HUMAN RELATIONS PROBLEMS IN COOPERATIVE AND COMPETITIVE GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Barber Shop</th>
<th>Cheating</th>
<th>WWII Vet</th>
<th>Negro Workers</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coop*</td>
<td>1.8</td>
<td>2.4</td>
<td>2.0</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Comp</td>
<td>1.2</td>
<td>1.0</td>
<td>1.2</td>
<td>1.8</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* In none of the 25 paired experimental trials were there more members simultaneously engaged in writing in a cooperative group than in its paired competitive group. In twenty of the sessions there were more members in cooperative groups engaged in simultaneous writing; in the remaining nine sessions there were no differences between the paired groups.

† For all problems, but the Supervisors, only three persons could write simultaneously; it was possible for four persons to write simultaneously on this one.

either of two extremes: (a) One man was assigned the job, usually on the basis of a rotation scheme, and the other members took an active part in supervising the writing. The getting of ideas into written form was seen as a path, thus everyone was actively concerned with what was being written. Since the number of pages, always less than five, prevented the possibility of any compromise—"we each do one"—it was necessary for all to focus on the same activity. As a consequence, it was rare that two members were writing simultaneously. When two or more recorders are shown in the competitive groups, their time of writing did not overlap much. (b) A conscientious member took the form and wrote up recommendations while the others discussed. The discussants showed no interest in the write-up, never examining it, their whole attention being directed to the discussion. The written product was, more or less, considered to be an irrelevant side issue for some conscientious soul to handle. It was not seen as a necessary path, thus it was perfectly permissible for anyone who wished to do so to take over the function of writing.

Motivation

Hypothesis 12 asserts that the directions of the forces operating on Indiv coop should be more similar than the directions of the forces on Indiv comp. If this hypothesis is correct, one should expect greater speed in group locomotion for the cooperative groups. The data with respect to locomotion are presented under the heading of Productivity below. The data give strong support to the hypothesis.

The validity of the hypothesis presupposes the validity of the basic hypothesis with respect to positive inducibility. The following questions (C), "How did you react to the ideas or suggestions of others?" and "How frequently was your own thinking or reaction affected by what the others were saying?" are relevant. Table 23.5 indicates that Indiv coop were

THE EFFECTS OF COOPERATIVE

affected by the ideas of other comp. Table 23.7 indicates, it agreeable and acceptant Iowa sets of facts provide direct su to positive inducibility and it

DIFFERENCES BETWEEN COOPERATIVE

to the 3

TABLE 23.7

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect of other's ideas</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement pressure A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement pressure A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength of motivation to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement to achieve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest (C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The differences for four of the five pairs have p values of .04, .13, .24, and .46. The p

From Hypothesis 13 one we sure for achievement in the c ones. The ratings of the obs significant differences in the problem. The direction of the line with the hypothesis, but Hypothesis 15 states that th or competitive situations which of force operating on individ volvement is considered to be a relevant forces. The data of jecting the hypothesis. The competitive groups with respect to hand were negligible.

Communication

Hypotheses 16 and 17 assert cooperative as contrasted with smaller for the human relation puzzles. The relevant data are


GROUP DYNAMICS

ENGAGED IN WRITING RECOMMENDATION PROBLEMS IN COOPERATIVE AND COMPETITIVE CONDITIONS

<table>
<thead>
<tr>
<th></th>
<th>Negro Workers</th>
<th>Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>1.2</td>
<td>1.8</td>
<td>1.2</td>
</tr>
</tbody>
</table>

In experiments on the effects of cooperation and competition, groups that were more conscientious and worked more closely together tended to produce more ideas and to be more effective. In the present study, cooperation meant that the members worked together on specific tasks, while competition involved working against each other to complete the same tasks. The results showed that cooperation was more effective in generating new ideas and promoting creativity.

The Effects of Cooperation and Competition

Aided by the ideas of others significantly more often than were Indiv coop. Table 23.7 indicates, further, that Indiv coop were markedly more agreeable and acceptable towards the ideas initiated by others. These two sets of facts provide direct support for the basic hypothesis with respect to positive inducibility and indirect evidence for Hypothesis 12.

TABLE 23.5

DIFFERENCES BETWEEN COOPERATIVE AND COMPETITIVE GROUPS ON DATA RELEVANT TO THE MOTIVATION HYPOTHESES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Problem Type</th>
<th>M diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect of other's ideas (C)</td>
<td>H. R.</td>
<td>+ .78</td>
<td>.001</td>
</tr>
<tr>
<td>Achievement pressure (A)</td>
<td>H. R.</td>
<td>+1.00</td>
<td>.01</td>
</tr>
<tr>
<td>Achievement pressure (A)</td>
<td>P</td>
<td>+ .49</td>
<td>.*</td>
</tr>
<tr>
<td>Strength of motivation to achieve (D)</td>
<td>H. R.</td>
<td>+ .83</td>
<td>.01</td>
</tr>
<tr>
<td>Strength of motivation to achieve (D)</td>
<td>P</td>
<td>+ .20</td>
<td>not sig.</td>
</tr>
<tr>
<td>Involvement (A)</td>
<td>H. R.</td>
<td>+ .15</td>
<td>not sig.</td>
</tr>
<tr>
<td>Involvement (A)</td>
<td>P</td>
<td>+ .23</td>
<td>not sig.</td>
</tr>
<tr>
<td>Interest (C)</td>
<td>H. R.</td>
<td>− .10</td>
<td>not sig.</td>
</tr>
</tbody>
</table>

*The differences for four of the five pairs are in the same direction as the means differences; those differences have p values of .06, .23, .24, and .68. The p value for the pair going in the opposite direction is .66.

From Hypothesis 13 one would predict that there would be more pressure for achievement in the cooperative groups than in the competitive ones. The ratings of the observers and of the subjects both produce significant differences in the predicted direction for the human relations problem. The direction of the differences obtained for the puzzles is in line with the hypothesis, but the size of the differences is not significant.

Hypothesis 15 states that there is nothing inherent in the cooperative or competitive situations which should produce differences in the strength of force operating on individuals in the two situations. Interest or involvement is considered to be an operational measure of total situationally relevant forces. The data of Table 23.5 clearly provide no basis for rejecting the hypothesis. The differences between cooperative and competitive groups with respect to involvement or interest in the problems at hand were negligible.

Communication

Hypotheses 16 and 17 assert that the volume of participation of the cooperative as contrasted with the competitive groups will be (Hyp. 16) smaller for the human relations problems, and (Hyp. 17) greater for the puzzles. The relevant data are presented in Table 23.6.
TABLE 23.6
Differences in Participation Volume, Attentiveness, and Communication Difficulties between Cooperative and Competitive Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Problem Type</th>
<th>M diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation volume * (B)</td>
<td>H. R.</td>
<td>-22.8</td>
<td>†</td>
</tr>
<tr>
<td>Participation volume (B)</td>
<td>P</td>
<td>+118</td>
<td>.001</td>
</tr>
<tr>
<td>Attentiveness (A)</td>
<td>H. R.</td>
<td>+1.04</td>
<td>.01</td>
</tr>
<tr>
<td>Attentiveness (A)</td>
<td>P</td>
<td>+1.50</td>
<td>.001</td>
</tr>
<tr>
<td>Attentiveness (C)</td>
<td>H. R.</td>
<td>+.42</td>
<td>†</td>
</tr>
<tr>
<td>Communication difficulties (A)</td>
<td>H. R.</td>
<td>-1.94</td>
<td>.001</td>
</tr>
<tr>
<td>Communication difficulties (A)</td>
<td>P</td>
<td>-1.39</td>
<td>.01</td>
</tr>
<tr>
<td>Difficulty in communicating to others (C)</td>
<td>H. R.</td>
<td>-.81</td>
<td>.001</td>
</tr>
<tr>
<td>Difficulty in understanding others (C)</td>
<td>H. R.</td>
<td>-.67</td>
<td>.001</td>
</tr>
</tbody>
</table>

* Participation Volume has the meaning of Total Number of Participations per 45 minutes. Thus, all participation volumes are equal in terms of a square root scale.
† The difference for three pairs are in the same direction as the total mean difference; these differences have p values of .001, .04, and .001. The other two pairs go in the opposite direction; these differences have p values of .12 and .32.
‡ The differences for three pairs are in the same direction as the total mean difference; these differences have p values of .001, .04, and .72. The other two pairs, in the opposite direction, both have p values of .3.

The observers rated that there were significantly fewer communication difficulties among Indiv coop than among Indiv comp for both the human relations problems and puzzles. Further support for Hypothesis 19 is obtained from the subjects. In answer to the question (C), "Did you find that you had difficulty in getting your ideas across to others?" the ratings of Indiv coop expressed significantly less difficulty than did the ratings of Indiv comp. The same results were obtained in answers to the following question (C), "Did you find that you had difficulty in trying to follow or get the point of what the others were saying?" Thus, the competitive subjects experienced more difficulty with respect to the spread of common significations, both in the roles of communicators and communicatees.

Hypothesis 21 asserts that there will be more common appraisals of communications in the cooperative groups than in the competitive groups. Table 23.7 presents the evidence for the hypothesis.

The observers rate greater acceptance of one another's ideas in the cooperative groups than in the competitive groups in both kinds of tasks. The subjects' ratings also strongly support the hypothesis. In answer to the questions (C), "How did you react to the suggestions of others?" and "How did the others tend to react to your ideas or suggestions?" the ratings made by Indiv coop, as contrasted with those of Indiv comp, indicate both significantly more agreement with the ideas and suggestions of others and perception of more agreement from other group members.

Two categories on the Functions Observation Sheets, "evaluator-critic" and "follower," also provide some relevant data, although it should be kept in mind that both refer specifically related to the noti critic.” It probably contains some "follower" includes some it necessarily agreement. Nevertheless, differences between the human relations problems in interaction with respect to the puzzling significant.

Orientation

Hypothesis 23 asserts that there is with respect to position and d among Indiv coop. The relev

Table 23.8 presents the evidence for the hypothesis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation (A)</td>
<td></td>
</tr>
<tr>
<td>Orientation (A)</td>
<td></td>
</tr>
<tr>
<td>Orderliness (A)</td>
<td></td>
</tr>
<tr>
<td>Orderliness (A)</td>
<td></td>
</tr>
</tbody>
</table>
**Group Dynamics**

**Entiveness, and Communication and Competitive Groups**

<table>
<thead>
<tr>
<th>Problem Type</th>
<th>Total</th>
<th>M diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. R.</td>
<td>-22.8</td>
<td>†</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>+118</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>H. R.</td>
<td>+1.04</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>+1.50</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>H. R.</td>
<td>+.42</td>
<td>‡</td>
<td></td>
</tr>
<tr>
<td>H. R.</td>
<td>-1.94</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>-1.39</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>H. R.</td>
<td>-.81</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>H. R.</td>
<td>-.67</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>

(*significant differences per 45 minutes. Thus, all participa-

tions have the same mean difference; these differences have a
direction; these differences have p values of .05. The first
difference has a direction; these differences have p values of .05.)*

Keep in mind that both categories may contain a few items which are not

specifically related to the notion of *common appraisal*. Thus, "evaluator-
critic" probably contains some items which are positive evaluations and

"follower" includes some items which connote understanding but not

necessarily agreement. Nevertheless, for both categories there are significant
differences between the cooperative and competitive groups on the human

relations problems in the direction of the hypothesis. The differences
with respect to the puzzles are in the predicted direction but are not

significant.

**Orientation**

Hypothesis 28 asserts that there will be more commonality of perception

with respect to position and direction to the goal among *Indiv coop* than

among *Indiv comp*. The relevant data are presented in Table 23.8.

According to the observers' ratings the cooperative groups were sig-
nificantly more oriented ("aware of where they are and where they are

TABLE 23.8

<table>
<thead>
<tr>
<th>Variable</th>
<th>Problem Type</th>
<th>Total</th>
<th>M diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation (A)</td>
<td>H. R.</td>
<td>+1.70</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Orientation (A)</td>
<td>P</td>
<td>+1.92</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Orderliness (A)</td>
<td>H. R.</td>
<td>+1.99</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Orderliness (A)</td>
<td>P</td>
<td>+1.96</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>
going") than the competitive groups for both kinds of tasks. The hypothesis is also given indirect support by the observers' ratings which indicate that the cooperative groups were also significantly more orderly and systematic in their approach to the various problems.

**Productivity**

Hypothesis 24 asserts that, since speed of locomotion will be greater in cooperative groups, quantitative productivity per unit of time will be less in the competitive groups. The evidence in Table 23.9 provides striking support. Cooperative groups solve the puzzle problems more rapidly than do the competitive groups and they also produce more on the human relations problems (number of words written in the recommendations are taken as a crude measure of productivity).

Hypothesis 25 states that qualitative productivity will be higher for the cooperative groups. Clear support is given to this hypothesis by the observers' ratings of discussion productivity (Table 23.9) and by the judges' ratings of written recommendations for the human relations problems (Table 23.10). According to observer ratings, the discussions of the cooperative groups not only came out with more fruitful ideas for handling the problem presented to them, but also their group discussions showed more insight and understanding of the nature of the problem.

### TABLE 23.9

<table>
<thead>
<tr>
<th><strong>Variable</strong></th>
<th><strong>Problem Type</strong></th>
<th><strong>Total</strong></th>
<th><strong>M diff</strong></th>
<th><strong>p</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion productivity (A)</td>
<td>H. R.</td>
<td>+1.86</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Discussion productivity (A)</td>
<td>P</td>
<td>+1.90</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Discussion insight (A)</td>
<td>H. R.</td>
<td>+1.25</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Discussion insight (A)</td>
<td>P</td>
<td>+1.72</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Time per solution</td>
<td>P</td>
<td>−7.35</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Number of words in written product</td>
<td>H. R.</td>
<td>+299 words</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Average individual productivity (A)</td>
<td>H. R.</td>
<td>+.15</td>
<td>not sig.</td>
<td></td>
</tr>
<tr>
<td>Average individual productivity (A)</td>
<td>P</td>
<td>+.58</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>Learning from discussion (C)</td>
<td>H. R.</td>
<td>+.25</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Grades on term paper</td>
<td></td>
<td>+2.85</td>
<td>.18</td>
<td></td>
</tr>
</tbody>
</table>

* Differences for three pairs are in the same direction as the total mean difference; these differences have p values of .07, .07, and .35. The two pairs, in the opposite direction, have p values of .30 and .45.

### The Effects of Cooperation

being posed to them. These and group insight are significant.

Average individual productivity. Group productivity agreed upon and accepted as of average individual productivity of cooperative and competitive the puzzles, there is a different coop. The latter result is probably due to communication within coop less likely to stay in blind all

### Data Relevant to Hypothesis

<table>
<thead>
<tr>
<th><strong>Correlations among R</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Judges 1 &amp; 2</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Mean difference</td>
</tr>
<tr>
<td>+ 2.04</td>
</tr>
<tr>
<td>p</td>
</tr>
<tr>
<td>.001</td>
</tr>
</tbody>
</table>

Table 23.10 presents the different problems, as indicated, that there is a consider clear; that despite this there a cooperative and competitive.

Hypothesis 26 states that less than will Indiv comp. Table members in three of the five the discussion of the human members rate themselves.

The same kind of results is obtained by the individuals on individual sessions. The grades being cons paper handed in by all the of the experiment. Statistical the predicted direction but a
Group Dynamics

Kinds of tasks. The hypothesized differences in ratings which indicate more orderly and systematic learning.

Locomotion will be greater (minutes per unit of time will be less) in Table 23.9 provides the puzzle problems more

Computational Groups on Various Measures of Productivity

<table>
<thead>
<tr>
<th>Type</th>
<th>Total</th>
<th>M diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Words</td>
<td></td>
<td>+1.86</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+1.90</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+1.25</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+1.72</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-7.35</td>
<td>.01</td>
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<td></td>
<td></td>
<td>+299</td>
<td>.001</td>
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<tr>
<td>Minutes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>+.15</td>
<td>not sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+.58</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+.25</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+2.85</td>
<td>18</td>
</tr>
</tbody>
</table>

The Effects of Cooperation and Competition

being posed to them. These differences with respect to group productivity and group insight are significant for both kinds of tasks.

Average individual productivity must not be confused with group productivity. Group productivity ratings refer to the ideas that were agreed upon and accepted as a basis for action by the group. The ratings of average individual productivity show no significant difference for the cooperative and competitive groups on the human relations problems. For the puzzles, there is a difference approaching significance favoring Indiv coop. The latter result is probably explained by the fact that the greater communication within cooperative groups meant that individuals were less likely to stay in blind alleys for long periods of time.

Table 23.10 presents the ratings of each group for each of the five different problems, as made by three different judges. Although it is evident that there is a considerable unreliability in the ratings, it is also clear that despite this there are significant differences between the paired cooperative and competitive groups.

Hypothesis 26 states that Indiv coop will learn more from one another than will Indiv comp. Table 23.9 indicates that the cooperative group members in three of the five pairs rated themselves as learning more from the discussion of the human relations problem than did the competitive members rate themselves.

The same kind of results are obtained when one examines the grades obtained by the individuals exposed to each of the experimental conditions. The grades being considered were those obtained on the first term paper handed in by all the subjects. The paper was due on the final week of the experiment. Statistical analysis reveals that the differences are in the predicted direction but not statistically significant.

### Table 23.10

Data Relevant to Hypothesis That Qualitative Productivity Will Be Higher in Cooperative Groups

<table>
<thead>
<tr>
<th>Correlations among Ratings of Group Productivity by Three Judges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Judges 1 &amp; 2</td>
</tr>
<tr>
<td>.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Differences between Cooperative and Competitive Groups on Mean of Judges’ Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean difference</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*total mean difference; these differences have p on, have p values of .30 and .45. The word written in the recom-
Thus, the hypotheses predicting greater group productivity for the cooperative groups have received strong support from the data, but the evidence with respect to the hypothesis predicting greater learning for \textit{Indiv coop} is far from conclusive. It should be noted that the discussions took place at the very beginning of an introductory psychology course. Perhaps at such an early stage the subjects were not particularly ready to have cognitive changes induced by fellow members under either of the two conditions.

\textbf{Interpersonal Relations}

From the basic hypothesis with respect to cathexis, it was derived that \textit{Indiv coop} would be more friendly towards one another in the group meetings than would \textit{Indiv comp} (Hyp. 27). Table 23.11 presents the relevant data.

\begin{table}[h]
\centering
\caption{Differences between Cooperative and Competitive Groups in Friendliness, and Other Related Data}
\begin{tabular}{l|ll}
\hline
\textbf{Variable} & \textbf{Problem Type} & \textbf{Total} \\
\hline
Friendliness (A) & H. R. & +1.26 & .001 \\
Friendliness (A) & P & +.89 & .01 \\
How good were contributions of others (C) & H. R. & +.70 & * \\
Encourager (B) & H. R. & +.66 & f \\
Encourager (B) & P & +.20 & not sig. \\
Aggressor (B) & H. R. & −1.16 & .01 \\
Aggressor (B) & P & −.64 & not sig. \\
Time taken to learn last names (D) & H. R. & −.20 & .06 \\
Correctness of spelling of last names (D) & & +5.3 & .11 \\
\hline
\end{tabular}
\end{table}

\* Differences for four pairs are in the same direction as the total mean difference; these differences have \( \rho \) values of .005, .01, .01, and .07. The other pair, in the opposite direction, has a \( \rho \) value of .87.

\footnote{Differences for four pairs are in the same direction as the total mean difference; these differences have \( \rho \) values of .001, .08, .57, and .62. The other pair has a \( \rho \) value of .57.}

Observers’ ratings reveal that \textit{Indiv coop} were significantly more friendly than \textit{Indiv comp} during discussions of both types of problems. The hypothesis receives additional support from the observation of functions during discussion of the human relations problems. A greater percentage of encouraging or rewarding remarks was made in cooperative groups, and a significantly larger proportion of aggressive remarks was made in the competitive groups. The puzzle problems yielded such a low frequency of all emotionally laden functions that no significant differences could be established between groups.

\textbf{The Effects of Cooperation}

The cooperative subjects in the \textit{contributions of others} were better than did the competitive to indicate greater positive cathexis.

The next question of interpretation of the friendliness of the question (D), “How much do you feel in contrast with the other for you in contrast with the other in the only relevant measure, and the competitive group was more prominent in my mind than more prominent than most of the sessions were not especially for a little reason to expect much.

Various measures were takeings of fellow members with amount of friendly feeling a last names, correctness of spelling together in outside activities outside of class. Table 23.11

\textit{Indiv coop} learned one at \textit{comp} (as reported on the first another’s names more nearly significant \textit{at only} the 11\% level) and somewhat with regard to learning outside activities undertaken \textit{Indiv coop} rated themselves higher than did \textit{Indiv coop}. These ratings were not statistically significant. The data on cathexis occurred. The relative to the relative lack of improvement and \textit{b} strong restraint increased sociability which in situation.

Hypothesis 28 states that \textit{b} more highly by \textit{Indiv coop} the relevant data. In answer to the thinking?” the ratings reveal the operative than among the contents from the question (C), but was?”

According to Hypotheses 29
Group Dynamics

The effects of Cooperation and Competition

The cooperative subjects in answer to the question (C), "How good were the contributions of others?" rated one another's contributions to be better than did the competitive subjects. This result can also be taken to indicate greater positive cathexis among Indiv coop.

The next question of interest has to do with the extent of the generalization of the friendliness shown during the experimental meetings. The question (D), "How much did the weekly small group meetings stand out for you in contrast with the other classes you attend during the week?" is the only relevant measure. The average responses for the cooperative and the competitive groups were not significantly different. On the average, the subjects rated the weekly meetings as, "Thought about some—more prominent in my thinking than some of my other courses, but not more prominent than most of my other courses." Since the experimental sessions were not especially prominent in the lives of the subjects, there is little reason to expect much generalization of cathexis to other areas.

Various measures were taken to test the extent of generalization: ratings of Fellow members with respect to desirability as a friend, rating of amount of friendly feeling toward others, time taken to learn first and last names, correctness of spelling of last names, amount of time spent together in outside activities and kinds of activities jointly engaged in outside of class. Table 23.11 presents most of the evidence.

Indiv coop learned one another's last names sooner than did Indiv comp (as reported on the final questionnaire). They also spelled one another's names more nearly correctly, but the size of this difference is significant at only the 11% level of confidence. No differences were obtained with regard to learning first names or in the frequency or kinds of outside activities undertaken together. At the end of the experiment, Indiv coop rated themselves as being more friendly towards one another than did Indiv coop. These differences, however, are clearly not statistically significant. The data thus indicate that little generalization of cathexis occurred. The relative lack of generalization was probably due to (a) the relative lack of importance of the goals involved in the experiment and (b) strong restraining forces against any inclinations toward increased sociability which might have resulted from the experimental situation.

Hypothesis 28 states that the group and its products will be evaluated more highly by Indiv coop than by Indiv comp. Table 23.12 presents the relevant data. In answer to the question (C), "Did the group help your thinking?" the ratings revealed significantly more help among the cooperative than among the competitive members. Similar results were obtained from the question (C), "How good do you think the group's product was?"

According to Hypotheses 29 and 30 there should be a greater percentage
of group functions among Indiv coop and a greater percentage of individual functions among Indiv coop. The data in Table 23.12 support these hypotheses with respect to the human relations problems but not the puzzles. The lack of difference for the puzzles suggests that (a) the objectively demonstrable solution of the puzzles makes it more difficult for individuals to produce the rationalizations necessary for "civilized" blocking or aggressive behavior, and (b) a demonstrable solution compels a certain degree of agreement and acceptance, making group functions more likely. Thus, the competitive groups have a significantly greater percentage of group functions in the puzzles than in the human relations problems and a slightly smaller percentage of individual functions in the puzzles. Similar, but less marked, differences are found for the competitive groups on the two kinds of problems.

### TABLE 23.12

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>Problem Type</th>
<th>M Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group help to thinking (C)</td>
<td>H. R.</td>
<td>+1.05</td>
<td>.001</td>
</tr>
<tr>
<td>How good was group product (C)</td>
<td>H. R.</td>
<td>+1.22</td>
<td>.01</td>
</tr>
<tr>
<td>Total group functions (B)</td>
<td>H. R.</td>
<td>+4.64</td>
<td>*</td>
</tr>
<tr>
<td>Total individual functions (B)</td>
<td>P</td>
<td>+.08</td>
<td>not sig.</td>
</tr>
<tr>
<td>Blocker (B)</td>
<td>H. R.</td>
<td>-3.87</td>
<td>.05</td>
</tr>
<tr>
<td>Blocker (B)</td>
<td>H. R.</td>
<td>-2.10</td>
<td>not sig.</td>
</tr>
<tr>
<td>Self-defender (B)</td>
<td>P</td>
<td>-2.5</td>
<td>not sig.</td>
</tr>
<tr>
<td>Self-defender (B)</td>
<td>H. R.</td>
<td>-1.03</td>
<td>.05</td>
</tr>
<tr>
<td>Self-defender (B)</td>
<td>P</td>
<td>-1.10</td>
<td>not sig.</td>
</tr>
</tbody>
</table>

* Differences for four pairs are in the same direction as the total mean difference; these differences have p values of .001, .001, .02, and .01. The other pair, in the opposite direction, has a p value of .05.

Hypothesis 53 states that Indiv coop will perceive themselves as having more favorable effects on fellow members than will Indiv coop. Table 23.13 indicates that the cooperative subjects saw their fellow members as reacting more positively to their ideas, the competitive members perceived that their ideas were being ignored more frequently, and the cooperative members felt that their contributions would be evaluated more highly.

Hypothesis 54 asserts that there will be greater internalization of the attitude of the generalized other by Indiv coop than by Indiv coop. Most of the experimental data already discussed are relevant to this hypothesis, but, in the more restricted sense of identification with the attitudes of others, two complementary measures, the feeling of obligation to others

### The Effects of Cooperate and the desire to win the response

23.13 presents data which indicates a group to participate. The desire to win the respect role in the motivation of Indi

### Differences between Cooperate Effects on Others and in 1

<table>
<thead>
<tr>
<th>VARIABLE</th>
</tr>
</thead>
</table>

How did others react to your idea? How frequently did others react? How will others rate your contribution? Strength of feeling of obligation to others? Strength of feeling of obligation to self? Strength of desire to win respect of others? Strength of desire to win respect of self?

* Four pairs are in the same direction as the total mean difference; these differences have p values of .01, .04, .12, and .36. The other pair is not significant. The other pair has a p value of .01. The other pair has a p value of .02. The other pair has a p value of .33.

### Summa

#### Basic Hypotheses

The evidence for the basic hypothesis that the data collected to test the hypothesis also, in effect, test the basis.

The experimental findings:

1. Indiv coop will perceive that they are dependent and Indiv coop is triply interdependent (Hyp. 5). The evidence is significant in 10 direction also, in effect, test the hypothesis.

2. There will be greater salient among Indiv coop than Indiv coop obtained in connection with the experimental findings.

3. A larger percentage of at least Indiv coop: a larger portion catachetically among Indiv coop.

4. There will be a greater percentage among Indiv coop (Hyp. 4).
The Effects of Cooperation and Competition

and the desire to win the respect of others, are especially pertinent. Table 23.13 presents data which indicate that Indiv coop felt more obligated as members of a group to participate in joint effort than did Indiv comp. The desire to win the respect of the other members also played more of a role in the motivation of Indiv coop than Indiv comp.

### TABLE 23.13

Differences between Cooperative and Competitive Groups in Perception of Effects on Others and in Feeling of Obligation to Other Members

<table>
<thead>
<tr>
<th>Variable</th>
<th>Problem Type</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. R.</td>
<td>+.61</td>
<td>*</td>
</tr>
<tr>
<td>H. R.</td>
<td>+.49</td>
<td>†</td>
</tr>
<tr>
<td>H. R.</td>
<td>+.49</td>
<td>†</td>
</tr>
<tr>
<td>H. R.</td>
<td>+2.80</td>
<td>.01</td>
</tr>
<tr>
<td>P</td>
<td>+1.55</td>
<td>.10</td>
</tr>
<tr>
<td>H. R.</td>
<td>+1.53</td>
<td>.09</td>
</tr>
<tr>
<td>P</td>
<td>+2.38</td>
<td>.001</td>
</tr>
</tbody>
</table>

* Four pairs are in the same direction as the total mean difference; the differences for these pairs have p values of .01, .04, .12, and .38. The other pair has a p value of .72.
† Four pairs are in the same direction as the total mean difference, with p values of .01, .03, .04, and .18. The other pair has a p value of .02.
‡ Four pairs are in the same direction as the total mean difference, with p values of .01, .02, .06, and .28. The other pair has a p value of .33.

Summary and Conclusions

### Basic Hypotheses

The evidence for the basic hypotheses is, for the most part, indirect. Data collected to test the more specific hypotheses about group functioning also, in effect, test the basic hypotheses.

The experimental findings give support to the following hypotheses:

1. **Indiv coop** will perceive themselves to be more promotively interdependent and **Indiv coop** will perceive themselves to be more conformingly interdependent (Hyp. 1).
2. There will be greater substitutability for similarly intended actions among **Indiv coop** than **Indiv coop**. This hypothesis is supported by data obtained in connection with Hypotheses 7 and 9, but the data are ambiguous with respect to Hypotheses 8 and 16.
3. A larger percentage of actions of others will be positively cathectized among **Indiv coop**; a larger percentage of actions of others will be negatively cathectized among **Indiv coop** (Hyp. 3).
4. There will be a greater positive inducibility among **Indiv coop** than among **Indiv coop** (Hyp. 4).
5. *Indiv coop* will exhibit more helpfulness and *Indiv comp* will exhibit more obstructiveness (Hyp. 5).

Thus, all in all, the theory of cooperation and competition has been given considerable backing by the present experimental investigation.

**Group Functioning**

The results, with respect to aspects of group functioning, indicate that *Indiv coop* showed more of the following characteristics than did *Indiv comp*: (a) coordination of efforts; (b) diversity in amount of contributions per member; (c) subdivision of activity; (d) achievement pressure; (e) production of signs in the puzzle problem; (f) attentiveness to fellow members; (g) mutual comprehension of communication; (h) common appraisals of communication; (i) orientation and orderliness; (j) productivity per unit time; (k) quality of product and discussions; (l) friendliness during discussions; (m) favorable evaluation of the group and its products; (n) group functions; (o) perception of favorable effects upon fellow members; and (p) incorporation of the attitude of the generalized other.

*Indiv coop* showed more (a) production of signs in the human relations problem, and (b) individual functions.

No significant differences were found in the (a) amount of interest or involvement, (b) amount of specialization of function, and (c) amount of learning (though the trend is in favor of *Indiv coop*). Nor did the data reveal any striking developmental differences with time.

**Practical Implications**

To the extent that the results have any generality, greater group or organizational productivity may be expected when the members or subunits are cooperative rather than competitive in their interrelationships. The communication of ideas, coordination of efforts, friendliness, and pride in one's group which are basic to group harmony and effectiveness appear to be disrupted when members see themselves to be competing for mutually exclusive goals. Further, there is some indication that competitiveness produces greater personal insecurity through expectations of hostility from others than does cooperation. The implications for committees, conferences, and small groups in general appear fairly obvious.

Also, in light of the results of this study, it seems that educators might well reexamine the assumptions underlying their common usage of a competitive grading system. One may well question whether a competitive grading system produces the kinds of interrelationships among students, the task-directedness, and personal security that are in keeping with sound educational objectives.
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References