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Jigsaw Groups and the Desegregated Classroom: In Pursuit of Common Goals

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Abstract. The desegregated classroom has not produced many of the positive results initially expected by social scientists some 25 years ago. It is argued that one of the major reasons for this failure is the over-emphasis on competitiveness at the expense of interdependence in the classroom. In short, students in most classrooms very rarely cooperate with each other in pursuit of common goals. In this article, we describe a program of research in which elementary school students are "forced" to spend part of their classroom time mastering material in an interdependent structure. The results indicate that such structured interdependence increases the self-esteem, the morale, the interpersonal attraction, and the empathy of students across ethnic and racial divisions, and also improves the academic performance of minority students without hampering the performance of the ethnic majority.

There were high hopes when the Supreme Court outlawed school segregation a quarter of a century ago. If black and white children could share classrooms and become friends, it was thought that perhaps they could develop relatively free of racial prejudice and some of the problems which accompany prejudice. The case that brought about the court's landmark decision was that of *Oliver Brown vs. the Board of Education of Topeka, Kansas*; the decision reversed the 1896 ruling (*Plessy vs. Ferguson*) which held that it was permissible to segregate racially, as long as equal facilities were provided for both races. In the *Brown* case, the court held that psychologically there could be no such thing as "separate but equal." The mere fact of separation implied to the minority group in question that its members were inferior to those of the majority.

The *Brown* decision was not only a humane interpretation of the Constitution, it was also the beginning of a profound and exciting social experiment. As Stephan (1978) has recently pointed out, the testimony of social psychologists in the *Brown* case, as well as in previous similar cases in state supreme courts, suggested strongly that desegregation would not only reduce prejudice but also increase the self-esteem of minority groups and improve their academic performance. Of course the social psychologists who testified never meant to imply that such benefits would accrue automatically. Certain preconditions must be met. These preconditions were most articulately stated by Gordon Allport in his classic, *The Nature of Prejudice*, published the same year as the Supreme Court decision:

Prejudice . . . may be reduced by equal status contact between majority and minority groups in the pursuit of common goals. The effect is greatly enhanced if this contact is sanctioned by institutional supports (i.e., by law, custom or local atmosphere), and provided it is of a sort that leads to the perception of common interests and common humanity between members of the two groups. (Allport, 1954, p.281)

The Effects of Desegregation

A quarter of a century after desegregation was begun, an assessment of its effectiveness is not encouraging. One of the most careful

and thoroughgoing longitudinal studies of desegregation was the Riverside project conducted by Harold Gerard and Norman Miller (1975). They found that long after the schools were desegregated, black, white and Mexican-American children tended not to integrate but to hang together in their own ethnic clusters. Moreover, anxiety increased and remained high long after desegregation occurred. These trends are echoed in several other studies. Indeed, the most careful, scholarly reviews of the research show few, if any, benefits (see St. John, 1975; Stephan, 1978). For example, according to Stephan's review, there is no single study that shows a significant increase in the self-esteem of minority children following desegregation; in fact, in fully 25% of the studies desegregation is followed by a significant decrease in the self-esteem by young minority children. Moreover, Stephan reports that desegregation reduced the prejudice of whites toward blacks in only 13% of the school systems studied. The prejudice of blacks toward whites increased in about as many cases as it decreased. Similarly, studies of the effects of desegregation on the academic performance of minority children present a mixed and highly variable picture.

What went wrong? Let us return to Allport's prediction. Equal status contact in pursuit of common goals, sanctioned by authority will produce beneficial effects. We will look at each of these three factors separately.

1. Sanction by authority. In some school districts there was clear acceptance and enforcement of the ruling by responsible authority. In others the acceptance was not as clear. In still others (especially in the early years) local authorities were in open defiance of the law. Pettigrew (1961) has shown that desegregation proceeded more smoothly and with less violence in those localities where local authorities sanctioned integration. But such variables as self-esteem and the reduction of prejudice do not necessarily change for the better even where authority clearly sanctions desegregation. While sanction by authority may be necessary, it is clearly not a sufficient condition.

2. Equal status contact. The definition of equal status is a trifle slippery. In the case of school desegregation, we could claim that there is equal status on the grounds that all children in the fifth grade (for example) have the same "occupational" status, i.e., they are all fifth grade students. On the other hand, if the teacher is prejudiced against blacks, she/he may treat them less fairly than she/he treats whites, thus lowering their perceived status in the classroom. (See Gerard and Miller, 1975.) Moreover, if, because of an inferior education (prior to desegregation) or because of language difficulties, black or Mexican-American students perform poorly in the classroom, this could also lower their status among their peers. An interesting complication was introduced by Elizabeth Cohen (1972). While Allport (1954) predicted that positive interactions will result if cooperative equal status is achieved, expectation theory, as developed by Cohen, holds that even in such an environment biased expectations by both whites and blacks may lead to sustained white dominance. Cohen reasoned that both of these groups accept the premise that the majority group's competence results in dominance and superior achievement. She suggested that alternatives be created to reverse these often unconscious expectations. According to Cohen, at least a temporary exchange of majority and minority roles is therefore required as a prelude to equal status. In one study, for example (Cohen and Roper, 1972), black children were instructed in building radios and in how to teach this skill to others. Then a group of white children and the newly trained black children viewed a film of themselves building the radios. This was followed by some of the black children teaching the whites how to construct radios while others

taught a black administrator. Then all the children came together in small groups. Equal status interactions were found in the groups where black children had taught whites how to construct the radios. The other group, however, demonstrated the usual white dominance. We will return to this point in a moment.

3. In pursuit of common goals. In the typical American classroom, children are almost never engaged in the pursuit of common goals. During the past several years, we and our colleagues have systematically observed scores of elementary school classrooms, and have found that, in the vast majority of these cases, the process of education is highly competitive. Children vie with one another for good grades, the respect of the teacher, etc. . . This occurs not only during the quizzes and exams but in the informal give and take of the classroom where, typically, children learn to raise their hands (often frantically) in response to questions from the teacher, groan when someone else is called upon, revel in the failure of their classmates, etc. This pervasive competitive atmosphere unwittingly leads the children to view one another as foes to be heckled and vanquished. In a newly desegregated school, all other things being equal, this atmosphere could exacerbate whatever prejudice existed prior to desegregation.

A dramatic example of dysfunctional competition was demonstrated by Sherif, et al. (1961) in their classic "Robber's Cave" experiment. In this field experiment, the investigators encouraged intergroup competition between two teams of boys at a summer camp; this created fertile ground for anger and hostility even in previously benign, non-competitive circumstances - like watching a movie. Positive relations between the groups were ultimately achieved only after both groups were required to work cooperatively to solve a common problem.

It is our contention that the competitive process interacts with "equal status contact." That is to say, whatever differences in ability existed between minority children and white children prior to desegregation are emphasized by the competitive structure of the learning environment, and since segregated school facilities are rarely equal, minority children frequently enter the newly desegregated school at a distinct disadvantage which is made more salient by the competitive atmosphere.

It was this reasoning that led Aronson and his colleagues (1975, 1978) to develop the hypothesis that interdependent learning environments would establish the conditions necessary for the increase in self-esteem and performance and the decrease in prejudice that were expected to occur as a function of desegregation. Toward this end they developed a highly structured method of interdependent learning and systematically tested its effects in a number of elementary school classrooms. The aim of this research program was not merely to compare the effects of cooperation and competition in a classroom setting. This has been ably demonstrated by other investigators dating as early as Deutsch's (1949) experiment. Rather, the intent was to devise a cooperative classroom structure which could be utilized easily by classroom teachers on a long term sustained basis and to evaluate the effects of this intervention via a well controlled series of field experiments. In short, this project is an action research program aimed at developing and evaluating a classroom atmosphere which can be sustained by the classroom teachers long after the researchers have packed up their questionnaires and returned to the more cozy environment of the social psychological laboratory.

The method is described in detail elsewhere (Aronson, et al., 1978). Briefly, students are placed in six-person learning groups. The day's

lesson is divided into six paragraphs such that each student has one and only one segment of the written material.² Each student has a unique and vital part of the information which, like the pieces of a jigsaw puzzle, must be put together for any of the students to learn the whole picture. The individual must learn his/her own section and teach it to the other members of the group. The reader will note that in this method each child spends part of her time in the role of expert. Thus, the method incorporates Cohen's findings (previously discussed) within the context of an equal status contact situation.

Working with this "jigsaw" technique, children gradually learn that the old competitive behaviors are no longer appropriate. Rather, in order to learn all of the material (and thus perform well on a quiz), each child must begin to listen to the others, ask appropriate questions, etc. . . . The process opens the possibility for children to pay attention to one another and begin to appreciate one another as potentially valuable resources. It is important to emphasize that the motivation of the students is not necessarily altruistic; rather, it is primarily self-interest which, in this case, happens also to produce outcomes which are beneficial to others.

Experiments in the Classroom

Systematic research in the classroom has produced consistently positive results. The first experiment to investigate the effects of the jigsaw technique was conducted by Blaney, Stephan, Rosenfield, Aronson and Sikes (1977). The schools in Austin, Texas, had recently been desegregated, producing a great deal of tension and even some interracial skirmishes throughout the school system. In this tense atmosphere, the jigsaw technique was introduced in ten fifth grade classrooms in seven elementary schools. Three classes from among the same schools were also used as controls. The control classes were taught by teachers who, while using traditional techniques, were rated very highly by their peers. The experimental classes met in jigsaw groups for about 45 minutes a day, three days a week for six weeks. The curriculum was basically the same for the experimental and control classes. Students in the jigsaw groups showed significant increases in their liking for their groupmates both within and across ethnic boundaries. Moreover, children in jigsaw groups showed a significantly greater increase in self-esteem than children in the control classrooms. This was true for Anglo children as well as ethnic minorities. Anglos and blacks showed greater liking for schools in the jigsaw classrooms than in traditional classrooms. (The Mexican-American students showed a tendency to like school less in the jigsaw classes; this will be discussed in a moment.)

These results were essentially replicated in a Ph.D. dissertation by Geffner (1978) in Watsonville, California - a community consisting of approximately 50% Anglos and 50% Mexican-Americans. As a control for the possibility of a Hawthorne effect, Geffner compared the behavior of children in classrooms using the jigsaw and other cooperative learning techniques with that of children in highly innovative (but not interdependent) classroom environments as well as with traditional classrooms. Geffner found consistent and significant gains within classrooms using jigsaw and other cooperative learning techniques. Specifically, children in these classes showed increases in self-esteem as well as increases in liking for school. Negative ethnic stereotypes were also diminished. I.e., children increased their positive general attitudes toward their own ethnic group as well as toward members of other ethnic groups - to a far greater extent than children in traditional and innovative classrooms.

Changes in academic performance were assessed in an experiment by Luckner, Rosenfield, Sikes and Aronson (1977). The subjects were 303 fifth and sixth grade students from five elementary schools in Austin, Texas. Six classrooms were taught in the jigsaw manner, while five classrooms were taught traditionally by highly competent teachers. For two weeks children were taught a unit on colonial America taken from a fifth grade textbook. All children were then given the same standardized test. The results showed that Anglo students performed just as well in jigsaw classes as they did in traditional classes (\bar{x} = 66.6 and 67.3 respectively);³ minority children performed significantly better in jigsaw classes than in traditional classes (\bar{x} = 56.6 and 49.7 respectively). The difference for minority students was highly significant. Only two weeks of jigsaw activity succeeded in narrowing the performance gap between Anglos and minorities from more than 17 percentage points to about 10 percentage points. Interestingly enough, the jigsaw method apparently does not work a special hardship on high ability students: students in the highest quartile in reading ability benefited just as much as students in the lowest quartile.

Underlying Mechanisms

Increased Participation. We have seen that learning in a small interdependent group leads to greater interpersonal attraction, self-esteem, liking for school, more positive inter-ethnic and intra-ethnic perceptions and, for ethnic minorities, an improvement in academic performance. We think that some of our findings are due to more active involvement in the learning process under conditions of reduced anxiety. In jigsaw, children are required to participate. This increase in participation should enhance interest, which would result in an improvement in performance as well as an increased liking for school - all other things being equal. But all other things are sometimes not equal. For example, in the study by Blaney, et al. (1977) there was some indication from our observation of the groups that many of the Mexican-American children were experiencing some anxiety as a result of being required to participate more actively. This seemed to be due to the fact that these children had difficulty with the English language which produced some embarrassment in working with a group dominated by Anglos. In a traditional classroom, it is relatively easy to "become invisible" by remaining quiet, refusing to volunteer, etc. . . Not so in jigsaw. This observation was confirmed by the data on liking for school. Blaney, et al. found that Anglos and blacks in the jigsaw classrooms liked school better than those in the traditional classrooms, while for Mexican-Americans the reverse was true. This anxiety could be reduced if Mexican-American children were in a situation where it was not embarrassing to be more articulate in Spanish than in English. Thus, Geffner (1978), working in a situation where both the residential and school population was approximately 50% Spanish-speaking, found that Mexican-American children (like Anglos and blacks) increased their liking for school to a greater extent in the cooperative groups than in traditional classrooms.

Increases in Empathic Role-taking. Only a small subset of our results is attributable to increases in active participation in and of itself. We believe that people working together in an interdependent fashion increase their ability to take one another's perspective. For example, suppose that Jane and Carlos are in a jigsaw group. Carlos is reporting and Jane is having difficulty following him. She doesn't quite understand because his style of presentation is different from what she is accustomed

to. Not only must she pay close attention, but in addition, she must find a way to ask questions which Carlos will understand and which will elicit the additional information that she needs. In order to accomplish this, she must get to know Carlos, put herself in his shoes, empathize.

Bridgeman (1977) tested this notion. She reasoned that taking one another's perspective is required and practiced in jigsaw learning. Accordingly, the more experience students have with the jigsaw process, the greater will their role-taking abilities become. In her experiment, Bridgeman administered a revised version of Chandler's (1973) role-taking cartoon series to 120 fifth grade students. Roughly half of the students spent eight weeks in a jigsaw learning environment while the others were taught in either traditional or in innovative small group classrooms. Each of the cartoons in the Chandler test depicts a central character caught up in a chain of psychological cause and effect, such that the character's subsequent behavior was shaped by and fully comprehensible only in terms of the events preceding them. In one of the sequences, for example, a boy who had been saddened by seeing his father off at the airport began to cry when he later received a gift of a toy airplane similar to the one which had carried his father away. Midway into each sequence, a second character is introduced in the role of a late-arriving bystander who witnessed the resultant behaviors of the principal character, but was not privy to the causal events. Thus, the subject is in a privileged position relative to the story character whose role the subject is later asked to assume. The cartoon series measures the degree to which the subject is able to set aside facts known only to him or herself and adopt a perspective measurably different from his or her own. For example, while the subject knows why the child in the above sequence cries when he receives the toy airplane, the mailman who delivered the toy is not privy to this knowledge. What happens when the subject is asked to take the mailman's perspective?

After eight weeks, students in the jigsaw classrooms were better able to put themselves in the bystander's place than students in the control classrooms. For example, when the mailman delivered the toy airplane to the little boy, students in the control classrooms tended to assume that the mailman knew the boy would cry; that is, they behaved as if they believed that the mailman knew that the boy's father had recently left town on an airplane - simply because they (the subjects) had this information. On the other hand, students who had participated in a jigsaw group were much more successful at taking the mailman's role - realizing that the mailman could not possibly understand why the boy would cry upon receiving a toy airplane.

Attributions for Success and Failure. Working together in the pursuit of common goals changes the "observer's" attributional patterns. There is some evidence to support the notion that cooperation increases the tendency for individuals to make the same kind of attributions for success and failure to their partners as they do for themselves. In an experiment by Stephan, Presser, Kennedy and Aronson (1978) it was found (as it has been in several experiments by others) that when an individual succeeds at a task he tends to attribute his success dispositionally (e.g., skill) but when he fails he tends to make a situational attribution (e.g., luck). Stephan, et al. went on to demonstrate that individuals engaged in an interdependent task make the same kinds of attributions to their partner's performance as they do for their own. This was not the case in competitive interactions.

Effects of Dependent Variables on One Another. It is reasonable to assume that the various consequences of interdependent learning become antecedents for one another. Just as low self-esteem can work to inhibit a child from performing well, anything that increases self-esteem is likely to produce an increase in performance among those underachievers. Conversely, as Franks and Marolla (1976) have indicated, increases in performance should bring about increases in self-esteem. Similarly, being treated with increased attention and respect by one's peers (as almost inevitably happens in jigsaw groups) is another important antecedent of self-esteem according to Franks and Marolla. There is ample evidence for a two-way causal connection between performance and self-esteem (see Covington and Beery, 1976; Purkey, 1970).

Other Cooperative Techniques

In recent years a few research teams utilizing rather different techniques for structuring cooperative behavior have produced an array of data consistent with those resulting from the jigsaw technique. For example, Stuart Cook and his colleagues at the University of Colorado (1978) have shown that interracial cooperative groups in the laboratory underwent a significant improvement in attitudes about people of other races. In subsequent field experiments, Cook and his colleagues found that interdependent groups produced more improved attitudes to members of previously disliked racial groups than was present in non-interdependent groups. It should be noted, however, that no evidence for generalization was found; i.e., the positive change was limited to the specific members of the interdependent group and did not extend to the racial group as a whole.

Working out of the University of Minnesota, Johnson and Johnson (1975) have developed the "Learning Together" model which is a general and varied approach to interdependent classroom learning. Basically, Johnson and Johnson have found evidence for greater cross-ethnic friendship ratings, self-esteem and higher motivation in their cooperative groups than in control conditions. They have not found an increase in academic performance, however.

In a different vein, Slavin (1978), DeVries (1978) and their colleagues at Johns Hopkins University have developed two highly structured techniques that combine within-group cooperation with across-group competition. These techniques, "Teams Games and Tournaments" (TGT) and "Student Teams Achievement Divisions" (STAD) have consistently produced beneficial results in lower class, multi-racial classrooms. Basically, in TGT and STAD, children form heterogeneous five-person teams; each member of a team is given a reasonably good opportunity to do well by dint of the fact that she competes against a member of a different team with similar skills to her own. Her individual performance contributes to her team's score. The results are in the same ball park as jigsaw: children participating in TGT and STAD groups show a greater increase in sociometric, cross-racial friendship choices and more observed cross-racial interactions than control conditions. They also show more satisfaction with school than the controls do. Similarly, TGT and STAD produces greater learning effectiveness among racial minorities than the control groups.

It is interesting to note that the basic results of TGT and STAD are similar to those of the jigsaw technique in spite of one major difference in procedure: while the jigsaw technique makes an overt attempt to minimize competition, TGT and STAD actually promote competitiveness

and utilize it across teams - within the context of intrateam cooperation. We believe that this difference is more apparent than real. In most classrooms where jigsaw has been utilized the students are in jigsaw groups for less than two hours per day. The rest of the class time is spent in a myriad of process activities, many of which are competitive in nature. Thus, what seems important in both techniques is that some specific time is structured around cooperativeness. Whether the beneficial results are produced in spite of a surrounding atmosphere of competitiveness or because of it - is the task of future research to determine.

Conclusions

We are not suggesting that jigsaw learning or any other cooperative method constitutes the solution to our interethnic problems. What we have shown is that beneficial effects occur as a result of structuring the social psychological aspects of classroom learning so that children spend at least a portion of their time in pursuit of common goals. These effects are in accordance with predictions made by social scientists in their testimony favoring desegregating schools some 25 years ago. It is important to emphasize the fact that the jigsaw method has proved effective even if it is employed for as little as 20% of a child's time in the classroom. Moreover, other techniques have produced beneficial results even when interdependent learning was purposely accompanied by competitive activities. Thus, the data do not indicate the placing of a serious limit on classroom competition, or interfering with individually guided education. Interdependent learning can and does coexist easily with almost any other method used by teachers in the classroom.

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Footnotes

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² The method works best with discrete, continuous written material (like Social Studies) but it has been successfully utilized with mathematics and language arts as well.

³ The mean scores have been converted to percentage of correct answers.