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THE DEVELOPMENT OF OUTCOME MEASURES FOR TEACHING PROCEDURES LEADING TO GROUP COHESION

by

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---Study to shew thyself approved unto God, a workman that needeth not to be ashamed, rightly dividing the word of truth

II Timothy 2:15

PREFACE

This study is an attempt to look at classroom process in a new light--that of the effect of the classroom process on the socialization of the individual. Two sharply contrasted classroom procedures, group-centered and teacher-centered, are introduced so that their consequences may be investigated. New measurement techniques are used here to get at the influence of these procedures on the perception and feelings of the student. Finally, the relation of the two procedures, their perceptual and emotional consequences, and group cohesion is explored in terms of the physiology and psychology of the individual. It is hoped that the present experiment may lead the way to others in the penetration of comparatively unknown territory: the consequences of relationship between student and teacher, and between student and student, for personality development. The kind of classroom experience the individual has may be second only in importance to his family experience in determining how he will relate to others--and to himself.

Three persons, more than any others, saw the writer through to the final completion of this study. The patience and understanding of Harold Guetzkow are mixed in this work like steel reinforcement in concrete. The

friendly interest and encouragement of George Satter kept the results flowing smoothly from the huge concrete-mixer of data. The know-how of both these men helped shape an artistic and scientific whole. Both were unsparing in their criticism, when they felt it necessary, and both were unsparing in their help throughout the year and a half of work that this study represents. Finally, a necessary condition for the existence of this paper has been the faith and courage of Shirley Gwen Bovard.

Valuable theoretical contributions have been made by the following: Gerald Gurin, who was the first to point out the significance of the initial standard deviation for estimate of rectangle length, and its relation to freedom from conformity pressure in a cohesive group; Theodore M. Newcomb, whose theory of the relation of social hostility to lack of communication between individuals provided a cornerstone for the theoretical connection between interaction and affect; and Max L. Hutt, whose stress on the role of interaction and cross-identification in group therapy provided insight into the real meaning of group cohesion for the individual. The vital personality of Urie Bronfenbenner lies behind much of this work: his development of group-centered teaching procedures at the University of Michigan will eventually mean as much to education in Western society as it did to the students who flocked to his courses.

The necessary day-to-day technical assistance and moral support for a long-term project such as the present endeavor was forthcoming at all times from the writer's partner in this undertaking, Wilbert J. McKeachie. The design and techniques of this study are in their immediate formulation a joint, and the writer believes, a happy result of this partnership.

Finally, the statistical skill and perseverance of Miss Marian Heilman were instrumental in reducing an unwieldy mass of data in short order to a manageable set of parameters. Without her enthusiasm and devotion to the task, this project could never have been completed on schedule.

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I. INTRODUCTION

If teaching is considered as part of the socialization process for the individual, as many think it should be, then the importance of what happens in the classroom aside from the usual intellectual activity becomes manifest. The classroom procedure may turn out a well-balanced, socialized citizen, and then again it may not. It may help the student relate to others and it may not. What can hardly be denied, however, is that the structure of the classroom process, with the resultant relationships of the individual to the teacher and to other students, probably has a heavy influence on that individual's development, if only from the sheer weight of time that he puts in behind his desk. What kind of influence cannot be shown until we know more about the process itself. Let us examine some previous work in this direction.

The influence of the teacher's role on the personality growth of the individual has been investigated by H. H. Anderson (2). He sees, in general, two types of teacher performance, leading to what he terms integrative (spontaneous, harmonious) and dominative behavior on the part of the student, respectively. The emergence of originals in thinking, and creative activity, he believes to be a function of the kind of teaching behavior in the classroom.

The influence of an adult leader's role in establishing authoritarian, democratic and laissez-faire atmospheres in boys clubs was demonstrated by Lippitt and White in 1939. The relationships of the club members to each other and to the teacher were a function of the kind of atmosphere established in the group (18).

The relationships among students themselves were investigated by Moreno, using what he called sociometrics to obtain the individual's likes and dislikes for others in the group (23).

The relationships in a group situation among boys on the verge of their teens with neurotic tendencies was investigated by Slavson, who used activity group therapy techniques to build cohesive groups among these youngsters (30).

From the work of Slavson, Wender (31) and Redl (25) among others in group therapy particularly following the war, it came to be realized in some quarters that the classroom process might be considered as a group situation, where the teacher's role, group atmosphere established, affective relations among students and between students and teacher, and the amount of cohesion developed, would all have to be taken into account, and no longer treated as if they didn't exist. For behind desks in the classroom human beings experience all the emotions they do outside the classroom. And feelings can be twisted or distorted,

or guided in positive directions, in the classroom as well as anywhere else. They are being so twisted and guided now, but largely only by chance.

We are not aware of what the classroom process is or does, just as we used to be unaware of how emotional attachments in childhood, in the family situation, influenced our later lives. But the attachments were there, whether we recognized them or not.

With some of these considerations in mind, Bronfenbenner developed at the University of Michigan in 1947-1948 what has been termed "group-centered" class procedures. These latter were aimed at giving the student support in a permissive group atmosphere, encouraging interaction and group formation among the students, and reducing teacher-student status distance. Group decisions were specifically encouraged. A modified psychodramatic technique (6) was used. It was felt by Bronfenbenner that such a classroom procedure actively enhanced the socialization of the individual.

In the meantime at the University of Michigan, interest in the elementary psychology course was directed towards measurement of differences in intellectual performances as outcomes of sharply differentiated teaching procedures. McKeachie and Guetzkow designed and executed a large-scale experiment, using three teaching methods: tutorial, where the student worked individually with the instructor in

class; recitation, where the instructor had the initiative; and discussion, where debate was encouraged. The measuring instruments showed some small but significant difference in outcome, with recitation section students liking their class most and scoring highest on the final examination. Bovard then developed a test for scientific thinking, consisting of verbal problems, to measure any increment resulting from a semester of teaching designed to encourage critical thinking through the use of special techniques, such as having the teacher "think out loud" before the class, and encouraging critical reception of material on the part of the students. Again little difference over a semester was found, the difference once more being statistically but hardly educationally significant (4).

In the midst of this intensive experimentation, two opposed classroom process prototypes slowly began to emerge. The first was, in essence, Bronfenbenner's group-centered technique, with its emphasis on student-to-student interaction, group decision, and a generally supportive and permissive emotional atmosphere, leading to group cohesion.

The second prototype was an example of the kind of normal classroom procedure at Michigan and elsewhere, with the teacher asking some students questions and answering the questions of others, taking the initiative in matters pertaining to procedure, and providing in general an

intellectually stimulating atmosphere in the best academic tradition, while at the same time maintaining friendly relations with the students. Interaction here was largely between teacher and individual student.

At the suggestion of Guetzkow, Bovard and McKeachie undertook the design of an experiment to test differences in outcome of these different procedures with reference to perceptual, affective, attitudinal and content measures. McKeachie, who concerned himself with attitudinal changes, reports his results in his own dissertation (20).

The present dissertation is thus a report of the outcome measures for these two prototypes of classroom procedure, with special reference to measurement of affect and percept.

Before closing these introductory remarks, it may be of interest to note that, at the time (Spring semester, 1948) Bovard and McKeachie were executing this experiment, a survey made by Associate Dean Lloyd Woodbourne of the College of Literature, Science and the Arts at the University of Michigan, covering colleges in 40 states showed "no research on classroom process in progress" (13). The first of what may become yearly conferences on classroom process, held April 10, 1948 at the University of Michigan, showed however that a large-scale experiment in this area in the Effective Living course at Michigan State was in progress under the direction of Pepinsky, and that De Long

at Wayne University was interested in development of measures of the student's attitude towards the course and instructor in social science.

Since the time of this conference, the College of Literature, Science and the Arts has adopted a student rating of teachers scale as a means of faculty evaluation, but as Guetzkow suggests in his report of the April, 1948 conference (13) such ratings depend for their validity on correlation with actual behavioral changes other than content outcomes in students arising out of the classroom experience. It is to the end of providing quantitative measures of such behavior that the present work was undertaken.

II. DESIGN

As has already been suggested, the design of the present experiment was to set up prototypes of two contrasting classroom processes, group-centered and teacher-centered. The following specific procedural differences were agreed upon:

1. Interaction. In the group-centered class, interaction between students was to be encouraged by such techniques as referral of teacher-directed questions back to the class where ever possible, encouragement of cross-talk and debate among students, and the use of seating charts by every member of the class.

In the teacher-centered class, interaction between students was to be politely but firmly held at a minimum, with the teacher intervening when any student-to-student exchange sprung up.

2. Group decision. In the group-centered class, the initiative as to much of the class's own daily procedure was left to the class, to be decided on by a vote, or by someone, the teacher or a member of the class, getting the "sense" of the meeting on the question. Such matters decided upon were grading procedures, when to hold examinations, amount of time to be devoted to lectures and to discussion, and so on.

In the teacher-centered class, such initiative was in the hands of the teacher. In general, whenever a purely procedural matter (such as whether to have a psychodrama or not) was decided by the group section of one teacher, then the teacher-centered section of the same teacher was merely told by him to carry out the procedure. Thus course examinations and general procedures were kept the same, and of course the content was the same for both types of sections.

3. Teacher's role. In the case of the group-centered section, this was to be defined by the class; it turned out to be, for the two teachers taking part, primarily member of the group, instigator, and resource person.

In the teacher-centered section, on the other hand, the role of the teacher was defined by him: he was the leader, resource person, and moderator.

In both kinds of groups, maximum friendliness and support of class members was expected from the instructor. An air of permissiveness, insofar as that was consistent with procedural differences in amount of interaction as herein defined, was to be created in both kinds of sections.

The arrangement of the classes as between the two teachers* who took part in the experiment is shown below:

*The results for two sections of a third teacher, C, were not considered in this paper because students in these classes had not been selected by the alternate procedure mentioned on the following page.

Table 1.

Time of meeting and number of students for each of four sections involved in experiment.

Time	G/C:n	Teacher	T/C:n	Time
9 A.M.	27	B	27	8 A.M.
8 A.M.	25	A	25	9 A.M.

The subjects were students in the elementary psychology course at the University of Michigan, Spring semester, 1948, of which these experimental classes were sections. Most of the students were those perennial victims in psychological research, sophomores in the College of Literature, Science and the Arts. Students chose sections largely on the basis of convenience, except that students enrolling for sections at any given hour, of the two available, would be assigned to sections alternately: i.e., the first student registering for an eight o'clock class would be assigned to a group-centered section, the next to a teacher-centered section, and so on. It was hoped by this means to prevent pairs of friends from taking the same class together and thus starting out on a different basis as far as their interpersonal relationship was concerned, than the other class members. As far as is known, few if any pairs of friends were able to get into the same section.

Each pair of sections for the same teacher was roughly matched on score for Otis Self-Administering Test of Mental Ability, higher form A (20-minute test period allowed);

grade point average for previous semester, as reported by each student* (average computed on basis of A is 4, B is 3, C is 2, D is 1 and E is 0); number of veterans, and number of girls in each class. As can be seen below, there is no marked difference among the sections in regard to these variables, except that teacher A's G/C section has a considerably larger number of girls than the same teacher's T/C section.

Table 2.

Means of four sections with respect to (1) Otis Self-Administering Test of Mental Ability, higher form A (20-minute test period) and (2) grade point average for previous semester as reported by student.

	Teacher A		Teacher B	
	G/C	T/C	T/C	T/C
Grade point average	2.37	2.81	2.71	2.48
Otis form A	54.0	55.0	52.5	54.7

Table 3.

Number of veterans and number of girls in each of four sections.

	Teacher A		Teacher B	
	G/C	T/C	G/C	T/C
Veterans	14	11	14	14
Girls	6	2	6	6

With respect to the variables being considered in this experiment, i.e., interaction, perception, affect and group

*A check of grade point averages by students against the actual averages made by these students in the previous semester, made by McKeachie and Guetzkow at the University of Michigan in 1947, showed that the reports can be accepted as fairly reliable indications of the actual average.

cohesion, it is felt that these students were a fairly representative sample of their age group (average age, 22) in the middle and upper middle classes of the American culture.

The students were not informed that they were participating in an experiment until the end of the course. Each section met for one hour three times a week for the 15-week course.

As far as assignment of the two participating teachers to sections went, it should be clear that once one of the four sections was assigned to a teacher, then assignment of the other three had been determined. Teachers A and B therefore flipped a coin to see who should teach one out of the four sections, the result determining the other assignments.

III. GROUP COHESION

Since it was felt that the group-centered process might lead to group cohesion, the instruments of measurement developed were considered as having been developed for the measurement of outcome of the teaching procedures leading to cohesion. It therefore now becomes pertinent to secure a working definition of cohesion.

One hint in this direction was provided by Festinger (9). He suggested that cohesion is the force that keeps the individual in face-to-face contact with the group. Another lead comes from the first Lippitt study (17, p.37). At the end of 12 weeks, the members of both the authoritarian and democratic clubs were asked to vote on the question of whether the meetings should stop or continue for a longer period. All of the authoritarian group voted to stop with that meeting; four out of five of the democratic group voted to continue the meetings. Still further evidence comes from the work of Slavson with his activity therapy groups. His work suggests that a cohesive group has a sort of internal equilibrium, a balance which it strives to maintain against disruptive forces (30).

In sum, then, one group is probably more cohesive than another if it wants to stay together longer as a group, that is, if it wants to maintain itself as a group, and if

it wants to act as a group. In a word, cohesion means that the group has developed an integrity of its own: the cooperative mechanisms have been developed that enable it to maintain itself as a group in a new situation and to go on to act as a group. The behavioral evidences that are believed to indicate cohesion in the four classes involved in this section are listed in anecdotal form in Appendix B, 1 and 2*. It will be noted that the cohesive behavior falls into two general categories: maintenance of the present group situation (as, resistance to breaking up the class, and reforming the chairs in a circle), and the action of the group as a unit in a new project (having a party, eating breakfast at the League). It is felt here that the second kind of behavioral evidence represents a more advanced state of the cohesive process.

At any rate, from available anecdotal evidence, the present two experimenters have concluded that the two group-centered sections did in fact evidence more indications of cohesion than was the case for the teacher-centered sections. In addition, it is argued that teacher A's group-centered section showed a more advanced stage of cohesion than did B's group-centered section. A possible reason for this will be given below (p. 17).

*For further evidence of the contrast in cohesiveness between the group- and teacher-centered sections of teacher A toward the end of the semester, consult the section entitled "Stigmata of Cohesion," beginning on p. 71.

If this conclusion can be accepted, then it becomes pertinent to inquire what procedural variations were concerned in the production of group cohesion.

IV. PROCEDURAL VARIATIONS

The first problem confronted here is the establishment of the fact that procedural variations did actually occur between group- and teacher-centered sections. Observations of three-week samples of all four sections by a total of 42 observers recording (see Appendix C-1) one session each show a substantial difference in the amount of interaction among students as between the two types of class. Observations were made beginning in the 12th week of the semester.

Table 4.

Student-to-student remarks in class sessions of group- and teacher-centered sections.

	G/C		T/C			
Teacher	n	prop.	n	prop.	$SE_{diff.}$	CR (positive)
A	533	.61	93	.10	.019	26.8**
B	266	.34	7	.02	.018	17.8**

An anonymous report secured at the end of the semester from the students of each of the four sections on the number of other students in the class they spoke to when they met them on campus shows that this interaction was carried out beyond the classroom walls.

**Can be accepted as significant statistically at the 1% level of confidence.

Table 5.

Mean number of classmates that students in group- and teacher-centered sections reported speaking to on campus.

Teacher	M G/C	M T/C	$SE_{diff.}$	CR
A	15.74	6.75	1.25	7.1**
B	12.22	8.50	1.68	2.2*

Table 4, it should be noted here before proceeding further, gives too low an idea of interaction in teacher A's G/C section for the reason that members of this class met outside the recitation hour in committees to plan the weekly psychodrama, the class party, and so on. This interaction naturally was not recorded by the observer, but a record of some of the committee meetings is found in teacher A's diary for the two classes, not reproduced in the Appendix because of space considerations.

The amount of interaction among students, as measured by the proportion of student-to-student remarks to total student remarks, provides us with a significant procedural variable. Included in interaction of this kind, however, were a certain number of group decisions in both of the G/C sections. It cannot be determined from the data on hand whether it was the sheer interaction among students, or the practise in making group decisions, or some combi-

*Can be accepted as significant statistically at the 5% level of confidence.

**Can be accepted as significant statistically at the 1% level of confidence.

nation of both, that led to the differences in cohesiveness of the four groups (neglecting the factor of the teacher's role for the moment).

A consideration of the differences in interaction, cohesion, and group decision between the two G/C sections may help to suggest an answer here. It will be remembered that Table 1 shows teacher A's G/C section to have far more interaction than teacher B's section--the difference between proportions for these two sections is .27, with the standard error of the difference being .024 and the CR for the difference 11.29**. It will further be recalled that the anecdotal evidences of cohesion in Appendix B lead to the conclusion that teacher A's section showed more cohesiveness, as it has been defined here, than teacher B's section.

These figures suggest some direct relationship between interaction and cohesiveness. But the records for both sections on number of group decisions made shows that it is the least cohesive of the two sections, teacher B's class, that made appreciably more group decisions during the term (the exact figures are not available). This G/C section was permitted to organize its own course content, determine the approximate length of assignments, decide when tests should be held, and so on, so that it had much more to say about the content organization of the course than

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**Can be accepted as significant statistically at the 1% level of confidence.

did teacher A's. This evidence therefore suggests, but of course by no means conclusively, that it was interaction per se, including interaction that went on during group decisions, and not so much the number of group decisions made, that was an important factor in the production of cohesiveness.

The remaining procedural variable, the role of the teacher, deserves extended and detailed consideration because of the importance it has for both the structure and theory of this experiment. It might first be considered possible that the greater cohesion in the G/C sections was a function of greater liking for the teacher in those sections. The evidence presented below does not permit of such a conclusion.

Table 6.

Mean student ratings assigned to the teacher on affect scale by group- and teacher-centered sections.

Teacher	M G/C	M T/C	$SE_{diff.}$	CR
A	3.87	3.27	.422	1.18
B	3.28	3.00	.439	.633

The ratings were on a scale from minus five, for strong negative feeling, to plus five, for strong positive feeling, and were obtained anonymously during the last week of the semester (see instructions and sample copy of the affect scale, Appendix C-3). It will be noted that accord-

ing to this scale both teachers were liked slightly better in the G/C sections than in the T/C sections. As can be seen, however, neither difference attains a very high level of statistical significance.

Another technique used for getting at the student's relationship to the teacher was the anonymous student evaluation of teacher form, administered towards the end of the course. Students rated the teachers with letter grades from E to A on a number of items, four of which have been selected here because they were found to be most significant in differentiating among teaching performances of 10 teaching fellows, including teachers A and B, then (Spring semester, 1948) instructing in the elementary psychology course. The items chosen were:

1. Clarity and thoroughness of presentation of subject matter.

6. Ability to arouse interest and stimulate thinking.

7. Contribution of this course to your education.

8. Considering everything, rate this teacher's general teaching effectiveness.

The letter ratings on each item were translated numerically: A-4, B-3, to E-0. A copy of the evaluation blank will be found in Appendix C-1. Results follow:

Table 7.

Mean ratings assigned the teacher on four items from an anonymous scale, for student evaluation of teaching.

	Teacher A				Teacher B			
Item	M G/C	M T/C	$SE_{diff.}$	CR	M G/C	M T/C	$SE_{diff.}$	CR
1.	3.18	3.04	.19	.737	2.59	3.00	.181	2.26*
6.	3.55	3.54	.162	.062	2.81	2.95	.220	.636
7.	3.24	3.00	.239	1.00	2.39	2.62	.269	.855
8.	3.50	3.38	.164	.762	3.04	3.42	.188	2.07*

Here again there is little discernible difference between G/C and T/C sections, except for items 1 and 8, where teacher B's performance was evaluated as significantly lower by his G/C students compared to his T/C students. But teacher A, on the contrary, was rated higher on both these items (though not significantly so, statistically speaking) by his G/C section compared to his T/C section. Therefore it would not seem very probable that this difference of performance of teacher B's could be considered as a factor in development of cohesion. Very few significant differences in the role of the teacher as seen by his G/C and T/C students appear also on the anonymous questionnaire administered at the final session of the semester. In the following tabulation, the number who check each item is expressed as a proportion of the total number from that class taking the questionnaire.

*Can be accepted as significant statistically at the 5% level of confidence.

Table 8.

Comparison of group-centered and teacher-centered sections in terms of the proportion of members who check each item in an anonymous questionnaire on teacher's role.

	Teacher A				Teacher B			
Item	p G/C	p T/C	$SE_{diff.}$	CR	p G/C	p T/C	$SE_{diff.}$	CR
a.	.000	.000			.000	.000		
b.	.200	.273	.131	.557	.250	.429	.144	1.24
c.	.000	.000			.000	.000		***
d.	.000	.136		***	.000	.000		***
e.	.150	.136	.108	.129	.333	.095	.115	2.07*
f.	.050	.364	.114	2.75**	.250	.048	.140	1.45
g.	.650	.545	.151	.695	.625	.571	.146	.370
h.	.000	.091		***	.042	.000		***
i.	.000	.000			.042	.000		***
j.	.000	.000			.083	.000		***
k.	.150	.136	.108	.130	.417	.238	.137	1.31
l.	.000	.000			.083	.000		***
m.	.000	.000			.000	.095		***

The questionnaire read: Which of the following describe the leader-group relationship in your lab? Check as many statements as apply.

*Can be accepted as significant statistically at the 5% level of confidence.

**Can be accepted as significant statistically at the 1% level of confidence.

***The formula for the standard error of differences between proportions does not hold for the case where one of the two proportions is zero.

a. The leader often feels antagonism toward the group or its members.
b. The leader is sensitive to the feelings of the individual members.
c. The leader doesn't give members of the class enough emotional support.
d. The leader runs the class too much.
e. The leader expects too much initiative from the class.
f. The leader tends to forget about some people in the class.
g. The group regards the leader as one of its members.
h. The leader plays favorites in the group.
i. The leader is too wishy-washy.
j. The leader is unnecessarily hard on certain members of the class.
k. The leader tends to let discussion wander too often.
l. The leader is too stiff and formal.
m. The leader is too informal.

Only two of these items produce any difference that is statistically significant between G/C and T/C sections, and neither of these differences hold for both teachers. For teacher A, a significantly greater number of members of his T/C class saw him as tending to forget about some people in the class, compared to his G/C class. For teacher B, a significantly greater number of members of his G/C class saw him as expecting too much initiative from the class, compared to the T/C section. A surprising result of this questionnaire was that, although the role of both teachers was structured as leader in the T/C sections, and member of the group in G/C sections, the role was seen as member of the group by a majority of those answering the questionnaire in all sections, with no significant differences in proportion as between the two types of sections. Despite their having to break up student-to-student conver-

sations in the T/C sections, the two teachers were apparently successful in creating there, as well as in the G/C sections, a somewhat permissive and friendly atmosphere insofar as student-teacher relations were concerned.

In summary it appears safe to assume that role differences, except as they were concerned with differences in interaction, were not a major factor in the production of group cohesion in the present experiment.

This leaves interaction as the procedural variation most clearly and directly concerned with the development of group cohesion in the four sections.

The way is now open to move on to the main problem of this inquiry, the development of simple but effective instruments of measurement for the teaching procedures that produce group cohesion.

V. GREEN RECTANGLE

Many theories of personality have found it convenient to introduce perception as the sensitive point of contact between the inner and outer environment of the organism. For example in the system of Lewin and his followers (10), wherein behavior is thought of as the resultant of inner tensions and a powerfield induced by the presence of others, we find this formulation:

> The person is conceived of as a region structured into inner-personal regions corresponding to tension systems, and a surrounding motor-perceptual region, through which the inner-personal region can communicate with the environment. (10, p.580)

Of the inner personal regions, some are deemed more central and some more peripheral, in regard to the fact that the latter are more readily influenced by environment events.

Lecky conceptualizes personality as an organization around the percept of the self, which he believes to be largely parentally-derived (16). Lecky's theory of self-consistency postulates that when the individual's self-percept differs from the percept of himself reflected in the behavior of others, too radically, then maladjustment ensues. In the genetic theory of personality development of Sherif (28), perception again is the agent that relates

the core of personality to the social reality without.

It might be added that Slavson views the process of activity group therapy at least in part as a method of changing the child's self-percept. A new social definition of the self provided by a permissive group may overcome an anxiety-producing definition of the self reflected by the parents in the original family situation. The rejected child who has come to perceive himself as an unwanted object gradually perceives himself as unconditionally accepted, and therefore a more valuable self, in the permissive group atmosphere (30).

In the above formulations, the motor-perceptual mechanism is the bridge between the inner and outer worlds of experience. The self is perceived just like any other object except that it must be perceived more indirectly, through the definition of self reflected in the reactions of other individuals to the self.

With the above theoretical background in mind, it becomes easier to accept and understand recent experimental evidence on the relation of internal (need) and external (social) factors on perception.

To dispose of internal autistic factors first, a study by Bruner and Goodman (7) on estimation of size of coins showed that a group of poor children consistently overestimated coin size in contrast to a group of rich children, whose judgments were closer to the actual size of the coins.

The assumption was that the poor children had greater need of the coins. The experiment has been criticized because of the failure to control some variables believed to be relevant. Using a more exact procedure, Brown (5) repeated the experiment recently at the University of Michigan and obtained results which substantiated Bruner and Goodman in their contention that internal need factors influence perception. Brown had subjects estimate size of aluminum disks of no apparent value. He then told the subjects these disks would be good for a free movie show, let them attend the show, and had them again estimate the size. The disks were now judged to be larger than before. They were potentially capable of satisfying needs.

More pertinent to the present study is the establishment of the effect of social factors on perception. The crucial experiment in this field was performed by Sherif (29) in 1936 at Columbia University. In quantitative terms, he demonstrated the marked shift of an individual's judgments of an ambiguous stimuli caused by inclusion of the individual in a group judging the same stimulus.

The shift was consistently in the direction of the group standard. To eliminate the factors of past experience and familiarity, Sherif chose as his stimulus a tiny point of light in a dark, soundproof laboratory. In such circumstances, the subjects will see the light move, although

it remains fixed, and this illusion will sometimes persist even when the subject knows the light doesn't move. The situation thus presented to the naive subject is unstable and lacking in perceptual structure. Sherif found that individuals, first confronted with this unstable field when alone, set up their own frame of reference for judgment. That is, their estimates of how far the light moved clustered around an individual norm. Then in the following group situations the judgments of the subjects converged on the common norm. This convergence was more pronounced when the subject was immediately introduced into the group and was not allowed an opportunity to set up his own anchorage point. The crux of the experiment came in the subsequent alone situation. There, 24 hours after the group test, judgments of the subjects still clustered around the previously established social norm. The group was gone, but its norms lived on. Then Bovard (3) found in a follow-up experiment to Sherif's work that a social norm for the perception of this stimulus can last as much as 28 days, although some individuals are more resistant than others to social norms and tend to revert to their own norm in this period. To get back to Sherif, that experimenter in order to determine whether or not convergence found was a true resultant of the group situation, put some subjects through four individual trials on four consecutive days and found no convergence whatever.

He was thus able to show the dominant influence of social factors in perception of ambiguous stimuli. The very ambiguity of the situation, however, arbitrarily limited the applicability of his findings. What would be the influence of social framework in modifying perception of highly objective and structured situations such as those encountered in everyday life?

Schonbar (27) tackled the problem by asking pairs of subjects to estimate the discriminably different extents of movement of a point of light in an objective situation. Her results confirmed the work of Sherif in every respect. Even in judging this completely unambiguous stimulus, the subject typically set up his own standard in the first alone test, then shifted this norm toward a common standard in the group situation with another subject. Then, the group standard of judgment was transferred over to the second alone situation.

It is here contended, therefore, that precisely because perception is the sensitive point of contact between the inner zone of personality and the outer social reality, that it can probably be used in the measurement of the classroom procedures that lead to group cohesion. That is, the group exists to some extent insofar as it impinges on the individual, and the extent to which the perception of a stimulus by individuals in a group is influenced by the group norm, might be considered as an index of the

potential cohesion in the group. One measure of the procedures leading to group cohesion may therefore be, other things being equal (such as internal need factors and familiarity with the object) the extent to which individuals in the group accept, or are influenced by, the group standard for the perception of an objective stimulus.

The hypothesis to be tested was that at the end of one term of college instruction, students in group-centered classes where a determined effort had been made to encourage interaction would evidence a greater change towards the group norm for visual perception of length of a rectangle after being informed of that norm, than would students in teacher-centered classes, it being assumed that both kinds of classes were random samples from the same general population.

The assumption was that errors in measurement caused by differences in suggestibility, or internal need factors among the students, would be randomly distributed among group-centered and teacher-centered classes. This assumption was tested by comparing performances of both types of class at the beginning of another semester, when theoretically there should be no significant difference in convergence.

The subjects in this first experiment in January, 1948 with the green rectangle were 248 elementary psychology

(Psych. 31) and 256 psychology of inter-personal relationships (Psych. 41) students in 21 sections at the University of Michigan. The main differences in classroom procedure between these courses were the differences that obtained between the group-centered and teacher-centered sections taught by teachers A and B in the Spring of 1948. As has been explained, the group-centered class was the prototype of the kind of class developed in Psych. 41 by Bronfenbenner, and as has been suggested, the teacher-centered class was developed as the prototype of the best kind of the Psych. 31 teacher-centered sections. On the average, then, the Psych. 41 sections sampled in this experiment represented the classroom procedures of encouragement of interaction, use of group decision, and permissiveness and reduction of status of instructor that were later formalized for their experiment by Bovard and McKeachie. On the whole, also, the Psych. 31 sections represented a more traditional teaching pattern, with the main source of interaction between student and teacher, and the latter more in the role of a leader than of a member of the group, as he was in most Psych. 41 sections. If one major and very real source of difference in procedure had to be named, it would have to be amount of interaction among students. For generally in Psych. 41 interaction was fostered and encouraged; as has been said, in Psych. 31, the interaction was largely between teacher and student.

The apparatus used in this experiment was a green rectangle of paper pasted on a larger rectangle of cardboard. The procedure was to ask the class members to estimate anonymously the length of the green rectangle. They were told that they would have to estimate it again in four minutes to determine what effect the passage of time would have on the accuracy of their perception. The slips of paper containing the first estimates were collected and read aloud to the experimenter, who calculated the mean and announced it casually to the class. A second estimate of the rectangle length was then required. The rectangle was shown for 30 seconds on each occasion in exactly the same place (please refer to Appendix C-2 for exact procedure). The difference in standard deviations between the two sets of judgments was then obtained, providing a measure of how much announcement of the norm had caused the standard deviation to shrink around the average. The hypothesis was that in the group-centered sections, much greater convergence around the mean would be found in the second judgment than in the teacher-centered sections.

The initial assumption that the uncontrolled variables of differences in suggestibility, and internal need factors among the students, would not produce differences with respect to the green rectangle between group-centered and teacher-centered classes was put to the test by testing 129 Psych. 31 and 137 Psych. 41 students with the rectangle at

the beginning of the Spring semester, 1948. If the assumption was correct, then there would be no difference in convergence on the group norm for perception of the rectangle between group-centered and teacher-centered classes at the beginning of their respective courses.

Examination of results in the table below suggests that, if it can be further assumed that there was no marked difference between the population of Psych. 31 and 41 students as a whole in the 1947-1948 Winter semester, and the 31-41 population in the Spring semester, then it can be determined that the initial assumption referred to above was justified. Here are the results when samples of the two courses were tested at the beginning of the Spring 1948 semester:

Table 9.

The standard deviation of estimates of length of the green rectangle in an ordinary classroom situation before and after the class is informed of the group average.

Type course	n	SD (1)	SD (2)	$SE_{diff.}$	CR
T/C (Psych. 31)	129	1.41	1.02	.107	3.64**
G/C (Psych. 41)	137	1.18	.887	.089	3.25**

The convergence of the members of both types of course towards the norm is therefore highly significant statistically. What we wish to know, however, is there any difference in <u>amount</u> of convergence between the two courses that could not plausibly be accounted for by chance? Inspection of the

**Can be accepted as significant statistically at the 1% level of confidence.

table reveals that the standard deviation of the T/C sections diminished by .39 when the class average was announced, whereas the SD of the G/C sections shrunk by .29 units (inches in the present case). Is the difference in amount of convergence, .10 inches, significant? McNemar (21) has developed a formula for the standard error of the difference between sigma differences, similar in form to the formula for the standard error of the difference between standard deviations. The formula is,

$$\sigma\,(\sigma_1-\sigma_2) - (\sigma_3-\sigma_4) = \sqrt{\sigma^2\sigma_1-\sigma_2 + \sigma^2\sigma_3-\sigma_4}$$

But we have from Table 9 that

$$\sigma_{D_{tc}} = .107$$

and

$$\sigma_{D_{gc}} = .089$$

and substituting these values in the above formula, we have

$$\sigma_{D_{tc-gc}} = .14$$

but

$$D_{tc}\,(\sigma_1-\sigma_2) - D_{gc}\,(\sigma_3-\sigma_4) = .10$$

Therefore CR = $\frac{.10}{.14}$ or .71.

Our conclusion is, therefore, that there is no significant difference in amount of convergence on the group norm for rectangle length for G/C and T/C section samples at the beginning of a semester.

The results at the end of a semester tell a different story, however. Here is data obtained from T/C (Psych. 31) and G/C (Psych. 41) sections at the end of the Winter 1947-1948 term.

Table 10.

The standard deviation of estimates of the length of a green rectangle in an ordinary classroom situation obtained before and after the class is informed of the group average. Data for group- and teacher-centered sections at end of Winter semester, 1947-1948.

Type course	n	SD (1)	SD (2)	SD(1)-SD(2)	$SE_{diff.}$	CR
T/C (Psych. 31)	119	1.07	.882	.19	.09	2.1*
G/C (Psych. 41)	119	1.58	.943	.637	.118	5.39**

then we have

$$D_{gc}\ (\sigma_1-\sigma_2) - D_{tc}\ (\sigma_3-\sigma_4) = .449$$

$$\sigma_{D_{gc-tc}} = .148$$

$$CR = \frac{.449}{.148} = 3.03^{**}$$

The hypothesis that students in group-centered classes would show a greater change towards the group norm in their estimates of length of the green rectangle after being informed of that norm, than would students in teacher-centered classes, at the end of one semester in the respective types of class, has therefore been demonstrated to be tenable.

*Can be accepted as significant statistically at the 5% level of confidence.

**Can be accepted as significant statistically at the 1% level of confidence.

The green rectangle may thus be considered a rough index of the "group-centeredness," or potential cohesion, of a classroom group. The rectangle does not of course give us a direct measure of cohesion. It does give us a measure of the teaching procedures, the most important of which is believed to be interaction among students, that appear from the experiment with the four sections of teachers A and B to lead to cohesion.

The apparent effect of teacher-centered procedures in Psych. 31 classes is to reduce the amount of convergence on the group norm over the semester, while the group-centered procedure with Psych. 41 students has precisely the opposite effect, as can be seen from the table below. It will be remembered that, as Table 6 shows, the amount of convergence at the <u>beginning</u> of the semester for sample sections from the two types of course was approximately the same.

Table 11.

Differences in amount of change in standard deviation of estimates of the length of a green rectangle obtained when class is informed of the group average, as between samples of the same course at the beginning of the Spring, 1948 semester and at the end of the Winter 1947-1948 semester.

Course	SD(1)-SD(2) beg. Spring	SD(1)-SD(2) end Winter	D	$SE_{diff.}$	CR
T/C(31)	.39	.19	.20	.139	1.44
G/C(41)	.29	.637	.347	.147	2.36*

*Can be accepted as significant statistically at the 5% level of confidence.

An unexpected finding in this initial experiment with the green rectangle was that the estimates of length of the rectangle made in group-centered sections before the class average became known were more widely distributed than the same estimates for teacher-centered sections.

Table 12.

Comparison of size of initial standard deviations of estimates of length of a green rectangle in an ordinary classroom situation as between group-centered (Psych. 41) and teacher-centered (Psych. 31) sections.

Time	SD(1)-T/C	SD(1)-G/C	Dgc-tc	$SE_{diff.}$	CR
Beg. Spring 1948	1.41	1.18	.23	.112	2.05*
End Winter 1947-48	1.07	1.58	.51	.123	4.2**

In starting out their course, then, students in the teacher-centered Psych. 31 sections showed a greater initial spread in estimates of rectangle length than did students in the group-centered Psych. 41 sections at the beginning of their course. One possible explanation might be that since Psych. 41 is a more advanced course than Psych. 31, students at that level have had at least six more months of teacher-centered classes of all kinds (including Psych. 31) than have the Psych. 31 students, and that therefore at the outset the Psych. 41 students are potentially less cohesive, because a lot of the cohesiveness has been taken out of them, if we may put it that way.

*Can be accepted as significant statistically at the 5% level of confidence.

**Can be accepted as significant statistically at the 1% level of confidence.

The results at the end of the semester in both courses show a startling reversal of this trend. Now the positions have been almost exactly reversed, with the Psych. 41 group-centered sections showing a significantly larger initial spread in their estimates of rectangle length compared to the Psych. 31 teacher-centered sections. An interesting check is that the initial spread for the Psych. 31 students at the end of the semester is almost exactly the same as the initial spread for the Psych. 41 students at the beginning of their semester.

These findings are in apparent conflict with the results of F. H. Allport's early studies on the effect of social stimulation on judgments of odors and weights (1). It will be recalled that Allport found in general that the presence of the group tended to decrease the number of extreme judgments, compared to those made by the individual alone. The present results show that judgments made in a potentially cohesive, or group-centered group tend to be more extreme than those made in a potentially less cohesive group. As Table 12 indicates, at the end of the semester the estimates in group-centered sections are more extreme than they were at the beginning of the semester. The effect of this kind of teaching then is to increase the spread of initial estimates.

How are these results to be brought into harmony with those of Allport? One possible explanation lies in the

nature of the groups that Allport used. These were small groups of about five graduate students, where the social type of interaction encouraged in the present group sections was, if not specifically banned, at least severely limited by the nature of the experimental design. It is doubtful from a reading of Allport's findings whether the group members met together long enough to get to know each other very well. Allport's groups were then in a sense collections of strangers who never had an opportunity for interaction. Extreme judgments were avoided, Allport says, because of "an attitude of submission which we assume, often unconsciously, in the presence of a group." (1, p.277) This can be termed the pressure for social conformity. This pressure would, then, dampen the extreme estimates of rectangle length made by the group-centered students at the beginning of the semester, before any interaction had a chance to occur, and when their sections were like Allport's groups "collections of strangers."

What the present results indicate then is that group-centered teaching, with its development of potential cohesiveness, tends to <u>reduce</u> the social pressure for conformity on the individual insofar as that operates to dampen his extreme estimates on first viewing the green rectangle. To put it another way, the potentially cohesive group probably gives the individual much of the same freedom to make extreme estimates that he would have if he were alone;

the potentially less cohesive group dampens the extremes of judgments through the pressure of social conformity. A test of this hypothesis would be the comparison of the initial standard deviation for estimates of rectangle length in a potentially cohesive group with the initial spread of estimates for a comparable number of individuals viewing the rectangle alone, one at a time. Each individual who made the judgment alone would have to be matched with an individual in the group for the spot from which he viewed the rectangle and for the vertical and horizontal angles of vision, so that these factors would not becloud the results. These initial standard deviations should be highly similar, with the individual comparatively free to resort to extremes in both cases. A third group of individuals who had not met before, comparable to the other two experimental groups, would then view the rectangle together. If the hypothesis is correct, then the potentially cohesive group and the individuals viewing the rectangle alone should show similarly wide distributions in estimating the length of the rectangle, while the estimates of the "collection of strangers" would be over a considerably narrower range.

Both the size of the original standard deviation of estimates of rectangle length, and the amount of change in standard deviation when the class is informed of the group average, seem then to be rough indices of the "group-centeredness" of a particular class, or its potential cohe-

siveness. The rank order correlation between these two indices over all 21 sections used in this initial experiment with the green rectangle is .70.

What this means, then, is apparently that before the group average is known, individuals in group-centered sections feel freer to make extreme estimates of rectangle length than do individuals in teacher-centered sections. Once the group average becomes known, however, then individuals in group-centered sections will make a greater change in their original estimates in the direction of the group norm than will individuals in teacher-centered sections. This could of course be interpreted as showing that greater pressure for social conformity exists in group-centered sections compared to teacher-centered sections after the norm is announced, even though the position is just the reverse before the norm is announced. It is hard however to imagine that social conformity pressures could vary so instantaneously. It would seem possible that the way "group-centeredness" works to produce changes in estimates of rectangle length toward the group norm is partially through the greater affective ties the group-centered section has as a perceptual object for the individual (see below, footnote, p.58). This emotional bond, it is suggested, may work to directly change the individual's perception of the object without his being conscious of the process at all. That is, the individual actually sees the

rectangle as smaller or larger in the direction of the group norm the second time.

Let us examine in this connection some of the reasons reported for changing their estimate of the rectangle length given in anonymous reports by members of teacher B's G/C section in the second experiment with the green rectangle. As can be seen from Table 14, this section evidenced a pronounced narrowing of standard deviation for estimates after presentation of the group norm.

Some of these reports are, "It looked larger," "It appeared smaller," "It appeared larger the second time," "It was held slightly closer to me," (probably not physically true since every effort was made to present it in the same place for the two 30-second showings), and so on.

Another and possibly more fruitful explanation for the difficulty of trying to account for conformity before the norm is announced by one mechanism, and conformity after the norm is announced by another, is that once the norm is announced, an element of social reality has entered the perceptual estimate. There is, in short, a change to the group norm because it is probably more accurate than the individual norm. It will be noted from Table 7 that both T/C and G/C sections, after the norm is announced, end up at approximately the same scatter for their estimates:

T/C (31)-SD(2)	G/C (41)-SD(2)	$SE_{diff.}$	CR
.882	.943	.0837	.728

Once the norm has been announced, both types of sections arrive at almost the same degree of scatter around it. The amount that they shifted towards the norm, then, seems to be a function of the initial scatter of judgments. As we see from Table 12, the initial scatter was much greater in the G/C section because of what we have here suggested is greater freedom from social conformity pressure in that type of section. The reason, then, that G/C sections shift more towards their own norm is possibly not that there is greater social conformity pressure in them, than in T/C sections, once the norm has been announced, but rather that the G/C sections have a greater distance, a more extreme scatter, to shift and converge from, under the pressure of the social reality of the situation.

This line of reasoning would lead to the conclusion that, if a simple and convenient index of "group-centeredness" or potential cohesiveness of a section is desired, the initial scatter of anonymous estimates of length for the green rectangle may serve the purpose. For, it can be suggested, this initial scatter of judgments may give us a rough index of the extent to which the group-centeredness of the class has freed the individual from social conformity pressures and thus enabled him to make estimates as freely as if he were alone.

Whether or not individuals in a group-centered class tend to make the same kind of extreme estimates they would

if alone must, however, be subjected to the kind of experimental verification suggested above, p. 39.

The green rectangle technique for detecting "group-centeredness" in college classes was put to the test again in the Spring of 1948, when it was given to the four sections taught by teachers A and B, in the 14th week of the term.

Teacher A taught, before the experiment, in both his G/C and T/C sections, the basic principles of the green rectangle technique. The results are shown below:

Table 13.

The standard deviations of estimates of length of a green rectangle in an ordinary classroom situation before and after the class is informed of the group average. Obtained in two comparable group- and teacher-centered sections, where the principles of the experiment had been taught.

Type	n	SD (1)	SD (2)	Diff.	$SE_{diff.}$	CR
G/C	22	.92	.67	.25	.172	1.45
T/C	20	.942	.710	.232	.186	1.25

then we have,

$$D_{gc}\,(\sigma_1-\sigma_2) - D_{tc}\,(\sigma_3-\sigma_4) = .018$$

$$\sigma_{D_{gc-tc}} = .253$$

$$CR = \frac{.018}{.253} = .0711$$

The conclusion is apparently that the green rectangle technique will not detect group-centered teaching procedures if its basic principles are known.

Teacher B did not teach the basic principles of the green rectangle experiment in his two classes. Evidence for this, beside the word of the teachers concerned, is the response on an anonymous questionnaire given to the two sections of teacher A and the two sections of teacher B, to determine what proportion of students in each section were able following the green rectangle experiment to report the correct explanation. The proportion of right guesses among students taking the questionnaire for the two sections of each teacher are:

teacher A	teacher B	$SE_{diff.}$	CR
.68	.38	.107	2.80**

The results of the green rectangle test for teacher B's two sections:

Table 14.

Amount of change in the standard deviation for estimates of length of green rectangle in an ordinary classroom situation when class is informed of group average as between two group- and teacher-centered sections naive as to the principles of the green rectangle technique.

Type	n	SD (1)	SD (2)	Diff.	$SE_{diff.}$	CR
G/C	23	2.03	1.02	1.01	.389	2.60**
T/C	17	.83	.72	.11	.162	.679

**Can be accepted as significant statistically at the 1% level of confidence.

then we have,

$$D_{gc}\ (\sigma_1-\sigma_2) - D_{tc}\ (\sigma_3-\sigma_4) = .90$$

$$\sigma_{D_{gc-tc}} = .421$$

$$CR = \frac{.90}{.421} = 2.14^{*}$$

It is interesting to note in line with the results from Table 12 that a comparison of the initial standard deviations for the G/C and T/C sections of teacher B, shows the former to be significantly higher, with the critical ratio of the difference at 3.26**.

Thus where the subjects are comparatively unfamiliar with the basic principles underlying the green rectangle technique, the latter will serve to discriminate between otherwise comparable group-centered and teacher-centered sections.

**Can be accepted as significant statistically at the 1% level of confidence.

*Can be accepted as significant statistically at the 5% level of confidence.

VI. AFFECT SCALE

Much of the psychology of personality has come from observation of or experience with deviant individuals who exhibited in extreme forms behavioral mechanisms that most of the population exhibits only momentarily. The psychology of group cohesion, in similar fashion, is greatly indebted to the pioneer work of the group therapists who, particularly in the recent war, discovered the effects of group interaction in therapeutic sessions for emotionally disturbed individuals. It seemed very likely that some of the emotional effects of group interaction and group formation obtained in therapeutic sessions might also obtain for group interaction of normals.

Slavson finds his patients can give vent to hostility and aggression that had been bottled up before, in therapeutic sessions in a group situation (30). Accepted by the group, the individual apparently soon loses self-consciousness and is able to regress to a more infantile level where he can get rid of fears and impulses, to some extent, without the necessity of having to feel guilty. The patient, perhaps a shy individual for years, gradually gains self-confidence in the permissive group atmosphere and gets a new percept of himself and his untested powers, as he finds

that no one minds if he is shy and no one makes fun of him if he talks.

It is therefore proposed in regard to the present study that teaching procedures leading to group cohesion will have two concomitant results in regard to the affective relationships of individuals. The first contention is that there will be a higher average level of affect in the group-centered section than in the teacher-centered section: everyone will simply like everyone else better there. In the second place, it is suggested that there will be more emotional expression of all kinds, likes and dislikes, in the group-centered section, since the barriers will be down. That is to say, there will be a greater range or scatter of affective relationships in the group-centered section compared to the teacher-centered section, all other things being equal.

In order to measure the amount of affect within a group, a rating scale was devised which permitted every individual within the group to express anonymously his feelings for every other member of the group on an eleven-point scale, ranging from minus 5 for strong dislike through 0 for no particular feeling one way or the other to plus 5, for strong liking (see instructions and sample scale, Appendix C-3). With such a scale completed by each individual, then, material was at hand for obtaining the general level of affect within the group, the standard deviation of the

affective ratings, the affect of individuals for the group as a whole, the affective level at which each individual was rated by the rest, and the average affect level each individual maintained towards all the other individuals.

The individual rated himself as he wanted the group to rate him. Although the scale was used anonymously, the individual who used it was identified by a code number known solely to him. Through the cooperation of the four sections the code numbers were identified at the end of the semester and thus the individual's rating of where he wanted to be could be separated out from his ratings of the others.

This instrument has the properties of an ordinal scale, since the operations of "equal to" and "less or greater than" can be defined on it (26). That is, if individual X rates individual Y at the point of plus 3, and individual Z at the point of plus 4, we can be fairly certain he likes Z better than Y. If he rates Y and Z both at plus four, then we can be fairly certain he feels about the same amount of positive affect for them both. Like all ordinal scales, however, this one does not have equal units nor an absolute zero. That is to say, if John rates Mary plus 4 and Sue plus 2, we have no right to say he likes Mary twice as much as Sue. The value of this scale is that it can give us a rank order of affect among individuals, or of affect level between groups; but it can never answer the question, how much better does John like Mary than Sue.

This question can only be answered in fundamental measurement where equal units obtain and the operations for addition are specified, so that one can say, Mary is two inches taller than Sue, not only that Mary is taller than Sue.

It should be noted here that most psychological instruments of measurement are at best only ordinal scales (the IQ scale, for example), and that many of them are not even ordinal scales (19).

The present affect scale, then, is an ordinal scale suitable for obtaining rank order of affect either among individuals or among groups.

To obtain the test re-test reliability coefficient of the judgments made this scale was administered to a G/C section in elementary psychology taught by teacher A in the Fall of 1948 at the fourteenth meeting of the class and then again at the fifteenth weekly meeting, one week separating the administrations. The n was 21. The reliability coefficient obtained was .83. The measures correlated were the average affect ratings assigned to each of the 21 individuals. It is felt that memory had a minimal effect, even though the test period was only one week, for the reason that each individual was required to rate 34 others in the class. A class party intervened in the test re-test period, which, as will be noted below, appeared to have the effect of raising the average affect level of 14 of the 19 who attended the party, and lowering the affect level of

the other five, using in this case the ratings of the 19 who attended the party of each other as the basis for tabulation.

A split-half correlation coefficient for this scale was calculated for the same section by correlating the average rating of each class member by one half of the class with the average rating of each class member by the other half of the class. The coefficient obtained was .62 for an n of 22, but since this was the reliability based on half the class, the reliability based on the whole class is given by the Spearman-Brown prophecy formula as .77.

The validity of the scale had to be measured more or less indirectly. For example, one of the first questions that arose here was whether the students were actually registering their own likes and dislikes on the scale, or whether particularly in the G/C sections they were not being influenced by what they thought teachers A and B wanted them to do. Findings from an anonymous questionnaire suggest that a few in each section were so influenced, but that there was no significant difference between G/C and T/C sections in this regard.

Table 15.

Means of anonymous responses in group- and teacher-centered sections to request by teacher, "Please rate now how much what you thought I would like you to do on the test (i.e., affect scale) influenced your ratings at the time--from zero, for not at all, to five, for very much. That is, when you rated a person plus or minus, how much did your idea of my feelings toward that person influence your mark." Request made at final class session.

Teacher	M G/C	M T/C	$SE_{diff.}$	CR
A	.304	.238	.176	.375
B	.200	.143	.140	.407

Another source of evidence as to the validity of the judgments made on the affect scale comes from the observations of the teachers in the respective sections, particularly as recorded in the class diary kept by teacher A for his G/C and T/C sections. A general feeling as to the level of affect in the two different sections can be obtained from a reading of the extracts in Appendix B, 1. Certainly, the feeling one gets is that the G/C section is lively, more spontaneous, and operating at a high level of good nature, while the T/C section of this teacher seems to be just a bit apathetic and operating on more of an intellectual than emotional level.

More precise confirmation of the results of the affect scale for particular individuals can be obtained by a reference to the diary extracts, Appendix B, 1, and the summary data sheet for the affect scale for teacher A's G/C and T/C sections (Appendix C-3).

For example, a reading of these extracts gives the impression that individual 32 was a spontaneous and natural leader of the class. An examination of the affect summary shows that the class gave him an average rating of plus 3.36, the highest in the class. At the class party, individual 29 led the class in the Hoki Poki dance and enacted the role of the teacher in a psychodrama: is he one of the better liked individuals? One would be inclined to assume so. The affect scale puts him fifth in the class in popularity, with a rating of plus 2.86. Although teacher A appointed individual 35 as chairman of the party committee, it will be noted that he was subjected to some aggression at one of the breakfast sessions in the League (see April 30 extract, in 1, Appendix B). In private interviews with teacher A, one of the students, individual 23, who had shot a water pistol at 35, expressed her feelings of dislike for this person. Rating him on the affect scale, she gave him a minus 5 rating on a scale where few minus ratings are ever given. At the party (see Appendix B, 1), 35 was "worried about attendance" but finally broke through his shell to do a vocal solo. How high does this individual come out on the affect scale? As might be suspected by this time, his rank order in the class in popularity is 17th with a scale rating of plus 1.84. Consider individual 33, who in the May 28 entry (Appendix B, 1) is insistent on having another party, although she didn't attend the first one, in

what appears to be appeasement of the instructor. In private interviews she consistently expressed to teacher A her dislike of the class. Her affect rating by the class of plus .52 comes as no surprise.

In the T/C section of teacher A, there is not so much evidence available, simply because the section members did not interact as much or in as many different situations. None of them ever discussed their feelings toward any other member of the class in an interview with teacher A, as happened in one or two cases in his G/C section. We do have, however, some confirmatory evidence as to the validity of the affect scale from this section. In the discussion on the film, "Feeling of Rejection," as is noted by the two expert clinicians who evaluated this discussion (Appendix C-4), individual 64 takes over the role of leader in the class and interviews other class members. It might be assumed that this spontaneous leadership would not have arisen had not the person involved had at least some affective support from the group. His affect score shows him to be third in the class in popularity with a mean rating of 2.19. He thus was accepted as a leader, and the T/C class did not share the feelings of antipathy he aroused, probably because of his dominative behavior, in the clinicians who evaluated the discussion transcripts (Appendix C-4).

Indirect evidence on the level of affect within the G/C and T/C sections of teacher A comes from Table 19.

It would seem a plausible hypothesis that, if as is shown by these results, members of a group-centered section are apt to discuss the problem of the girl "heroine" of "Feeling of Rejection" in more emotional terms among themselves than are the members of a teacher-centered class, then this is probably to some extent a reflection of the kind of relationship they have with each other. As Dr. Max Hutt reports in his analysis of teacher A's G/C section discussion, this group is "sensitive to the expression of feelings" (Appendix C-4).

If the affect scale can now be accepted from this evidence as a rough index of the individual's feelings towards other individuals in the group, then it is possible to turn to the findings derived from application of the scale to the four sections of teachers A and B.

The scale indicates rather unequivocally that individuals in group-centered classes rate each other higher than individuals in teacher-centered sections.

Table 16.

Mean ratings assigned other students in group-centered and teacher-centered sections on affect scale. Ratings are positive.

Teacher	M G/C	n	M T/C	n	$SE_{diff.}$	CR
A	2.08	522	1.35	501	.123	5.94**
B	1.50	449	.982	400	.110	4.68**

**Can be accepted as significant statistically at the 1% level of confidence.

The difference in levels of affect between G/C and T/C sections is statistically significant at better than the 1% level of confidence. Subjectively, the difference between teacher A's G/C and T/C sections felt to teacher A, he reported, like the difference between immersing oneself in a tub of warm water and immersing oneself in a tub of lukewarm, partly chilly water.

Since the main procedural variation between G/C and T/C sections in this experiment has been shown to be interaction, it is probable that the difference in interaction was a major causal factor in the difference in affect level. To test this assumption in part, let us compare the rank order for interaction and the rank order for level of affect among the four sections involved in this experiment.

Teacher	Section	Interaction	Rank	Affect	Rank
A	G/C	.61	1	2.08	1
B	G/C	.34	2	1.50	2
A	T/C	.10	3	1.35	3
B	T/C	.02	4	.982	4

This evidence implies, but does not of course prove, that a causal relationship exists between interaction and affect level within sections. Further evidence is available, however, that likewise points to interaction as a cause of affect.

The very process in action is illuminated by an experiment performed with a G/C section in elementary psychology taught by teacher A in the Fall of 1948. An affect scale was to be administered to the 19 persons from this class who attended a class party, during the 14th week of the semester, just before the party and again one week later at the next class session to follow the party. These 19 persons rated each other at a mean affective level of plus 1.38 just before the party, and at a level of plus 1.71 just after the party. Here is the data summary:

M_1	n	M_2	n	Diff.	$SE_{diff.}$	CR
1.38	311	1.71	348	.33	.127	2.60**

Of the 19 attending, 14 were liked better afterwards and only 5 lost ground in affect, the scale indicated.

It was suggested earlier in this section that not only would members of a group-centered class like each other better than would members of a teacher-centered class, but also that members of the potentially cohesive group-centered class would feel freer to express their affect for other class members--that this affect would therefore range further in both positive and negative directions, and thus would show a greater scatter in affect ratings than would be the case for the teacher-centered class. The results are shown below.

**Can be accepted as significant statistically at the 1% level of confidence.

Table 17.

Standard deviations of ratings assigned students in group- and teacher-centered sections on affect scale.

Teacher	SD G/C	n	SD T/C	n	$SE_{diff.}$	CR
A	2.06	522	1.88	501	.089	2.02*
B	1.68	499	1.53	400	.078	1.92

While the difference is in the expected direction for both teachers' sections, and is statistically significant for teacher A's sections, the level of significance was not quite reached for the two sections of teacher B, the confidence level being .0548.

This greater spread in affective ratings among G/C section members, compared to T/C section members, corresponds to the greater spread for G/C sections on estimates of length of the green rectangle, before the group norm is announced, compared to T/C sections (Table 12). Apparently the effect of group-centered procedures, the most important of which is interaction, is to free both perceptive and affective judgments from the sort of social conformity pressure mentioned by Allport (1) that he found dampened extremes in judgments of odors and weights.

One other phenomenon discovered through the use of the affect scale on group- and teacher-centered sections deserves mention. That is the emergence of the group as a perceptual object distinct from the individuals that go to make it up, in both kinds of sections.

*Can be accepted as significant statistically at the 5% level of confidence.

The unexpected finding in the tabulation of these data that led to this conclusion was that in both G/C and T/C sections, the group as a whole* was rated appreciably higher than the average for individuals.

Table 18.

Mean differences between individual's rating of others and his rating for the group as a whole on affect scale, in group- and teacher-centered sections.

Teacher	M_d G/C	M_d T/C	$SE_{diff.}$	CR
A	1.63	.68	.405	2.35**
B	1.87	1.05	.266	3.08***

The most striking difference was for teacher B's G/C section, where the group as a whole got a rating (see affect scale sample, Appendix C-3) 1.87 scale points higher than did the individuals composing it on the average. This suggests that the group as a whole is functioning as a perceptual object that is different from the aggregate of individuals in it. The distinction is more sharply drawn in the G/C sections, as is evident from the table.

*It should be noted here that the group as a whole received a higher affect rating in G/C than in T/C sections:

Teacher	M G/C	M T/C	$SE_{diff.}$	CR
A	3.62	2.00	.492	3.29***
B	3.28	2.06	.381	3.20***

**Can be accepted as significant statistically at the 5% level of confidence.

***Can be accepted as significant statistically at the 1% level of confidence.

VII. WIRE RECORDING OF REACTION TO FILM

While the affect scale provided an index of the likes and dislikes held for each other by class members in the two kinds of sections, and indicated the general level of affect in each, it was felt that some of the deeper emotional consequences of group-centered procedures, as contrasted to teacher-centered procedures, were being neglected. It was possible for example that group-centered teaching fosters sensitivity to the feelings of others and ability to identify emotionally with others, just as group therapy apparently does.

An investigation into the origins of prejudice in children made by Else Frenkel-Brunswik (11) suggests why this might be so. The youngsters who were biased against minorities, she found, tended to have experienced status and power relationships, rather than affective relationships, with their parents. They had a power-oriented dependency on their parents, and were relatively lacking in genuine affective feeling for them. Because they did not receive enough affective support, they could express little hostility or love to the parents, who were seen as providers of needs and agents of punishment.

In contrast to this state of affairs, she found that liberal or non-prejudiced children tended to have experienced love-orientated dependency relationships with their parents. The liberal child himself was less orientated towards power and more towards love. He was able to express hostility and aggression, as well as love, for his parents, because the latter had provided him with the requisite affective support.

The prejudiced child thus tended to relate to others in power and status terms; the liberal child, in terms of affect.

It was suspected while this present experiment was still in progress, and long before results from the affect scale became known, that the main differences developing between group-centered and teacher-centered sections were those relating to the emotional atmosphere therein.

If it were true, as it was thought to be, that individuals in the group-centered sections received more positive affective support and were freer to express their own affect, both positive and negative, than their counterparts in the teacher-centered sections, then this was believed to imply that the group-centered students would be more sensitive to the feelings of others, and would be able to identify themselves emotionally with others more readily. The group-centered student would tend to relate to others in terms of affect; the teacher-centered student would tend to

relate to others, perhaps not in terms of power and status as in the Frenkel-Brunswik study, but at least more on an intellectual level, than would be the case for his counterpart in the group-centered section.

It was thought that these deeper emotional consequences of teaching procedures could best be brought out by letting the classes mull over a striking problem, presented through a film, in the area of personality. It was felt that the individual student would feel it safer to let his true affect come out in regard to a concrete, external problem that the whole class was discussing with him, than he would in a private interview or on a questionnaire, even though the latter should be anonymous. For this reason, the 16 mm. sound film, "The Feeling of Rejection," produced by the National Film Board of Canada, was shown to the four sections involved in our experiment. Each section was asked to discuss, following the showing, the problem of "what made the girl in this film the way she was," with the teacher taking no part. The 15-minute discussion was in each case transcribed on a wire recorder. The discussions for Teacher B's two sections were not recorded properly through mechanical failure, so that typescripts of the discussion were finally obtained only for Teacher A's two sections.

The Educational Film Library Association's summary of the film follows:

> The case of Margaret who at 23 had not yet learned to make decisions independent of her mother. When she goes to a psychiatrist to learn the reasons for her headaches and tired feeling, she reveals that when a child she was afraid of losing the love of her parents and friends and, as a result, learned to acquiesce to all their demands. When she realizes the cause of her trouble, she begins to assert herself and becomes well-adjusted.

It would be well at this point for the reader to acquaint himself with the illustrated brochure of the film provided in Appendix C-4.

The first hypothesis to be tested through the use of the discussion typescripts for teacher A's G/C and T/C sections was a consequence of the general theoretical proposition that the G/C section members would be more sensitive to feelings. The hypothesis was, then, that G/C section members would deal with the problem of the girl in the film, in their discussion, more in emotional than in intellectual terms. In short it was felt they would see the problem as rather of an emotional one, while it was believed the T/C section would look at the problem as an intellectual one. To test this hypothesis through coding, an affect rating scale was devised, with points ranging from 0 for a completely objective analysis, with no feelings expressed, to 4 for a completely feeling-orientated statement, with no objective analysis present. Units for the coding were the participation segments (what a person said at one time in sequence) in the two typescripts.

The results of this coding are given below:

Table 19.

Mean ratings made on participation units by Coder (1) for teacher A's group- and teacher-centered sections, on five-point affect scale.

M G/C	M T/C	$SE_{diff.}$	CR
2.67	1.43	.270	4.59**

The first hypothesis is therefore supported.

The second hypothesis to be tested through coding of the typescripts was a consequence of the proposition that group-centered section students would be able to identify themselves emotionally with other persons more readily than would students in the teacher-centered sections. The hypothesis to be tested is that, as a result of this identification process, the discussion typescript for the G/C section would contain more references to the girl heroine than the typescript for the T/C section. Ideas in the discussion were the coding units.

Table 20.

Proportion of idea units coded in category of reference to girl heroine of film by Coder (1) on typescripts of class discussion for teacher A's group- and teacher-centered sections.

G/C		T/C			
n	Prop.	n	Prop.	$SE_{diff.}$	CR
98	.888	59	.203	.072	9.51**

**Can be accepted as significant statistically at the 1% level of confidence.

The second hypothesis was therefore supported. The implicit hypothesis not tested here is of course that if the group-centered section is as a whole more sensitive to feelings and more capable of emotional identification in connection with a film situation, then it is also more sensitive to feeling and more capable of emotional identification in connection with a real life situation such as the daily meetings of the class.

Since coder (1), upon whose work these conclusions are based, had done previous statistical work in this experiment, it was felt there was a possibility she might have become "contaminated," that is, there might have been some subjective weighting of an unconscious nature on her part. Coder (2), therefore, who was entirely uncontaminated with regard to the experiment, was asked to do a check coding on both codes and the reliability between the two coders was computed according to a formula developed by Guetzkow at the University of Michigan Conference Research Project (14). The theoretical proportion (P_{theor})* of agreement between two coders assumed to have equal ability is calculated at the lower limit possible, given the obtained

$$*P_{theor} = \frac{t^2 + 2nP' \pm \sqrt{(t^2 + 2nP')^2 - 4\,(t^2 + n)\,n\,(P')^2}}{2\,(t^2 + n)}$$

where P' is the obtained agreement between coders. Note that for the 1% level of confidence, employed in calculations for Table 21 below, t must equal 2.58.

proportion of agreement between coders (1) and (2), at the 1% level of confidence. The obtained proportion of agreement (P_{obt}) is of course one sample of the P_{theor}. Agreement is here defined as the proportion of units coded the same way by the two coders, to total units coded. Using this lower limit of P_{theor}, a value for p, the reliability estimate, is derived.* This is the least value p might take 99 times out of 100, given the obtained agreement, the number of units and the number of categories. It should be noted* that when two coders randomly classify material into categories, where k equals the number of categories, the p becomes 1/k. If the two coders are completely accurate (agree completely) then p becomes 1.00. Thus p represents the reliability of the coding.

Table 21.

Estimate of reliability of coding procedures used for typescripts of class discussions in teacher A's group- and teacher-centered sections.

Code	n	k	$P_{obt.}$	$P_{theor.}$	p
Affect	96	5	.417	.297	.479
Reference to girl	62	2	.871	.717	.829

*to obtain p, we must get the roots of the quadratic equation

$$P = \frac{k}{k-1} p^2 - \frac{2}{k-1} p + \frac{1}{k-1}$$

where P is the lower limit of the chosen level of confidence for the theoretical agreement, and k is the number of categories.

It will be noted that the reliability for the affect coding is rather low. To alleviate any doubt as to the validity of the difference found between means for the two sections on this scale by coder (1), the coding of coder (2) was used to compute these means, and the results compared:

Table 22.

Mean ratings made on participation units by coders (1) and (2) for teacher A's group- and teacher-centered sections, on five-point affect scale.

Coder	M G/C	M T/C	$SE_{diff.}$	CR
1	2.67	1.43	.270	4.59**
2	1.63	.65	.208	4.71**

Thus although the means on this scale for both G/C and T/C are consistently higher for coder (1) than coder (2), nevertheless the difference between means as between G/C and T/C is just about the same for both coders and the critical ratio of the difference between means over standard error of the difference is about the same. Therefore despite its low reliability the affect scale coding presents evidence of a real difference between the means of the two sections with respect to it.

Another estimate of the reliability of the coding procedure was obtained by comparing the actual agreement found between coders (1) and (2) with that to be expected purely by chance.

**Can be accepted as significant statistically at the 1% level of confidence.

Table 23.

Agreement obtained between coders (1) and (2) in using two codes for discussion typescripts of group- and teacher-centered sections, compared to agreement that would be expected by chance if the units had been randomly assigned to categories by each coder.*** Agreement between the two coders is expressed as proportion of units coded the same way by the two coders to total units coded.

Code	Prop. obt.	Prop. by chance	$SE_{diff.}$	CR
Affect	.417	.200	.0648	3.35**
Refer. to girl	.871	.500	.0764	4.86**

A third theoretical proposition formulated with regard to the consequences of the two kinds of teaching procedure, was that group-centered students would develop better insight and understanding with regard to the personality problems of others than would teacher-centered students. A testable hypothesis derived from this proposition was that the typescript of the 15-minute discussion for the G/C class would evidence better clinical insight into the problem, "what made the girl in this film the way she was," than would the typescript for the T/C class. It should be recalled here that the course content, organization, assignments and role-playing situations were exactly the same for both G/C and T/C sections, of the same teacher.

**Can be accepted as significant statistically at the 1% level of confidence.

***when coders are "unskilled and randomly classify the units into the categories," then the theoretical proportion of agreement between two coders becomes 1/k, where k equals the number of categories (14, p. 11).

The typescripts were therefore submitted to two clinicians on the staff of the Department of Psychology at the University of Michigan with instructions to evaluate the degree of clinical insight of each group. The evaluators first read the synopsis of the film presented above, p. 62 and examined the brochure (Appendix C-4). They knew nothing of the purpose of the experiment and nothing about the nature of the two groups except that the latter were classes.

The reports of the two clinicians, Drs. Daniel Miller and Max L. Hutt, are given in Appendix C-4. The two sections appear so different from their evaluation, after 14 weeks (three hours a week) of student-to-student interaction in one, and teacher-student interaction in the other, that they are scarcely recognizable as having come from the same general population. Indeed Dr. Miller denies that they are from the same general population, intimating that the G/C section is not a psychology class at all.

The reports of the two clinicians agree that the G/C section displays better clinical insight into the problem presented to it. Dr. Miller comments that this section seemed to be "less frightened by the issues of the film," taking it more seriously and less defensively than the other section; he adds that this section "discussed the real issues, not abstract words like 'psychoneurotic'". Dr. Hutt felt that this group was "sensitive to the expression of feelings, types of mechanisms used to deal

with conflicts and the varied and inter-related aspects of behavior of the 'heroine'".

The evaluation of the T/C section from the discussion typescript by the two clinicians also runs along parallel lines. Dr. Miller comments that "the group could never get away from labelling with 'black' names and thus was not enabled to cope with issues." Dr. Hutt remarks, "Little insight is shown by (most) members into the underlying dynamics. Major concern is with descriptive symptom elucidation and nosological considerations. As a group, this group shows far less understanding of the 'heroine's' difficulties."

It is difficult to account for this difference in sensitivity to feelings, ability to identify and ability to get insight and understanding into personality problems, between the G/C and T/C sections of teacher A, solely in terms of the major procedural variation, interaction. Emotional sensitivity and identification seem psychological processes of a higher order than those measured by the green rectangle and by the affect scale; the two latter instruments appear to measure processes that are more easily related to interaction than are those we are now concerned with. The explanation can be hazarded that interaction lays the groundwork for emotional sensitivity and identification, by providing a relatively high level of affect in the G/C section, thus providing the necessary but perhaps

not the sufficient condition for the existence of the higher order processes.

VIII. STIGMATA OF COHESION

It will be remembered that on p. 12 above, it was stated in regard to cohesion that the latter means the group has developed an integrity of its own; the cooperative mechanisms of interaction have been developed that enable it to maintain itself as a group in a new situation and to go on to act as a group. A second major reason for the recording of the 15-minute discussion following the showing of "The Feeling of Rejection" in both G/C and T/C sections of teacher A was to determine what "stigmata of cohesion," related to the above definition of cohesion, could be observed in the behavior of the two classes as recorded. For this purpose, reference will be made to the two typescripts of the class discussions, the evaluation of these typescripts by Drs. Hutt and Miller (Appendix C-4) and teacher A's record of the two discussions in his class diary (presented below, p. 73).

The effect of lack of training in student-to-student interaction in the T/C section can be seen in the typescript. The T/C group seems to react in the discussion situation like a spinal animal: it simply has no mechanism for interaction, or for maintaining itself as a group. For example, no discussion takes place for the first 4 minutes and 30

seconds. After this period a mechanism for interaction finally emerges in the person of 64, who takes over as leader and interviews class members. Dr. Hutt (Appendix C-4) comments that this man "dominates the group, stifles spontaneity, leads them to intellectualizing and label-pinning." Dr. Hutt may here be blaming 64 for class characteristics which are an end product of the particular teaching procedure used, but his remarks have this much force: it was this kind of dominative leader who arose in this kind of group, and as shown by the affect scale (Appendix C-3) summary, this man was third in popularity rank among his classmates.

Coding of the participation units for this section's typescript by coder (1) showed that .163 of these units contained at least one reference to group process or the mechanics of discussion, while none of the participation units for the G/C section could be thus coded. The reliability of this coding (see p. 64 for explanation) was .943. This is simply more evidence that the T/C section was creaking at the joints in its efforts to hold a group discussion.

The discussion itself did not accomplish much, in fact it wandered pretty far away from the problem presented by the film at times. The topic being taken up at the end of the 15 minute period was concerned with membership in political clubs and fraternities on campus. Of the idea units coded by coder (1) for this section, .932 contained a

reference to new material (that is, not a rehash and not an interpretation of something that happened in the picture). The corresponding proportion for the G/C section of references to new material was .357, the critical ratio of the difference between proportions being 9.83**. The reliability estimate of this coding was (see p. 64 for explanation) .749.

The comments of teacher A in his class diary are pertinent here:

> May 17. T/C: Dead silence after film; gradual breakthrough. 64 assumed leader-role since no one appeared to be talking. Noticeably in contrast to other group, where people spoke out rather spontaneously. 9 were absent and noticeably so; quite contrast to other class (where 3 were absent, 2 came in very late but didn't seem to care).

Dr. Hutt comments on the group as a whole: "The group is insecure, aggressive, and formalistic." (Appendix C-4)

In contrast to the T/C section, the G/C section begins its discussion 1 minute and 15 seconds after the microphone had been opened. Prior to this official opening there had been some private conversation of a bantering nature:

Do you feel rejected?

Yeah (laughter).

Then the G/C section starts discussing the problem right away and stays with it. The last topic at the end of the 15 minutes was the relationship of the film 'heroine' to her little sister. As was mentioned on p. 72, there were no

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**Can be accepted as significant statistically at the 1% level of confidence.

references to group process or the mechanics of discussion in the typescript. As Dr. Miller comments, "No one dominated the discussion or prompted others.**More questions were asked. An attempt was made to answer each by the group as a group." Dr. Hutt remarks: "Most of all, I'd like to comment on the marked degree of inter-action and spontaneity of the group."

Here are the reactions of teacher A, as set forth in his class diary:

> May 17. G/C. Got them sitting around (closer) for mike purposes--good discussion. Continued until end of hour. Much deep insight. Quiet background, one talked at a time. No attention paid to me at all (in contrast, it should be noted, to T/C section, where I was the object of attention for a long time). Had to wait my turn to speak (in discussion after recording had been finished). Participation about 12 out of 22.*

In summary then, after 14 weeks of interaction, the G/C section has developed within itself the mechanisms for maintenance of interaction. It can act as a group in the discussion and does not need a leader or a leader-substitute. This section can now maintain its own integrity in a new situation.

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*Thus 57% of the 22 present in the G/C section took part in the discussion. In the T/C section, 9 of the 16 present took part, which represents a figure of 56%.

IX. THEORETICAL IMPLICATIONS

This study has so far suggested that student-to-student interaction is a major factor* in the production of cohesive behavior, as herein defined, in classroom groups. It has also been suggested that interaction experience in the classroom group influences the perception of length of a rectangle, even before the class average is known. It has further been indicated that interaction in a group situation probably increases the average level of affect, causes greater dispersion of affect, and is a factor in the emergence of the group as a perceptual object. It has also been suggested that an end-result of interaction is to make members of group-centered classes more sensitive to the feelings of others, more capable of emotional identification with others, and to give them better insight into the emotional problems of others. The green rectangle was used to measure the perceptual effects; the affect scale, the simple emotional effects; and the wire record of reactions to a motion picture, the higher-order emotional

*The causal relationship between interaction and group cohesion has been strongly suggested, but not established, by the present data. It can be suggested that interaction is probably a necessary condition for cohesion, since not much cohesion was evidenced without it; but it cannot be shown through the evidence at hand that it is a necessary and sufficient condition. The friendliness of the teacher, maintained in both kinds of section, may also be a necessary condition for cohesion, but not sufficient to produce it in a classroom group without interaction.

processes arising from group-centered procedures that lead to cohesion in a classroom situation.

A theoretical explanation of the perceptual and emotional resultants of interaction is now in order. These effects and their apparent cause must be related in one comprehensive theory of group cohesion.

Interaction at first seems to be from a different universe of discourse than perception. One is somehow social, involving interpersonal relationships and affect; the other is rather an individual matter, involving introspective and intellectual activity.

How could interaction in the group-centered class influence the perception of a rectangle before the class average is known? The hypothesis presented above, p. 38, is that the potentially cohesive group situation frees the individual from the restrictive effects of pressure for social conformity that obtain in a teacher-centered group, and in the kind of group Allport used--both being kinds of groups where little or no interaction has occurred among the members.

Thus in the group-centered class the individual is freer to make the same kind of more extreme estimates of rectangle length than he would make if he were alone. That is, when the individual makes his estimates in a group with which he has experienced little interaction, such as a teacher-centered class, he may consciously or unconsciously

feel defensive and hypercritical about his own estimates. Not having interacted with his own fellows, he is not certain of their intentions towards him and is inclined, in a competitive situation, to suspect the worst. We may find that the individual's gestures and other movements are restricted and that there is a general shrinkage and closing of the organism as it prepares to resist a presumably hostile environment, in the manner that Soskin was among the first to describe (6).

This lack of expansiveness in gestures, speech and the whole style of movement of the organism, as part of a general defense syndrome, may be the mechanism behind the phenomenon found by Allport in his groups, and by the present experimenters in their teacher-centered sections, namely that the extremes of judgment have been dampened. The conclusion is that interaction and the consequent release of tension among individuals in the group-centered classes have counteracted the effects of what is ordinarily termed social pressure, so that the individual can be himself in the group. The dampening of extremes in the teacher-centered group may be part of a general restrictive pattern imposed on bodily functions by the defense syndrome, as this pattern affects the unknown physiological determinants of perceptual length.

An explanation has been presented of how interaction among group members can alter their perception of the length

of a rectangle. But how can interaction make group members like each other better?

It may be considered that the process of interaction, defined operationally as the percentage of remarks made by members of the class that are directed to each other rather than to the teacher, "breaks down barriers" between people, as one student in a 1949 G/C class at the University of Michigan put it recently. These barriers are the hostile autisms projected onto others by insecure people (and does that not include all of us?) in a competitive industrial society. As Newcomb, who originated this theory, puts the matter in a provocative article (24): if the other is perceived as hostile, he will be reacted to as hostile regardless of what his real intentions may be. In interaction, however, the individual has a chance to test his perception of the intentions of the other, and, if it can be assumed that such perceptions of the hostile intent of the other are distortions due to insecurity in a competitive situation, and are not expressions of any fundamental dislike of people for one another, then it is safe to assume the individual will shortly modify his erroneous percept of the other's hostile intent towards himself. Interaction then is the catalyst that produces this remarkable change in the chemistry of interpersonal relations: the crystals of hostility dissolve and the bright crystals of friendship begin to form.

The assumption here is that fundamentally people like one another. This may be thought of as a generalization of response to the persons who first meet the infant's needs in our culture.

In a competitive society, people are apt to get isolated and become defensive. The interaction breaks down hostile autisms and defensive attitudes. The organism no longer needs to maintain its defense syndrome, or what Selye at the University of Montreal has termed the alarm reaction (8).

Selye and his co-workers argue that the alarm reaction represents a general defense against sudden stress in many higher vertebrates, including man, and is accompanied by specific changes in the chemical composition of body tissues and fluids, largely through over-secretion of adrenal and pituitary hormones. The alarm reaction seems to be a "non-specific reaction to general damage as such," (8, p. 20) from the work they have done with animals. While these investigators confine themselves to the physiological level, finding that the pituitary gland (anterior part) is in command of the alarm reaction, and that stress acts on the anterior pituitary "through some unknown pathway," (8, p. 21), this system can be envisioned as being set in operation by psychological stress, such as loss of love, or competitive insecurity.

Thus it is suggested that the positive affect between individuals fostered by interaction makes unnecessary defensive attitudes of the individual, enables him to do without his defensive shell, and incidentally without the chemical and physiological effects of the defense syndrome, probably similar to the effects of Selye's alarm reaction.

If it is accepted that interaction enhances positive affect in interpersonal relations, then implications follow for other areas besides that of classroom procedure--for the area of racial relations, for example. These implications will not be discussed here.

The present writer was unable to derive any satisfactory theoretical explanation for the fact that the group as a whole was liked better than the average of the individuals in both group- and teacher-centered sections, with this effect considerably more enhanced in the G/C sections. It is clear, however, that this phenomenon indicates that the group is perceived as a separate object, and not as a collection of individuals.

The relation of interaction to higher-order emotional processes, such as sensitivity to feeling and identification, is not as clear-cut as is the relation of interaction to percept and simple affect. The work of Frenkel-Brunswik (11), as has been noted previously (see p. 59above) suggests that such processes depend on affective support for the individual and on his having had affective relationships

of both the positive and negative variety with people he must depend on. It can only be repeated here that interaction, in raising the level of affect for the group-centered section, provides the necessary but perhaps not the sufficient condition for emotional sensitivity and identification.

Possibly individuals in group-centered sections are more sensitive to feelings because the defensive barriers are down, and the individual can feel and respond to the other's emotions. Physiologically it would seem awkward if not impossible to sympathize and be hostile at once, since these emotions probably involve two different divisions of the autonomic system; and psychologically sympathy and identification are, as Fromm suggests, essentially a re-affirmation of the existence of the object, while hostility is a wish for its removal or destruction (12).

Emotional identification, or taking the role of the other emotionally, is probably also facilitated once hostile projections have been cleared away in the relationship between people.

Fear and anger reactions must be under control before one can take the role of the other emotionally as well as intellectually*.

* * * *

*The intellectual process of taking the role of the other is the key concept in G. H. Mead's theory of social behavior (22).

The essential physiological mechanism in the development of group cohesion is apparently, then, the relaxation of the bodily defense syndrome. The essential psychological mechanism is the taking over the role of the other emotionally.

The emotional atmosphere of the potentially cohesive group-centered class is rich, spontaneous and creative. Examples of this spontaneity for teacher A's G/C section, probably the most cohesive of all four involved, are the psychodrama the class pulled on unsuspecting teacher A, to his anxiety and alarm; the water pistol incident at breakfast, and one classroom session where a student led off a rather imaginative discussion of statistics by remarking, "You be a sigma and I'll be a mode."

Teacher A's class has emotional depth that can be sensed even from a typescript of a 15-minute discussion. In this group, the sparks from interaction among students have cleared the atmosphere, and the delicate lines of force of positive feeling have gradually established themselves. Defensive reactions are no longer needed. Once the defensiveness has been removed and the level of affect raised, then emotional cross-identification within the group can occur, as suggested by Hutt (15). This consideration of the other's feelings cannot come while defensive barriers remain. Once they are down, the individual becomes less restricted in his perception and in his feelings, and

relates himself to the group as an area in interpersonal relations where he needs no defenses.

For the individual, the group becomes an area of living where he can be spontaneous, where he can momentarily regress to infantile behavior, and where he can recapture freedom to be himself from its long thralldom to social pressure. In the potentially cohesive group, where his energies are not deployed to attack or defense, the individual can find freedom from social conformity pressure and turn his energies to creative channels.

The integrity of the group, the fundamental cohesive force, is much more than the positive affect among individuals: it is the emotional taking of the role of the other, the ability to experience even as a pale reflection the inner delights and terrors of others.

The group through interaction has learned how to be cohesive; it has established the channels of communication, and differentiated leadership roles. But the individual members of the group want to maintain it as a unit, to keep it cohesive, because for them group is a place where the individual can be himself, without defenses, where the fundamental defensive anxieties of our culture can be assuaged, and where the fundamental hunger to like and be liked can be satisfied.

The fundamental process of the development of group cohesion is the increase of interaction through reinforce-

ment of it by the rising tide of positive affect within the group. The increased interaction in turn raises the level of affect. When the latter has reached a certain level for the group, through this circular process, cross-identification, the fundamental cohesive force, develops. This force in turn channels and accentuates the interaction. At this stage the group has developed both the mechanisms for maintenance of its own integrity, the know-how, and the motive force that, operating through the individual, maintains it as a group.

X. SUMMARY AND CONCLUSIONS

The problem was to develop instruments of measurement for the teaching procedures that, it was believed, would lead to group cohesion. The latter is here defined as the ability of the group to maintain itself, and to act as a unit.

The procedures believed to lead to cohesion were termed group-centered: they involved encouragement of interaction among students, group decisions, and the teacher in the role of a member of the group. Two experimental sections from the elementary psychology course at the University of Michigan, taught with these procedures in the Spring of 1948, showed evidences of group cohesion at the end of the semester. Two sections of the same course matched to the first two were taught with teacher-centered methods, where interaction was kept channelled between teacher and individual student, no group decisions were permitted, and the teacher assumed the role of leader. The course content was the same for both kinds of sections, and the two teachers involved (each with two matched sections) were instructed to be equally friendly in both sections. The two teacher-centered sections showed little if any evidences of cohesiveness at the end of the semester.

Several techniques, themselves separate from the teaching process, were devised to evaluate the two kinds of teaching procedures used. The work of Sherif with the autokinetic effect led to the design of the green rectangle, a perceptual measure for the teaching procedure used: the rectangle was used to measure the influence the group average had on the individual's estimate of rectangle size. From work in group therapy by Slavson and others in the last few years, it was felt likely that some emotional effects obtained in group therapy would likewise be manifested in the group-centered teaching situation. An affect scale was designed to measure the likes and dislikes of group members for each other. A situational test was arranged, consisting of a 15-minute group discussion following showing of the film "Feeling of Rejection." This discussion was recorded on wire and analyzed for evidences of deeper emotional consequences of group-centered procedure.

The three instruments devised were administered toward the end of the semester.

Conclusions follow:

1. Group-centered teaching procedures lead to the development of group cohesion as it has been here defined.

2. Student-to-student interaction is a major factor in production of cohesion in the classroom situation. While it is a necessary condition for cohesion, there is no evidence that it is a sufficient condition for cohesion.

3. Estimates of length of a rectangle made by a group-centered class will change more in the direction of the group average, once that average has been announced, than will estimates of a teacher-centered class towards end of a semester.

4. Dispersion for initial estimates of length of rectangle will be greater in group-centered than teacher-centered sections at end of semester.

5. The average level of affect will be appreciably higher in group- than in teacher-centered sections at the end of semester.

6. Student-to-student interaction in the classroom situation apparently causes the affect level to rise.

7. Students in group-centered classes and teacher-centered classes will rate the group as a whole higher on the affect scale than they will the individuals in the group as an average. The disparity is significantly greater for the group-centered sections.

8. Dispersion of affect scale ratings of each other by students will be higher in group-centered than teacher-centered sections at end of semester.

9. Students in a group-centered class at end of semester are more sensitive to feelings, more capable of emotional identification with other persons and more capable of understanding personality problems than students in a teacher-centered class.

APPENDIX A. Negative findings

A number of instruments, designed to measure teaching procedures leading to cohesion, failed to discriminate between the group- and teacher-centered sections at a satisfactory statistical level. In general the criterion used was that unless the instrument showed a significant difference between both pairs of sections at the 5% level, it was rejected.

1. Projective tests. These were of an elementary nature, designed to determine whether the kind of teaching procedure used had any measurable effect on certain personality characteristics, such as compulsive conformity.

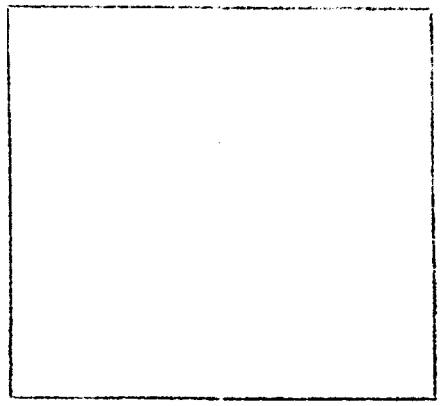
a. Square and circle test (see sample). The hypothesis: that the students in the group sections would show a higher standard deviation for the length of the lower horizontal line in their reproduced square than would students in teacher-centered sections. An F-test showed that teacher B's G/C section had a greater variance than his T/C section, the difference being at the 1% level of confidence. Another F-test showed that teacher A's G/C section had greater variance than his T/C section, as expected, but that the difference was not at the 5% level of confidence. These results indicate that further work with this test might be profitable.

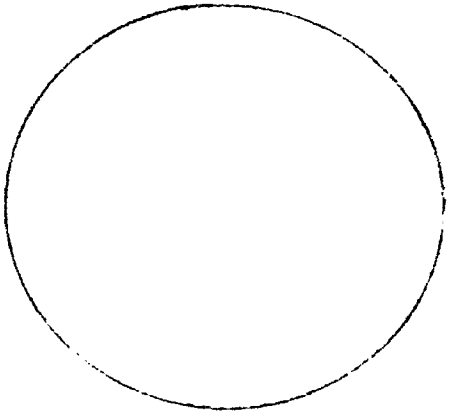
b. Make-a-picture test (see sample). Hypothesis, that students in the group-centered sections would, in making their drawings, feel freer to go outside the boundaries of the ambiguous figures on the test, than would students in the teacher-centered sections. The difference between the G/C and T/C sections of teacher B was significant at the 5% level of confidence, but it was in the opposite direction from that expected. The T/C students went outside the boundaries more than did the G/C students. There was again no significant difference between the T/C and G/C sections of teacher A.

2. Progress evaluation scale. Exactly the same scale sheet is used as for the affect scale (compare Appendix C-3) but the instructions are to rate people in the class in regard to how much they have helped or hindered class progress (see instructions and sample). The first hypothesis tested with the use of this instrument was that there would not be as great a disparity between the individual's self rating, which was where he wanted to be in the eyes of the group, and the actual rating given him by the class, in the group-centered sections as in the teacher-centered sections. No significant difference between G/C and T/C sections was found in this regard. The second hypothesis was that there would not be as great a disparity between the individual's self rating on the scale, which was where he wanted the group to put him, and his estimate of where

number:_____
ion:_____
uctor:_____

Instructions: please make a free-hand drawing of the square and circle below, in the space provided on the bottom half of this sheet.

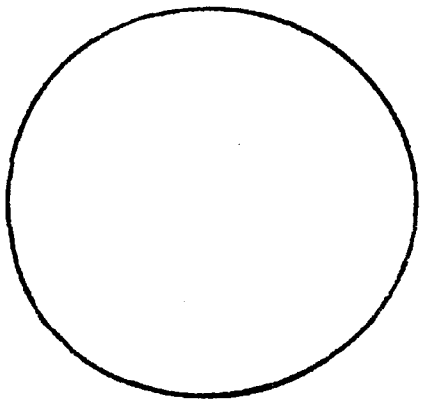




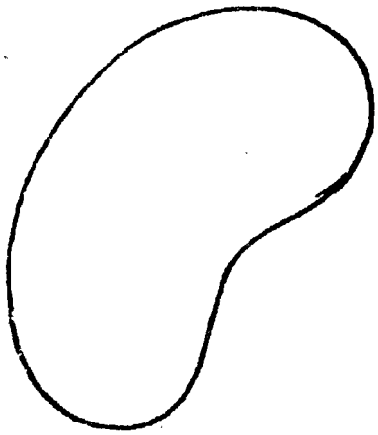
TAKE-A-PICTURE EXERCISE

number:*_____
tion:_____
tructor:_____

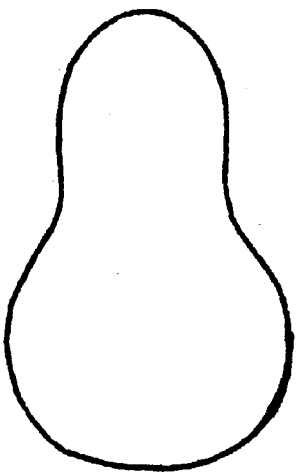
Instructions: Using each of the four figures below, draw something and name it.



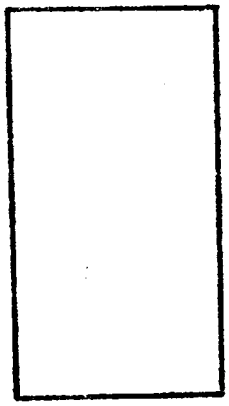
What is it? _____



What is it? _____



What is it? _____



What is it? _____

Progress Evaluation Scale

INSTRUCTIONS:

1. Although this is the same scale you used before to rate your likes and dislikes, we are asking you today to ignore your personal feeling in making these ratings.

2. We want you to rate each member of this class in regard to how much you think he has helped or hindered class progress. Zero rating indicates in your opinion this person has neither helped nor hindered progress. A rating of +5 means he has contributed a lot to the class progress; a rating of -5 means he has blocked class progress a lot. Be as objective as possible.

3. IF YOU ARE NOT SURE about some people (VERY IMPORTANT) simply UNDERLINE their names and DO NOT RATE THEM.

4. When you come to <u>your</u> name, please rate yourself where you <u>would like</u> to be in the eyes of the group on this scale.

R NUMBER ______ CTION ______ STRUCTOR ______	DID YOU FEEL YOU WERE A PART OF THIS GROUP? 0 ... 5 no ... very much	GROUP'S IDEA OF YOU. where group will put you on this scale. -5 ... 0 ... +5	GROUP AS Whole -5 ... 0 ... +5
ussell Alexander	Bill Graves	William MacMillan	William Pavelich
im Amerman	Tom Harkness	John Macrides	Don Redfern
oanne Auch	John Hathaway	Ann Mainland	Alvin Rottman
arianne Averill	George Hess	Matt Mann	Sammy Robley
avid Bailey	Mary Horafakis	Ted Maycroft	Paul Schaible
argaret Bevan	Burton Kelly	Art Nevins	George Serbinoff
oug Covert	R.D. Kingsbury	Nancy Nothagel	Constance Skaff
im Eatmon	David Leddick	Ruth Oestreicher	Carole Somer
erald Flury	Melvin Lederman	William O'Hern	Ralph Stratton
obert Graham	Ileana Lindh	Ralph Olivanti	Lawrence Stratton
		Charles Vaughan	Robert Wylie

the group actually would put him, in the group-centered sections as in the teacher-centered sections. No significant difference between G/C and T/C sections was found here, either.

The value of this scale is in question, since it correlated .72 with the affect scale, and it is deemed to measure much the same thing as the affect scale, despite the difference in instructions.

3. Autobiographies. Both at the beginning and end of the semester, students in teacher A's G/C and T/C sections were requested to submit brief anonymous autobiographical sketches, identifiable only by a secret code number known to the student. The hypothesis was that students in the group-centered section would, after a semester's experience in this kind of class, introduce more interpersonal relationships in writing up their own life histories than they had at the beginning of the course. Coder (1), using sentences as units, coded the number of sentences that contained any references to interpersonal relations in the papers. There was no statistically significant change over the semester in number of interpersonal references in either section.

4. Content measures. It will be remembered that the course content, organization and assignments were the same for T/C and G/C sections.

a. Two comparable tests of 20 multiple choice items each were administered by teacher A to his two sections

before the final. The T/C scored higher on both, the difference being significant at the 1% level of confidence on the first test, but not attaining statistical significance on the second. Two forms of the final (multiple choice objective type) were administered to the four sections involved in this experiment, approximately half of each section being assigned to form 1, and the other half to form 2*. There was no significant difference between the means of teacher A's two sections on form 1 or form 2. The T/C section was slightly higher on form 1, the G/C section was higher on form 2. There was no significant difference between the means of teacher B's two sections on form 1, although the T/C section was higher, but teacher B's T/C section scored significantly higher than did his G/C section on form 2, the difference between means being acceptable at the 1% level of confidence.

b. Students of all four sections were asked to check a list of psychology courses offered in the department to indicate which ones they would like to take in the future. There was no statistically significant difference between T/C and G/C sections here.

*A small number from each section, about four or five, took a third form of the final before the regular examination period to avoid conflicts in examination schedules.

c. Towards the end of the course, students were asked to note down anonymously how many hours they had studied for the course in the past week. There was no statistically significant difference between T/C and G/C sections in this regard.

APPENDIX B. Anecdotal evidence of group cohesion

1. Extracts from daily diary maintained by instructor A which are suggestive of the status of group cohesion in the group-centered and teacher-centered sections taught by him. Numbers are code listings for individual on affect scale summary (see Appendix C-3).

Feb. 19, 1948

G/C: Events: chairs not arranged in circle. One student moved (some). One student suggested that party be abandoned. Others: let's see. Then another suggested that seats be in circle. Two volunteered to make arrangements (to see that they were in circle each class period).

Feb. 27

G/C: Gave lecture on correlation to both groups. Then psychodrama. Criticism friendly. More acceptance. Willing to stay overtime (second time in a row). Attendance low.

T/C: More attack on individuals (by class members). More attempt to understand in rational or "good or bad" terms. Group has not accepted members. Not willing to stay overtime (second time in a row). Attendance still about perfect.

March 5

T/C: Psychodrama kept going after class.

March 30

G/C: Class pulled psychodrama on me! Concealed selves, pretended not (to be) there (note: class left behind two or three observers to note my reactions, which were ill-concealed). I got anxious, reacted aggressively. Committee appointed (following discussion) for class party and for breakfast session (at Michigan League cafeteria). 35 chairman.

T/C: Class in rebellious frame (of mind) but would not stand (for) or could not direct attack on me. 58 etc. sore because reading (text) book was not enough. 45 protesting that principles wasn't clear and that I should lay down the law. I refused. Too much groupiness entirely: will have to emphasize (my own) IP relationships (with class). Did not laugh at reference to sex in my lecture, as did other class.

April 16

G/C: Breakfast at League. About 19 or 20 on hand. All waited for me: ate as a group. Discussion until 8:45 then some talk on ego, and finally sex.

T/C: (I was) little bit late. Three people ready (had already started) to leave: 48, 50 and one other. Kidding, etc. Too much group spirit. Will have to crack down pleasantly next time. Judge that there's permissive atmosphere, but not too much cohesion yet. Let's keep it that way. MORE INDIVIDUAL INTERVIEWS: BRING PAD.

April 26

G/C: Somewhat restricted technique; put material on board, lecture on pp. 37-39*. Surprisingly enough, got a good discussion thereafter.

T/C: Same material. Discussion not restricted enough; quite. One or two people (58, 54) still want to go outside (have class on lawn).

April 30

G/C: Meeting (for breakfast) in League: nothing much first 30 min.; deprivation psychodrama (here class pulled psychodrama on me by watching my reactions when 41 took my breakfast away). Water pistols--32 and 23 "shot" 35 (note that 32 was organizer of March 30 incident and chairman of psychodrama committee; 35 chairman of party committee).

T/C: Psychodrama. 50 still in favor of going outside. He, 58 and 54 have to be slapped down every other period, but individually!

May 14

G/C: Had to give crime essay; spoiled meal somewhat (breakfast in the League). Only 18 there. Not too good psychodrama.

T/C: Used time to talk about kind of class, exam, etc.; rather stalled. Only about 19 present. 50 again wanted to go out (to League, I suppose) for coffee.

May 19

G/C: Green rectangle; second instrument. More enthusiasm on party, etc. $7.50 contributed (at 50¢ a head). Discussion of Negro problem. No final agreement possible.

T/C: Green rectangle; second instrument. Negro discussion. Less variance, more liberality here than in other class.

May 20

Visit from 32: to have psychodrama on white girl dating Negro boy and to write essay (this was an optional assignment). States class has "been talking about reunion."

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*Text was, Woodworth and Marquis, Psychology. New York: Holt, 1947.

May 21

G/C: Ate at League; good psychodrama and discussion. Arrived at solution for Negro-white dating problem: go to parties with small mixed racial group to break down intolerance (instead of Negro-white couple going by themselves). 22: ought to have reunion next Fall. Girl (41): Breakfast Club. A's Breakfast Club. Projective tests; third instrument.

T/C: Psychodrama same as 32's. Went across well. Conclusion arrived at with more difficulty—apparently nature of group involved here. Projective tests; third instrument.

May 24

G/C: Affective relations tests; wrapped up personality. Discussed party. About $11.50 collected (total of 22 contributions). 32 was concerned about me: get you in trouble? Diagrams on board (road map). 38 and 35 attending to refreshments.

T/C: Affective relations--questions asked by 53 (insecure), and by 58 (had reversed all ratings). Personality lecture seemed dead.

May 25

G/C: Class party 7 to 10:30 P.M. 17 members of class attended. Presented me with ring that squirted water (as remembrance); looked to me to start things, but wouldn't. Gatherings in kitchen with males, sex jokes. Wonderful entertainment by 32's friends (from outside class): Wym Price, (atomic blues) and quartet. Did conga, etc. 29 leading Hoki Poki. 32 dancing madly with girl (39's fiancee) et al. 38, 30, quiet in a corner. 35 finally broke through to sing "What I like about the South." 22 and nice wife there. 24 bringing her brother and sister. 35 worried about attendance. 21 breaking through; did not dance (?). Psychodrama: 29 as me, 23 as herself, as she necked him for an "A." (Party ended with group singing led by 32's quartet).

May 28 (final class meeting).

G/C: Last session. Breakfast at League: few at first. Later 23 there (meaning?). Laughing and joking on future courses, check on tests, etc. Good spirit. Not much interested in results (a general explanation was offered of the entire experiment). 34: get there quicker by more committee work. During remaining minutes--32: I move we have reunion. Flurry of hands. I asked re-check. Most raised hands. I suggested have secretary: 23 named. 20, 40 offered houses. Post-cards to be sent. 33 insistent although she didn't

attend first party. Several (34 especially): should have had party earlier. I: up to you. 34: more pushing by you. I: not good for group. In general: high conversational level. Only 37 reading newspaper this time. No real farewell on either side. (Sense of meeting seemed to be) group would continue. After class: 36: "Good course, _____(A's first name)."

T/C: Last session. Routine procedure--future courses, instruments, check, group attitude scale (same as G/C). 58 asked questions again. Then exposure of experimental design: told them had to have control (and they were it). Some feeling (in class) there might be group here too: yes, 48. Same as any other classroom, 58, 51, 45. (Class) anxious to leave (restless towards the end). Let them out a few minutes early, as it no longer mattered. After class: 54: "Unable to believe it's all over. Feel lost."

2. Spontaneous behavioral indications of amount of group cohesion in teacher A's group-centered section after semester had ended (no member of teacher-centered class either suggested a reunion at any time, or called at A's office after the final examination period).

Oct. 22, 1948
G/C: Committee for party met in A's office: 23, 32, 38, 20.

Oct. 27
G/C: 23, 32, 20 and 29 met and presented a psychodrama for benefit of A's new section in elementary psychology.

Nov. 29
G/C: Scheduled reunion at League. Only 23, 32, 34 showed up, although all members notified. No further contacts with class members since then, as of April, 1949.

3. Spontaneous behavioral indications of amount of group cohesion in teacher B's group- and teacher-centered sections. These are extracts from a record kept by teacher B.

G/C: At one early meeting, someone suggested that group "go to League for some coffee." Group did so after a brief discussion. At another meeting, seats were not in a circle (as had been decided they should be by class). Group moved them in circle. On two occasions, the class on its own initiative agreed to have class outside.

T/C: Only once did a member of the class suggest going outside and his suggestion was received with apathy.

APPENDIX C-1. Measurement of Procedural Variations

1. Interaction Observation Sheet
2. Student Opinion of Teaching scale

1. INTERACTION OBSERVATION SHEET

Section____Observer_____Time of class meeting_____

Instructor_____Date_____Instructions: record each response. If any person talks longer than one minute, record the length of his speech. Draw a vertical line every five minutes and record the time, also record time of beginning and ending record. Write "decision" or "consensus" each time a decision of the group or consensus is reached. Write "outburst" when several people are talking at once.

Categories:

A. To whom speaking
   S--Student
   T--Teacher

B. Person speaking
   T--Teacher
   1--Student
   2--Student, etc.

To whom speaking_____

Person speaking_____

Response_____

To whom speaking_____

Person speaking_____

Response_____

To whom speaking_____

Person speaking_____

Response_____

ANECDOTES OR REMARKS ABOUT:

A. Teacher's role

G. Group atmosphere

STATISTICAL SUMMARY:

Person Speaking: Ratio of successive student responses to total student responses= /

Person Spoken to: Ratio of student to student to total student responses= /

2. STUDENT OPINION OF TEACHING
Psychology 31
1947-48

College or school_____ Last semester's grade point average_____

Department_____

Course number_____ Class (ring one) Fr. So. Jr. Sr.

Section number_____ Grad. Special

Instructor's name_____

Grade your instructor A, B, C, D, or E on the following items. Qualify the grade with a plus (+) or a minus (-) if you wish. Omit inapplicable items and those on which you do not feel competent to pass judgment.

1. Clarity and thoroughness of presentation of subject matter._____
2. Regularity and the adequacy of meeting class obligations, evenness of assignments, return of papers, etc. _____
3. General approachability and willingness to assist students._____
4. Intellectual honesty, openmindedness, tolerance of differences of opinion. _____
5. Fairness of grading on test and course work. _____
6. Ability to arouse interest and stimulate thinking. _____
7. Contribution of this course to your education. _____
8. Considering everything, rate this instructor's general teaching effectiveness. _____

Comments: Specific comments (favorable and unfavorable) on the instructor and course will help in the interpretation of this evaluation.

APPENDIX C-2. Procedure for green rectangle

1. Introductory remarks: "Like your cooperation in an experiment on perception today. Will want you to judge as accurately as possible the length of a green rectangle to be shown you. Make judgments in inches and mark them on a small slip of paper but don't sign your name. We will make another judgment in four minutes to see what effect the time interval has on your perception. Are you ready?" (Wait for general assent.)

2. Show rectangle for 30 seconds.

3. Place rectangle face down on desk. Ask student picked at random to collect slips and read them off. Try to get him to read them off from his seat or in the class without telling him you want the class to hear; but if necessary (if he approaches desk) say, "Let the class hear, please." Compute exact average by short-hand and ignore fractions (i.e., $6\frac{1}{2}$ equals 6). Announce average clearly and loudly BUT as if it were a by-product, then proceed by saying (regardless of exact time elapsed): "Well, I see the four minutes is just about up."

4. Present the rectangle for 30 seconds again, remarking, "Judge as accurately as possible, please." Do not reveal actual length, or answer questions. Collect slips, place in separate envelope, with the original short-hand distribution.

APPENDIX C-3. Affect Scale

1. Instructions
2. Sample
3. Data Summary

INSTRUCTIONS:

Affective relationships experimental scale.

1. Please rate each individual in this group as to your own feeling towards that person, like or dislike, whichever it may be On the scale +5 corresponds to strong positive feeling or liking; -5 to strong negative feeling, or dislike. The zero point may be used to indicate that you have no feelings one way or another towards the person in question.

2. Please rate yourself, when you come to your own name, at the point on the scale where you would best like the group as a whole to put you. This of course may or may not be the same point at which you really expect the group to rate you.

3. Please write in your code number, section and instructor's name NOW if you have not already done so, in the space provided.

	DID YOU FEEL YOU WERE A PART OF THIS GROUP? (0 no — 5 very much)	GROUP'S IDEA OF YOU. Where group will put you on this scale. (-5 0 +5)	GROUP AS WHOLE (-5 0 +5)
OUR NUMBER ——— SECTION ——— INSTRUCTOR ———			
Russell Alexander (0 +5)	Bill Graves (-5 0 +5)	William MacMillan (-5 0 +5)	William Pavelich (-5 0 +5)
Jim Abermath (0 +5)	Tom Harkness (-5 0 +5)	John Macrides (-5 0 +5)	Don Redfern (-5 0 +5)
Joanne Auch (0 +5)	John Hathaway (-5 0 +5)	Ann Mainland (-5 0 +5)	Alvin Rottman (-5 0 +5)
Marianne Averill (0 +5)	George Hoss (-5 0 +5)	Matt Mann (-5 0 +5)	Sammy Rubley (-5 0 +5)
David Bailey (0 +5)	Mary Horafakis (-5 0 +5)	Ted Maycroft (-5 0 +5)	Paul Schaible (-5 0 +5)
Margaret Bevan (0 +5)	Burton Kelly (-5 0 +5)	Art Mevins (-5 0 +5)	George Serbinoff (-5 0 +5)
Doug Covert (0 +5)	R.D. Kingsbury (-5 0 +5)	Nancy Nothagel (-5 0 +5)	Constance Skaff (-5 0 +5)
Jim Eatman (0 +5)	David Leddick (-5 0 +5)	Ruth Oestreicher (-5 0 +5)	Carole Somer (-5 0 +5)
Gerald Flury (0 +5)	Melvin Lederman (-5 0 +5)	William O'Hern (-5 0 +5)	Ralph Stratton (-5 0 +5)
Robert Graham (0 +5)	Ileana Lindh (-5 0 +5)	Ralph Olivanti (-5 0 +5)	Lawrence Stratton (-5 0 +5)
		Charles Vaughan (-5 0 +5)	Robert Wylie (-5 0 +5)

Data Summary, Affect Scale: Teacher B,
Teacher-centered Section
(All ratings are positive)

	individual percept of group				group percept of individual	
Ident. No.	M	SD	Self Rating	Group as Whole	M	SD
1	.76	1.80	2	3	.94	1.84
2	.00	1.10	1	1	.62	1.01
3	.92	1.20	2	2	.53	.90
4	.72	1.25	1	0	.20	1.05
5	1.60	1.67	2	3	1.25	1.70
6*	2.95	.78	3	4	2.56	1.30
7	1.20	1.91	2	3	.60	.95
8	1.80	1.06	2	3	1.08	1.14
9	.44	1.39	2	1	1.47	1.41
10	.16	.36	1	1	1.24	1.79
11*	1.92	1.54	4	2	.46	.72
12*	.19	1.60	1	2	1.21	1.37
13*	1.15	1.20	3	3	2.06	1.54
14*	.56	1.70	0	1	.24	2.58
15*	1.72	1.37	3	4	1.88	1.27
16	.20	1.20	2	1	1.36	1.72
17	1.05	1.20	1	1	1.19	1.70
18	.58	.86	-	2	1.37	1.22

*Girl

Data Summary, Affect Scale: Teacher A,
Group-centered Section
(all ratings are positive)

Ident. No.	individual percept of group M	SD	Self Rating	Group as Whole	group percept of individual M	SD
19*	1.83	1.82	3	-	1.05	1.81
20	1.80	1.41	2	-	2.86	1.65
21	1.40	.85	2	3	2.29	1.96
22	.92	2.14	2	-	3.23	1.38
23*	2.88	3.32	5	5	3.05	1.49
24*	2.23	2.04	5	-	2.95	2.05
25	2.04	2.55	5	-	1.71	2.00
26	1.71	1.74	1	4	1.29	1.66
27	3.04	1.22	2	2	1.84	1.76
28	2.29	1.83	3	-	1.28	1.76
29	2.13	2.33	5	5	2.86	1.80
30	2.21	1.79	0	-	.67	1.29
31	1.44	1.20	1	-	2.40	1.43
32	3.08	2.00	3	3	3.36	1.64
33*	3.50	2.53	5	5	.52	1.33
34	1.91	1.32	3	3	2.74	1.62
35	1.08	1.79	1	3	1.84	2.46
36	1.35	.96	2	3	1.74	1.74
37	1.08	1.32	3	-	1.94	2.54
38	1.60	.92	1	-	2.18	1.50
39	1.88	1.88	2	3	2.62	1.55
40*	2.76	1.73	5	5	2.05	1.57
41*	1.68	2.66	4	3	1.58	1.21

*Girl

Data Summary, Affect Scale: Teacher A,
Teacher-centered Section
(all ratings are positive)

Ident. No.	individual percept of group M	individual percept of group SD	Self Rating	Group as Whole	group percept of individual M	group percept of individual SD
42	.80	2.77	4	0	1.11	1.63
43	1.84	1.71	2	3	1.90	1.69
44	1.56	2.09	5	5	2.20	1.78
45	.72	1.22	2	0	.95	1.74
46	.60	1.85	3	2	.47	1.02
47	.38	.95	1	1	1.00	1.55
48	2.44	1.50	4	-	.77	2.46
49	1.12	1.91	4	2	.55	1.12
50	.96	1.71	2	2	1.76	1.90
51	2.10	1.07	3	3	1.90	1.84
52	.75	.72	2	2	1.57	2.22
53	.32	1.19	0	0	.62	.99
54*	1.74	.60	5	-	1.95	1.56
55	1.21	2.70	2	2	1.60	1.77
56*	3.20	1.76	5	5	2.62	1.68
57	2.16	1.81	3	5	.60	1.13
58	1.20	1.30	4	3	1.24	2.86
59	1.20	1.20	4	2	.90	1.74
60	.88	1.68	4	0	.90	1.46
61	.32	.73	2	0	.95	1.67
62	3.20	1.47	2	4	.95	1.40
63	1.44	2.35	5	0	.55	1.36
64					2.19	2.12

*Girl

Data Summary, Affect Scale: Teacher B,
Group-centered Section
(all ratings are positive)

Ident. No.	individual percept of group		Self Rating	Group as Whole	group percept of individual	
	M	SD			M	SD
65	.80	1.55	2	2	1.06	1.61
66	2.04	1.86	3	5	1.94	1.28
67	.84	1.97	3	3	1.53	1.46
68*	1.88	1.07	2	4	2.47	1.24
69	1.40	1.62	3	3	1.12	1.62
70	2.08	1.16	2	4	.53	.92
71	2.80	1.41	3	3	1.47	1.58
72*	.68	1.43	2	1	1.53	1.58
73	1.32	1.76	2	4	.59	1.19
74*	1.68	1.67	4	5	1.65	2.06
75*	2.24	1.92	5	4	.88	2.08
76*	.68	1.26	0	3	1.12	1.36
77	.64	.97	1	2	.29	.75
78	1.65	1.98	3	4	1.71	1.78
79	.88	.95	1	2	1.83	1.47
80	.12	.10	0	4	.65	1.13
81	2.88	1.73	3	4	2.29	2.11
82	.72	1.61	1	2	1.35	1.43

*Girl

APPENDIX C-4. Wire Recording of Reactions to Film

1. Brochure of film "The Feeling of Rejection"
2. Instructions to evaluators of discussion typescript
3. Evaluations of typescript

The Model Child

By CATHERINE MACKENZIE

SOME lessons learned too well in childhood and carried over into adult life are shown in a unique film, "The Feeling of Rejection," produced by the National Film Board of Canada for the Mental Health Division of the Department of National Health and Welfare. Based on an actual case history it tells the story of Margaret, aged 23, whose recurrent headaches and constant weariness cannot be traced to any physical cause. Outwardly quiet and competent, she cannot stand up for herself in the most ordinary situations at home or in her job. She cannot protest. She is not happy in agreeing. Referred to a psychiatrist she gradually discovers what has made her feel and act as she does. Here are a few childhood episodes from the twenty-three-minute 16 mm. sound film.

THE NEW YORK TIMES. NOVEMBER 2, 1947.

Margaret learned early that to assert herself was to risk loss of love and approval. Memories of childhood reveal that independent action, and a normal need to learn at first hand were discouraged. Here she is put in a corner with toys. Her father says, "Be a good girl."

A little sister. She competes for attention she must have. When she cannot get it she feels she is not wanted. "Look, Mummy and Daddy, I can dance." "Mummy and Daddy don't love little girls that show off." To show off is bad. If you are bad no one will love you.

Trying other ways—creative ways—to get attention and affection, she picks the wrong moments. "Margaret, take your dirty paints away. I don't want my laundry all messed up." Outlets through self-expression denied, self-confidence already shaky, she gives up easily.

A well-meaning but over-anxious mother often discourages her by exaggerating everyday hazards. "Margaret, little girls don't climb on gates. You'll hurt yourself and get all dirty. Mummy wants you to be a good little girl and keep neat and tidy. Love Mummy?"

As a child she repeatedly hears, "Don't," "You mustn't," "Margaret, stop that. You'll hurt yourself, child. Mummy doesn't want her darling baby to be hurt." Normal activity discouraged, normal rebuffs ("No, no, go and play") loom larger to the child than they should.

Now she depends too much on her parents' approval, avoids play with other children and clings to mother at a party. Even devoted parents may discourage the self-confidence a child needs to face and stand up to later difficulties. These parents aren't unusual.

Age 8, washing dishes, parents nod and voice their approval: "A good girl." The model child has learned that the way to be wanted and needed is never to express her ideas or desires, always to accept other people's choices. The safe thing is to do what she is told.

Twelve-year-old Margaret wants the part in the school play, but is afraid to compete for fear she will lose friendship. Emotional ties of childhood are broken only when she gets help to understand them. In a group she comes to feel that she belongs, to grow up.

2. Instructions to evaluators of typescript.

Your cooperation in this research project will be appreciated. You are asked as an expert clinician and therapist to evaluate each of two class discussions, following showing of the film, "Feeling of Rejection," with regard to the nature of the clinical insight shown by the students. The problem presented to them for discussion was "what made the girl in this film the way she was." PLEASE READ THE ACCOMPANYING BROCHURE AND SYNOPSIS OF THE FILM FIRST. Your reading and evaluation should not require more than 30 minutes. Please record your evaluation below. Check here if you have seen this film _____.

FIRST RECORDING.

SECOND RECORDING.

3. Evaluation of typescripts.

Evaluation with regard to nature of clinical insight shown of two transcripts of wire recording of 15-minute class discussions following presentation of film, "Feeling of Rejection," in teacher A's group and non-group sections during 14th week of semester. The problem presented to the classes for discussion was "what made the girl in this film the way she was." The evaluation of the transcripts was made by two clinicians at the University of Michigan, neither of whom was familiar with the present experiment or the nature of the groups beyond the fact that they were classes. The evaluators, neither of whom had seen the film, were requested to read an explanatory brochure and a synopsis (see p. 62) of the film before making their judgment on the discussion. Note that the recording sheet used permits relatively free and unstructured comments. Evaluations made in March, 1949.

Evaluation by Dr. Max L. Hutt, Associate Professor of Psychology and Psychologist in the Neuropsychiatric Institute.

(introductory remarks by Dr. Hutt on his report) It is a bit like guessing in the dark to attempt to evaluate the nature of clinical insight with regard to this picture, if one doesn't know the picture thoroughly. However, some things do appear quite clear to me:

FIRST RECORDING (Ed. note: G/C section) This group is sensitive to the expression of feelings, types of mechanisms used to deal with conflicts and the varied and interrelated aspects of behavior of the "heroine." The group senses much of the problems of an oedipal nature and the sibling and social difficulties and has a glimmering of the significance of repression and denial.

Most of all, I'd like to comment on the marked degree of inter-action and spontaneity of the group.

SECOND RECORDING (Ed. note: T/C section) 64 (see Appendix C-3) produces strong, negative counter-transference in me! He dominates the group, stifles spontaneity, leads them to intellectualizing and label-pinning.

The group is insecure, aggressive, and formalistic.

Little insight is shown by (most) members into the underlying dynamics. Major concern is with descriptive symptom elucidation and nosological considerations. As a group, this group shows far less understanding of the "heroine's" difficulties.

(signed) M. L. Hutt

Evaluation by Dr. Daniel R. Miller, Assistant Professor of Psychology and Chief, Clinical Services Division, Bureau of Psychological Services.

FIRST RECORDING (Ed. note: G/C section)

Better insight.

Discussed real issue, not abstract words like "psychoneurotic"

No one dominated the discussion or prompted others

This group seemed to be less frightened by the issues of the film and could take it more seriously and less defensively than the other

More questions were asked. An attempt was made to answer each by the group as a group

I'd suspect the second group were psychology students, not the first. If this is true, it corroborates my hypothesis that training in psychological theory handicaps insightful thinking about people if it occurs without personal therapy or in a context of detailed case histories.

SECOND RECORDING (Ed. note: T/C section)

64 was very dominant and assigned the problem

" seemed to need to isolate his feelings, especially fear

64 set the problem off on an abstract verbal and meaningless talk

64 seemed to need to avoid insight in the problem (his? He <u>says</u> <u>so</u> <u>once</u>) of the picture. His fear was displaced to the microphone

The group could never get away from labelling with "black" names and thus was not enabled to cope with issues. 64 always turned the topic back to name-calling when others like 54 began to discuss issues. Thus he did not interfere when the subject changed to self-control which was safe for him. He was ably abetted by 51's topic manipulation.

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