

Basic Jigsaw 1

Classroom Competition and Cultural Diversity

American education has been in a state of crisis for almost as long as we can remember. This has been particularly true during the past four decades, when dramatic changes in our society as a whole have are reflected in our public schools, turning them into veritable pressure cookers. Added demands are being placed on teachers who struggle to open minds and guide the development of skills in increasingly crowded and impoverished surroundings. Declining test scores have had many explanations: Teachers view many children as unprepared for learning when they first arrive at school. Parents point the finger at the schools as incompetent to educate their children. Politicians put the blame on "frills" and periodically demand that schools go back to basics. Everyone blames society for lowered standards of behavior. But finger pointing and blaming are not the best way to solve problems.

What is clear is that our society is moving toward increased diversity and children come to the classroom with as almost as many different experiences and expectations as there are children. They have different personalities, different skills, different abilities, different cultural backgrounds, different levels of self-esteem and different emotional needs. All of these must be accommodated--at least to some extent--in order for a child to learn efficiently. Most teachers are well aware that classroom learning is not an "either-or" thing: Rather, a child's emotional well-being and sense of self are certain to have a powerful impact on his or her acquisition of traditional knowledge and basic skills in the classroom. Indeed, research has shown that, under conducive conditions, emotional and

intellectual growth go hand in hand; sensible techniques aimed at increasing a child's emotional well-being also have a positive impact on learning the basics.

What are "conducive" conditions--and how can they be implemented? On the following pages we will describe one classroom technique that, over the past 25 years has succeeded in establishing a classroom atmosphere that produces exciting changes in the performance, the morale, and the well-being of children. The technique is a very simple one; hundreds of teachers and thousands of students have mastered it quickly and enjoy using it. In a nutshell, the technique produces a classroom structure that enables children to cooperate with one another to attain their educational objectives and, simultaneously, to develop important interpersonal skills and a sharp increase in mutual appreciation in an atmosphere that is exciting and challenging rather than threatening or anxiety-producing. As class sizes have continued to grow, teachers who have used this strategy have learned (to their delight) that they can rely, increasingly, on their students' enhanced interpersonal skills to help with classroom management. In the following chapters we will describe this technique and present some evidence for its efficacy. We will then present detailed ways of establishing it in the classroom. But first, let's take a brief look at the broader societal issues that form the background out of which this educational strategy emerged.

Competition in Society

Americans have made a religion of winning. From the fans in football stadiums chanting "We're number one" and the little leaguer who bursts into tears when his team loses to business leaders and economic pundits who worry about trade

with Japan and the value of the dollar, our society asserts its allegiance to victory and its contempt for losers. Our economic system is based on competition and much of American life is framed in competitive terms; newspapers regularly publish rankings of everything from sports teams to movie box office receipts; magazines publish articles about the 50 most beautiful people, the 10 best restaurants, or the 25 Americans with the highest incomes. One of the worst things you can say about your neighbor is that he or she is "a loser"!

What are the consequences of this attitude? How do people behave when competition is a way of life? We experience a great deal of anxiety when our performance is being observed or measured; we come to view one another as competitors and potential enemies; we are forever looking over our shoulder lest someone overtake us. We may experience pangs of envy when an acquaintance lands a good job or becomes a successful doctor, lawyer, or barber and we come to look down on those who don't succeed. Once on this treadmill there is no respite, no resting place. For many people in our society, even reaching great heights of accomplishment does not lead to peace but to still greater anxiety lest they fall from grace. And this anxiety is not unwarranted. Coaches who don't produce winning teams, salespeople who don't make quota, even scientists who don't publish first, find themselves looking for employment. In a society obsessed with winning, each of us is only as good as our most recent performance. Some may become so anxious about losing that they decide to stop competing altogether; they become listless in school or at work, simply trying to get through the day--or they might drop out altogether.

This is not to suggest that competition is evil, or even that it is always dysfunctional. Under many circumstances competition can be fun. It can add

zest to an otherwise dull assignment. Moreover there are situations where adding a dash of competition can enhance performance. But, over and over again, we have found that unbridled competition--the relentless concern with being number one, with beating the other person can be, at best, limiting and, at worst, destructive and debilitating.

Competition in the Classroom

Intense competitiveness is not inborn, but, in our society, it often seems to be because it is learned so early and is so pervasive. Undoubtedly, for most of us, it is communicated and fostered by the family and the media. But one of the major places where it has been taught, indirectly but systematically, is the classroom. Before looking at the competitive aspect of classroom education, it might be useful for our adult readers to try to remember what it was like to be a youngster in elementary school. Some may recall their elementary school days with feelings of pleasant nostalgia, others with dread and anxiety. Either way, it is almost invariably the bond (or lack thereof) with the teacher that stands at the center of the memory. Recent innovations such as team teaching, computers in the classroom, and the extensive use of outside resources have added new dimensions to the atmosphere of many modern classrooms. But whether primarily traditional or primarily innovative, virtually all classrooms share two common aspects: the major "process" that occurs is highly competitive, and the ultimate goal of the competition among students is to win the approval and respect of the teachers--to show these important people that we are worthy of their or his respect--and perhaps even their love.

What do we mean by "process"? Whenever two or more people interact, two events occur simultaneously. One of these is the content and the other is the process. Content refers to the substance or subject matter of the encounter; process refers to the dynamics of the encounter, how it occurs. For example, in a classroom the content could be arithmetic, geography, social studies, or music; the process is the manner in which these lessons are taught. It is through the process that people learn a great deal about the world they live in. Indeed, it might even be argued that in the elementary school classroom the process is a broader and more important source of learning than the content itself.

The teaching process as it relates to competition is well known. Here is a common scene: the teacher stands in front of the classroom and asks a question which the children are expected to answer. A few children strain in their seats and wave their hands in the teacher's face, seemingly eager to be called upon. Several other students sit quietly with their eyes averted as if trying to make themselves invisible. When the teacher calls on one of the students you can see looks of disappointment, dismay, and unhappiness on the faces of the eager students. If the student who is called upon comes up with the right answer, the teacher smiles, nods her head, and goes on to the next question. That smile and nod is a great reward. Among the other eager students, however, the success of the fortunate student causes disappointment because now they will have no opportunity to show the teacher how smart and quick they are - until the next question. Others remain still, hiding.

Through this process, students learn several things. First they learn that there is one and only one expert in the classroom: the teacher. They also learn that there is one and only one correct answer to any question she may ask: the answer the

teacher has in her head. The task is to figure out what answer the teacher expects. The students also learn that the payoff comes from pleasing the teacher by showing her how quick, smart, neat, clean, and well behaved they are. If the child does this successfully, she will gain the respect and love of this powerful person. This powerful person may then be kind to the child and tell her parents what a wonderful person the child is. Other children may opt out of the academic race and satisfy their need for attention in other, less desirable ways.

This process, then, is a very competitive game. Moreover, the stakes are extremely high. In conducting workshops in all regions of the country, one of the most touching things we have discovered is that, most even--even those in their sixties and seventies--have vivid recall of the name and face of their elementary school teachers. Elementary school is a vivid place where important and memorable things happened to all of us. It is a place where the stakes are high precisely because it is important to be liked and respected by the teacher--who, naturally enough, is usually one of the two or three most important people in their world.

It is precisely because the teacher is so important, that the generally competitive atmosphere in the classroom takes on such a powerful aura. Suppose you are a fifth-grader; the teacher asks a question--and you know the correct answer. You raise your hand; but the teacher calls on one of the other students. What do you suppose is going on in your heart and mind? Are you hoping that the student recites the correct answer? Possibly. But in our research we have found that it is far more likely that you will sit there praying that he or she comes up with the wrong answer so that you will still have a chance to show the teacher how smart you are.

Furthermore, given the competitive atmosphere, it is likely that those who fail when called upon or who do not even raise their hands will resent those who succeed. They become envious, or try to denigrate a more successful student by branding him a "nerd" and might find an excuse to mock him or taunt him during recess. Or worse, they may tune out altogether. The successful students, for their part, often hold the unsuccessful students in contempt, considering them to be dumb, uninteresting, not worth knowing. The result is that, to a greater or lesser extent, the process which takes place in most elementary school classrooms is virtually guaranteed not to promote friendliness, understanding, and cooperation among the children. Quite the reverse.

Desegregation and Competition: The Origins of Jigsaw

In 1971, an exciting event took place in Austin, Texas. In accordance with the Supreme Court ruling of 1954, the public schools were desegregated. Unfortunately, as in many communities, this event did not occur without turmoil. Because Austin, at that time, was residentially segregated, the desegregation of the schools was implemented by means of a busing program. Thus, for the first time in their lives, youngsters from various ethnic and racial groups suddenly found themselves in close daily contact with one another. There was a great deal of conflict across racial lines which occasionally flared into physical violence.

As, it happened, one of us (E.A.) was living in Austin (teaching at the University of Texas) at the time. As a social psychologist, Aronson had done a great deal of research in interpersonal relations. Moreover, as a father, with four children in

the public school system, he took more than a passing interest in the turmoil in the schools. As an experienced professional in crisis management, he considered several possible intervention strategies that might help in the immediate crisis, but he was much more interested in long term prevention than in immediate alleviation of the symptoms. Let us explain.

When there is a "hot" crisis in the schools--with students engaging in inter-ethnic conflict and aggression, the obvious short-term solution is to slap on a band-aid by, for example, instituting emergency multi-ethnic human relations councils that can begin discussing issues, problems, points of tension, and so forth. While this may be adequate as crisis intervention, it would be far better for society if methods could be devised to *prevent* these tensions from developing. Moreover, it would be far more efficient and effective if these methods could be built into the structure of the institution rather than stitched on as an afterthought. Specifically, *it would be valuable if the basic process could be changed so that youngsters could learn to like and trust each other --not as an extracurricular activity but in the course of learning their reading, writing, and arithmetic.* In order to accomplish this goal, it might be useful to deal with students who had not been completely indoctrinated into the existing competitive process and had not yet developed deep-seated distrust for people of different racial and ethnic groups. For this reason, Aronson and his colleagues approached the situation as a learning problem not as a crisis-management problem--and they began their research in the elementary schools rather than in the high schools.

The Problem

Before describing the resulting research, a word about the social psychology of desegregation. In 1954 in the landmark case of *Brown vs. the Board of Education of Topeka, Kansas*, the Supreme Court declared that separate but equal schools were by nature unequal. This decision was based, in part, upon social psychological research which suggested that sending minority children to separate schools damages their self-esteem. The reasoning was that segregation implies that children from minority groups are inferior; thus there is no way that separate but equal schools can ever be equal, at least in spirit. That is to say, even if schools serving minority children were to have books and teachers and buildings of comparable quality to those serving the children of the establishment, they would still be by nature unequal because they are separate, and being separated makes minority children feel inferior.

The Supreme Court decision was not only humane, it was also the beginning of what to us, as working social psychologists, was a very exciting social experiment. In those days, most social scientists believed that, as a direct result of this ruling, prejudice would be markedly decreased because increased contact among children of various racial groups would produce greater liking and understanding. Moreover, we had reason to believe that busing as a means of increasing interracial contact would not only increase mutual understanding but would also provide minority children with a richer educational experience. Indeed the monumental Coleman Report indicated that the exam performance of black children improved as the percentage of white children in their classroom increased. But Coleman's data were based primarily on black children who were living in neighborhoods that were predominantly white. One might suspect that

these children might differ in many significant respects from children living in impoverished inner city neighborhoods.

And, sure enough, subsequent research in the California public schools by Harold Gerard and Norman Miller showed that when busing was used to integrate schools, no such improvement in the performance of African American children occurred. Moreover, several years later, when Walter Stephan reviewed scores of studies done in the aftermath of desegregation, he found no clear evidence that desegregation increased self-esteem among minority students. Rather, in 25 percent of the studies, the self-esteem of minority children actually decreased. This is ironic and tragic when viewed in the context of the reasoning behind the 1954 decision.

For us, the crucial variable is not busing--but *what happens* when children get off the bus--that is, the process that exists in the typical classroom. And, as we have indicated, it is our contention that the academic competitiveness that exists in the classroom is crucial--for it is not a process that encourages students to look benevolently and happily upon their classmates; it is not a process that is designed to increase understanding and interpersonal attraction even among people of the same racial or ethnic background. Rather, the process induces competitiveness, one-upmanship, jealousy, and suspicion. When one adds to this situation the already existing racial tensions that are present in our increasingly multi-cultural society, it is little wonder that turmoil and even violence is frequently the result.

Moreover, the situation is even more volatile than we have pictured it. In most American cities, when schools were first desegregated students were competing

with each other on unequal ground. Prior to 1954, the law of the land was "separate but equal". Unfortunately, there was plenty of separation, but very little equality. That is, schools in the neighborhoods that housed most ethnic minorities were not providing the same quality of education that was being offered in most middle-class white neighborhoods. Consequently, in Austin, for example, just prior to busing, the knowledge, reading skills, intellectual curiosity, and ability to compete in cognitive skills of most minority-group youngsters was inferior to that of their more privileged counterparts. This inequality still exists. Specifically, in most communities today there are impoverished neighborhoods from which some of the neediest and least prepared students emerge, taxing severely the resources of a school. Existing conditions can frustrate even the most gifted teacher.

Today, integration issues are even more complex. Instead of students bused from across town, teachers are now being asked to welcome into their crowded classrooms, immigrant children from dozens of nations, some of whom have had little schooling and speak no English. Other students are the children of economic refugees with a history of frequent moves and family environments that make education a low priority. The skills these children bring to school are for survival in a world very different from the one the school culture assumes. Teachers are also being asked to provide appropriate education for children with assorted learning difficulties and include into their classrooms, disabled students who were once educated in separate facilities. At the very least, these students are also likely to experience increased anxiety and low self-esteem when entering an educational environment for which they are not prepared.

Needless to say, we no longer believe that the simple act of desegregating classrooms is, in and of itself, a panacea. We are convinced that it is a necessary first step toward helping children accept and respect one another as individuals. But it is only the first step. It is clear that changes in the classroom process itself are vitally important.

Returning now to the Austin project, if our understanding of the process was correct, it was necessary to find a way to change the process - that is, to change the atmosphere in the classroom so that the children would no longer be competing against each other but would begin to treat each other as resources. Further, if our reasoning was correct, changing the process could have a beneficial effect upon the interpersonal relations of all the students, not simply minority-group members. Recall that in the process we described, there was only one human resource in the classroom: the teacher. The teacher is the source of all answers and virtually all reinforcements. In that process there is no payoff for consulting and collaborating with one's classmates. They are your enemies, your competitors; they, too, are trying to impress the teacher and get that approval and respect you want. Indeed, if a student does try to use the others as resources in the typical classroom, he may be reprimanded. Thus, not only is the process highly competitive and destructive to interpersonal relations - which is itself a heavy cost - but, in addition, a potentially valuable pool of human resources in the classroom is out of bounds.

The Cooperative Classroom¹

Our attempt to change the process was a relatively simple one employing a synthesis of principles gleaned from Aronson's years of work on small-group dynamics and social interaction. First, Aronson and his colleagues changed the basic structure of one expert (the teacher) and thirty listeners . This was accomplished by placing the students in small groups of five or six students each. The role of the teacher was changed so that he or she was no longer the major resource for each of the learning groups *by creating a process that made it imperative that the children treat each other as resources*. This was achieved in three ways:

1. The learning process was structured so that individual competitiveness was incompatible with success.
2. It was certain that success could occur only after cooperative behavior among the students in a group.
3. Each student (no matter what her prior status in the classroom) was in a position to bring to her group-mates a unique gift of knowledge (i.e., a piece of vital knowledge that was not readily available except from that student).

¹ Throughout, we use the term "cooperative classroom" or "jigsaw classroom." By this we do not mean to imply that cooperation is used exclusively in the classroom, merely that it is systematically used some of the time.

As mentioned earlier, in a traditional classroom, the students are often rewarded when they succeed in attracting the teacher's attention by outshining their competitors. In the cooperative classroom, the students achieved success as a consequence of paying attention to their peers, asking good questions, helping each other, teaching each other, and helping each other teach.

How did this come about? An example will clarify. In the initial experiment, Aronson and his colleagues entered a fifth-grade classroom where the students were studying biographies of great Americans. The upcoming lesson happened to be a biography of Joseph Pulitzer. The researchers created a biography of Joseph Pulitzer that consisted of six paragraphs. The first paragraph was about Pulitzer's ancestors and how they came to this country; the second described his childhood and growing-up years; the third covered Pulitzer as a young man, his education, and his early employment; the fourth told of his middle-age years and how he founded his newspaper; and so forth. Each major aspect of Pulitzer's life was contained in a separate paragraph.

They copied the biography, cut it into six one-paragraph sections and gave each child in the six-person learning group one of the paragraphs. Thus, each learning group had within it the entire biography of Joseph Pulitzer, but each child had no more than one-sixth of the story. In order to learn about Pulitzer, the students had to master their paragraph and teach it to the others in their group. For example, David was responsible for Pulitzer as a young man, Geoff for Pulitzer as a child, and so forth. Each student took his paragraph, read it over a few times, and then joined his counterparts from the other groups. That is, David, who had Pulitzer as a young man, consulted with Geoff, Christy, Lori, and Jon, who had also been given Pulitzer as a young man. They could use each

other to rehearse and to be sure they understood the important aspect of that phase of Pulitzer's life. In this way, each student would become an expert in his or her segment of Joseph Pulitzer's life. We call these temporary groupings "expert groups".

This part of the process is of great importance in that it provides time, space and practice for the less articulate and less skillful students to learn the material and affords them an opportunity to make use of the more adept students as models for organizing and presenting their report. The mediation of the expert group, helps to make the jigsaw experience virtually foolproof. As psychologist Roger Brown has pointed out, if it weren't for the expert groups, the jigsaw method might backfire; Brown likens the jigsaw experience to a group of youngster's playing baseball: If the boy playing right field keeps dropping fly balls, it hurts your team and you might begin to get a little annoyed at him. By analogy, suppose you are dependent on the performance of a Hispanic youngster who is less than perfectly adept in English, and he is having some difficulty articulating his segment of the lesson. You might resent him. The "expert" groups provides all students with the opportunity to get a clear idea of how to present the material--regardless of prior inequities in skill or preparation.

After spending ten or fifteen minutes in their expert groups, the children went back to their original jigsaw groups, where they were informed that they had a certain amount of time to teach that knowledge to each other. They were also told that, at the end of that time (or soon thereafter) each person would be tested on her individual knowledge of Pulitzer's *entire* life. Clearly the students had to depend on one another to learn all their material. The process is highly reminiscent of a jigsaw puzzle, with each student possessing a single vital piece

of the big picture. Because of this resemblance, we came to refer to our system as the "jigsaw" model.

When left to their own resources in such a structured situation, the children eventually learned to teach and to listen to each other. The children began to learn two important lessons:

1. None of them could do well without the aid of every other person in that group, and
2. Each member had a unique and essential contribution to make.

Suppose you and I are in the same group. You have been dealt Joseph Pulitzer as a young man; I have Pulitzer as an old man. The only way that I can learn about Pulitzer as a young man is if I pay close attention to what you are saying. You are a very important resource for me. The teacher is no longer the sole resource; indeed, he is not even in the group. Instead, every kid in the circle becomes important to me. I do well if I pay attention to other kids; I do poorly if I don't. It's a whole new ball game.

A jigsaw classroom is not a loose, "anything goes" situation. It is highly structured. Interdependence is required. *It is the element of "required" interdependence among students which makes this a unique learning method, and it is this interdependence that encourages the students to take an active part in their learning.* In becoming a teacher of sorts, each student becomes a valuable resource for the others. Learning from each other gradually diminishes the need to try to out-perform each other because one student's learning enhances the performance of the other students instead of inhibiting it, as is usually the case in most

competitive, teacher-oriented classrooms. Within this cooperative paradigm the teacher learns to be a facilitating resource person, and shares in the learning and teacher process with the students instead of being the sole resource. Rather than lecturing to the students, the teacher facilitates their mutual learning, in that each student is required to be an active participant and to be responsible for what he learns.

Cooperative behavior does not happen all at once. It requires time and practice for children to use this technique effectively because it is not easy to break old habits. In Austin, for example, the children had grown accustomed to competing during their first four years in school; accordingly, for the first several days of jigsaw, the students tried to find a way to compete, even though competitiveness was useless--and even dysfunctional. Let us illustrated with an actual example, which is typical of the way the children stumbled toward the learning of the cooperative process.

Carlos: A Case Study

In one of our groups there was a boy whom we will call Carlos. Carlos was not very articulate in English because it was his second language. He had learned over the years to keep quiet in the classroom because, frequently, when he had spoken up he had been ridiculed by some of his classmates. In the Jigsaw method, Carlos was assigned Joseph Pulitzer's middle years. But the Jigsaw method is not magic; when it was Carlos's turn to communicate his paragraph to the other students, he had a great deal of trouble and was very uncomfortable about it. Indeed, he later told us that, early on, he actually liked the traditional way better. This is not surprising; in the system we had introduced, Carlos was

forced to speak, whereas before he could avoid discomfort simply by remaining quiet.

The existing situation was even more complex. It might even be said that the teacher and Carlos had entered into a kind of implicit conspiracy: During the first few weeks of school, the teacher had gradually learned not to call on Carlos because when she did he would stumble, stammer, and fall into an embarrassed silence, and some of the other children would make fun of him. Her decision undoubtedly came from the kindest of intentions - she simply did not want to humiliate him. But, unfortunately, by ignoring him, she had, in effect, written him off, which reinforced his counterproductive behavior. In addition, the teacher's attitude implied that Carlos was not worth bothering with--and this message was unintentionally conveyed to the other children in the classroom. Children notice things and draw their own conclusions; they came to believe that there was one good reason why the teacher was not calling on Carlos: She felt he wasn't smart enough. Indeed, it is likely that even Carlos himself began to draw this conclusion. When one looks at the dynamics of that situation, it is no wonder that research had shown that desegregation often resulted in a further decrease in the self-esteem of underprivileged minority children.

Let us go back to our six-person group. Carlos had to report on Joseph Pulitzer's middle years, and was having a very hard time. He stammered, hesitated, and fidgeted. The other children were not very helpful; they had grown accustomed to a competitive process and responded out of this old, over-learned habit. They knew perfectly well what one does when a rival kid stumbles - especially a kid from a different ethnic group whom one believes to be stupid. They ridiculed him, put him down, teased him. During our experiment a couple of the

youngsters in Carlos's group said such things as "Aw, you don't know it," "you're dumb," and "You don't know what you are doing."

In our first experiment, the groups were being loosely monitored by a research assistant who was moving from group to group. Observing this situation, our assistant intervened by saying something like: "O.K., you can say things like that if you want to; it might be fun for you, but it's *not* going to help you learn about Joseph Pulitzer's middle years, and you will be having an exam on Pulitzer's life in about 20 minutes."

Notice how the reinforcement contingencies have shifted! No longer do the children gain much from putting Carlos down, and they stand to lose a great deal. After a few days and several similar experiences, it began to dawn on the children that the *only* way they were going to learn about Pulitzer's middle years was by paying attention to what Carlos had to say. Out of necessity they gradually began to develop into pretty good interviewers. If Carlos was having a little trouble communicating what he knew, instead of ignoring him or ridiculing him, they began to ask probing questions. They became junior versions of Barbara Walters or Charlie Rose, asking the kinds of questions that made it easier for Carlos to communicate what he was thinking. Carlos began to respond to this treatment by becoming more relaxed, and as he relaxed his ability to communicate improved. After a couple of weeks, the other children realized that Carlos was not dumb, as they had originally thought, and began to respect him, open up to him, like him. Carlos began to enjoy school more and began to see the Anglo kids in his group not as show-offs and tormentors but as helpful and responsive. He began to like them.

Basic Results

What happened in Carlos' group is a good example of the technique and how it frequently worked to produce beneficial effects, but it hardly constitutes acceptable scientific data. For that, we must turn to the field experiments performed by Aronson and his colleagues in Texas and California in which the effects of the jigsaw techniques on interpersonal attraction, self-esteem, and happiness in school were investigated systematically. Initially, in Austin, the jigsaw technique was instituted in several classrooms for six weeks and assessed for its effectiveness by taking measures at the beginning and end of the period - comparing the performance of the children in the jigsaw classrooms with the performance of children in more traditional, competitive classrooms being taught by some of the most effective teachers in the school system.

This research will be described in detail later but as a preview we will tell you that the findings were quite consistent:

1. Children in the jigsaw classrooms grew to like their groupmates even more than they liked others in their classroom.
2. Both white and African American children in the jigsaw classrooms liked school better (or hate school less) than the white and black children in competitive classrooms. Absenteeism among jigsaw students decreased dramatically.
3. The self-esteem of the children in the jigsaw classrooms increased to a greater extent than that of children in competitive classrooms.

4. In terms of the mastery of classroom material, children in the jigsaw classrooms out-performed children in competitive classrooms. This difference was primarily due to improvement in the performance of underprivileged minority students; specifically, while white children performed as well in either type of classroom, black and Hispanic children performed significantly better in jigsaw classrooms than in competitive classrooms.

5. As the result of their experience in jigsaw groups, children learned to empathize with one another; that is, compared to children in traditional classrooms they found it easier to put themselves in another person's shoes and experience the world as if they were that other person.

These basic results have been replicated and extended in several school districts in different parts of the country.

While the jigsaw technique was developed as an attempt to bridge the gap between children from different ethnic groups, these results make clear that its function is not limited to multiracial situations. In any classroom situation, the jigsaw method curbs some of the undesirable aspects of excessive competition and increases the excitement children find in cooperating with one another. Thus the research demonstrated that what seemed to be a deeply ingrained kind of behavior - competitiveness - can be modified. Our aim is not to eliminate a child's ability to compete; a certain amount of competition can be fun and may, in many circumstances, enhance performance without producing negative consequences. *What we want to do is teach cooperativeness as a skill* so that when a

person finds herself in a situation where cooperativeness is the most productive strategy she will not view everyone in sight as competitors and doggedly try to defeat them.

Also, cooperative learning in general, and the jigsaw method in particular, can be a useful addition to individualized learning programs. When individualized instruction utilizes independent study it frequently results in reducing the child's opportunity to develop social skills in the learning environment. Complementing individualized instruction and other classroom experiences with cooperative groups could provide a beneficial balance as well as an interesting set of experiences. In this context, it should be noted that the children in these experiments were exposed to the jigsaw technique for only a small fraction of their time in school - often as little as three or four hours per week. The rest of the time they were learning in a generally competitive atmosphere. These results show that children can learn the skills of cooperation and that cooperative activities can have an important and beneficial effect on their lives, even when these activities are presented in a basically competitive atmosphere. This is encouraging because it means that parents and teachers do not need to choose between cooperation and competition; both can occur in the same classroom. Moreover, by working in jigsaw groups, the children learned that *it is possible to work together in a helpful way without sacrificing excellence* and that working together increases their positive feelings about themselves and their happiness in school. Finally, it is our contention that experiencing cooperativeness will increase tolerance for temporary failure both in others and in oneself; our hope is that this technique can lead to a reduction in the anxiety that is too frequently associated with performance in our society.

Basic Jigsaw 2

The Pieces of the Puzzle

Before we take a look at the jigsaw method as a whole, let us describe the various pieces that go into making up the jigsaw classroom.

Students

We have found that young children - even kindergartners - are perfectly able and willing to engage in cooperative behavior. At the same time, we should note that our attempts to institute the jigsaw technique prior to the fourth grade have not always gone smoothly. There are two major issues. First, virtually all of the students in a group need at least a minimal proficiency in reading for jigsaw to work; one cannot always count on this general proficiency among all children in the first few grades. Second, the understanding of the basic elements of jigsawing requires a certain degree of conceptual ability. While we've found that most six-year-olds can eventually grasp what is required, it often necessitates a longer period of time to thoroughly acquaint them with the system than is the case for youngsters ten years old and above.

At the upper end of the classroom continuum, there seems to be no limit. Middle school and high school level groups work particularly well. At the university level, students can be placed in jigsaw groups and meet on their own time outside of class. Each student is responsible for a portion of the reading material (a number of research articles, one aspect of a subject area, and so forth). Students then report to their group and discuss the topics. The only intervention

made by the instructor consists of a brief training session designed to spell out the degree of specificity required in the actual reporting so that a semblance of uniformity could be achieved. That is, in technical reporting it is conceivable that if the students are not instructed, some reports might be overly detailed and others might be too sparse. A brief instruction about the appropriate degree of complexity can be invaluable. Virtually all of the university students who have utilized the jigsaw opportunities reported good results: mastery of the material in far less time than if they had read it on their own, plus the added enjoyment of companionship and the intellectual stimulation brought about by the sharing of a variety of perspectives.

Another way jigsaw has been used is during "inservices" that require covering reading material in a short period of time. In this case, participants are assigned individual chapters and given time to read. Next, expert groups are formed of those assigned the first section of the material, those assigned the second part, and so forth. After discussing the key points of what they have just read, they plan the best ways to communicate this information to others. After this, groups are formed so that all the reading material is covered within a single group and each person shares her knowledge with the others. This has been used as a quick and efficient way of covering as much as an entire volume in a one-day workshop.

Curriculum

A carefully planned curriculum can go a long way toward making students' introduction to jigsaw go smoothly. Ideally the teacher will have prepared the curriculum during a school vacation or other non-teaching time, giving the task

uninterrupted attention and making the process of designing the curriculum a pleasant one. If this is not feasible; we strongly recommend that the preparation of the curriculum be completed - at least - before jigsawing actually begins.

A wide variety of subject matter can be adapted for use with the jigsaw format. On the whole, narrative material that emphasizes reading and comprehension skills is the easiest to work with in groups. Because of this, the area of social studies - including history, civics, geography and so forth - is perhaps the most naturally suited to the technique. The major skills involved are reading and comprehension. Jigsaw has been successfully used, however, in teaching math, language arts, and biology, although those subjects are more difficult to adapt.

We have also found that jigsaw works best with material that is *not* conceptually novel (requiring students to use skills they have not yet learned). Just as we would not attempt to assign *The Life of Joseph Pulitzer* to a group of six children who didn't know how to read, by the same token we would not assign "subtraction" to a group of students who had not yet acquired this skill. Thus, introducing addition or subtraction for the first time in the context of a jigsaw group is probably not a good idea, although jigsaw could certainly be used for practicing these skills. We know of teachers who have successfully employed the jigsaw method for the instruction of math, language arts, biology, English as a second language, and other subject that required new skills to be learned. In these areas jigsaw has been used primarily to review material previously taught by more traditional methods..

Another limitation involving subject matter has to do with a reading assignment which is cumulatively interwoven, by which we mean that because of the nature

of the material it would be difficult to understand part three without having first read and understood parts one and two. Thus while it is easy to grasp Joseph Pulitzer's middle years without knowing about his childhood and young adulthood, it would be far more difficult to make sense out of Chapter 3 of a detective story without having first read Chapters 1 and 2. Accordingly, if you were a fifth-grader and you were assigned part three of a story or subject matter that is, by its very nature, cumulatively interwoven, chances are you would not be able to grasp its meaning sufficiently well to communicate it meaningfully to members of your jigsaw group. *This is the key to adapting curriculum for jigsaw: whatever material is used must be divided into coherent segments that can be distributed to members of the jigsaw group.* That is, an individual piece of the lesson must be understandable to a student without knowledge of the other portions given to his groupmates.

It is advisable for the teacher to include in her weekly lesson planning the material to be covered daily in the jigsaw group and to provide additional time for curriculum preparation. Homework assignments and material to supplement the basic lesson should also be organized well in advance.

Jigsaw Cards

Almost any study material can be used for the construction of jigsaw cards. Four-by-six-inch index cards seem to be first choice. If the information is from a textbook, pages can be copied from books or other resources and glued onto the index cards with rubber cement. Pictures or other relevant material can be glued to the back of the card.

Rather than letting students pick their own cards (sometimes they will pick the one that is prettiest or has the least amount of writing) the teacher might want to pencil each student's name at the top of his card. This also helps the teacher balance the groups (including the expert groups) since she knows ahead of time who will have each part.

To provide for maximum interdependence among group members, each student should have access to other parts of the lesson only through other groups members. Clearly, if a student has already had experience with the lesson material, he will be less dependent on listening to his groupmates to learn that material.¹ If standard texts are used, the material must be cut out or reproduced, divided, and the texts collected and stored.

The amount of material used and how it is broken up are both important aspects of curriculum preparation for jigsaw. In the first few weeks, students are still adjusting to the process as well as learning content material. We suggest that at least initially the amount of information be kept quite light. After two weeks the work load can be gradually increased until a full load is reached. We have found that time lost early in the press is made up later - with interest.

¹ Robert Slavin has devised an alternative jigsaw method which he calls Jigsaw II. As with the original jigsaw, group members in Slavin's adaptation also become experts on one part of the material, meet in counterpart groups, and are responsible for their group members learning that portion of the material. However, in Jigsaw II, all students in the group read the entire assignment rather than having to depend solely on group members for the information. Group members then take individual test on the material, the results of which contribute to a team score.

How much material constitutes a full load? In our experience students can be given as much or more material using jigsaw as when using traditional teaching methods. Even when a large amount of material is to be mastered, the students seem to rise to the occasion.

The decision about how much material should be contained on each card is a particularly important one. If there is consistently too little material, there will be little challenge for the students, and they will quickly become bored with the process. On the other hand, if there is too much material, it will be difficult to cover all parts within the allotted time; this is bound to be a frustrating experience for the group. One way to avoid these extremes is equating the jigsaw cards for the number of important facts that each card contains. Thus one student may read three paragraphs and another five, but they will both be responsible for the same number of important facts. Using this method results in a student's work load varying from day to day, but we have not found this to impede the successful working of the group.

An additional policy we have found helpful is breaking up material so that a separate subject is covered each day of jigsawing (Monday - geography of China; Tuesday - Chinese family structure; and so forth). The best general advice we can give concerning the division of material is to strive for a balanced distribution among individual students and over the course of the unit.

Expert Groups

If a class is to use jigsaw an hour a day, twenty minutes of the hour should be spent in expert groups and the remaining forty minutes in the jigsaw group. At the beginning of the hour, students gather in their jigsaw groups to receive their paragraphs and any special instructions from their group leader. They then break into expert groups (consisting of those students with identical paragraphs) to plan their presentation.

Once in the expert group the students first read their cards. It is helpful to the poor readers if one person reads the card aloud. Then group members start helping each other understand the material on the card. They work on meanings of words, think up examples to explain things, and so forth. Students can ask questions about anything that is unclear. Students who grasp the material quickly are a vital resource in helping slower students learn the material. When everybody understands the information on the card, the group decides how to teach the material to the jigsaw groups. Expert group members thus get an idea of how the others are planning to present, hear some suggestions that may aid their own presentation, and give each other constructive feedback.

Expert groups have additional advantages. Even the brightest student is stimulated by the questions, examples, and trial presentations of his experts. The expert group may also be considered an effective device to remedy listlessness on one of those dull, low-energy days that descend from time to time on every classroom. A typical jigsaw group runs for a period of six to ten weeks, long enough so that the children in it may occasionally get bored with each other and may want the excitement of a temporary change in routine. On the other hand, they may decidedly not want such a change because they have become so

comfortable with their teammates; they know exactly what to expect of each other and patterns of interaction have become established and easy. In either case, the expert group challenges them to make new interpersonal adaptations without disrupting the smoothly functioning jigsaw learning group. Finally, as jigsaw group identity solidifies, the groups may be tempted to view each other competitively. Temporary restructuring with expert groups builds bonds across groups, thus helping to keep such intergroup competition from becoming pervasive.

Expert groups present several special problems, however, because they are not ongoing working units like the jigsaw groups; they change with the curriculum. Since the same people don't meet regularly, they have no chance to develop the cohesiveness that results from the team-building exercises. Initially students may have more trouble working with each other in expert groups, but as the jigsaw groups become used to working together and develop cohesion, the expert groups improve as well. As mentioned before, it is important not to develop intense feelings of competition between jigsaw groups since students from one jigsaw group will have to work with students from other jigsaw groups in the expert sessions.

There is another problem with expert groups. The students may not immediately be comfortable working with each other, particularly when the jigsaw process is new to them. They may even have difficulty getting organized and down to work. Teachers generally find it advisable to pick a responsible and capable leader even for these temporary groups. It is also helpful, on occasion, to run through a quick teambuilding exercise to establish a cooperative mood.

Once the jigsaw process becomes familiar, cooperative attitudes tend to carry over from group to group.

Expert Group Leadership

It is impossible for expert groups to have regular leaders since the group composition changes daily. Leaving the groups leaderless creates problems, however. A leaderless expert group has trouble getting organized and accomplishing the day's business. We have tried having expert groups pick their own leaders; this seems to work well with two qualifications: students who are seen as natural leaders tend always to be chosen, and when there is no natural leader among the members of the group, it seems hard for the group to get organized enough to pick any leader at all.

Otherwise, we suggest that the teacher select expert leaders before the day's session and announce them to the class. This alleviates the necessity for the group to pick its own leader and saves time in organization.

It is a good idea for students to have notebooks with them in expert groups and take very short "key word" notes. We strongly discourage, however, letting students write out what they are going to say and read it. Short notes give them about the right amount of help with their parts, and of course learning to take good notes is a valuable skill for students to have.

Jigsaw Groups

Having finished working in their expert groups, the students reassemble in their jigsaw groups. The jigsaw curriculum cards are labeled in a specific order, and the students should teach them in this order. After the jigsaw groups get back together, the student who has card number one begins presenting. If the group is restless and having trouble settling down, the group leader should make an intervention (For example: "I'd like to get started now," or "I'm having trouble hearing Mike because you're talking.") The student who is trying to present might also say something. (For example: "It makes me feel bad when you don't listen to me.")

The students in the group should be encouraged to use active listening skills. It's hard to tell if someone is listening if they are drawing pictures, looking down, and showing no overt interest in the procedure generally. A short time (five or ten minutes) should be reserved at the end of the hour for the group to discuss any problems that have arisen in the hour.

After the individual presentations, the group can review all parts together. Each student may try to think of three important points from the lesson. Or students may ask each other questions about the lesson and try to answer questions on parts other than their own. Having the students review insures that every student understands the lesson. If a review is not done, students may leave with an incorrect understanding of the information.

Finally, students in the jigsaw group should fill out the group process sheet and take five or ten minutes to discuss the day's process sheet. Process discussions are feedback sessions and allow the students to express their feelings, talk about

problems they feel the group is having, and attempt to find solutions to these problems.

Teacher as Facilitator

If the class is of average size, it probably will be divided into four to six jigsaw groups. Clearly, even with a teacher's aide, the teacher cannot be everywhere at once. The group leaders function as additional assistants to the teacher, channeling group-process skills to group members and helping organize the activities of the day.

A jigsaw teacher's goal is having students regard each other as learning resources rather than depend solely on her as instructor and leader. *She does not abandon all authority in the classroom, however.* Instead she acts as a backstage designer, creating a structure where the students may learn how best to make use of each other's knowledge and skills. In addition, she plays an important role as an information resource, one we will discuss in more detail Chapter 6. The teacher moves around the room, from jigsaw group to jigsaw group, listening, observing, and keeping alert for any problems that may develop. Whenever possible, she makes interventions in group process through the group leader, thereby validating the group leader's authority for the other students. Since getting the group to regulate itself rather than depend on the teacher is the object, interventions should help the group discover its own solutions. The teacher may phrase interventions as requests or suggestions to the group leader. (For example, "Jane, perhaps you should check to see if everyone feels they understand all the parts well enough to take a test tomorrow." Or, "Peter, maybe you should ask the group if telling John that he's stupid is helping them learn the material.")

If a group member complains directly to the teacher about someone in the group (Mr. Cross, Jane is drawing funny pictures instead of listening!"), it is not the responsibility of the teacher to solve the problem directly. The jigsaw teacher refers the problem back to the group to have them solve the problem themselves. In the example give above, Mr. Cross might ask the group leader whether group members have any idea why Jane is drawing pictures instead of listening. Perhaps the presentations are going to fast for her to understand, or perhaps she is bored because the speaker is reading his card in a dull tone of voice. Once the source of the problem has been identified, the teacher may take the group leader aside and suggest ways of solving it, or the students may be ready to take responsibility for finding their own solutions.

Teacher interventions are aide at helping students learn content more effectively and helping them develop an efficient, comfortable, cooperative process. Perhaps most important, the teacher models for the students effective jigsaw process. Through his interventions, even phrasing, tone of voice, and the kinds of suggestions he makes, the teacher provides an example students can eventually imitate in their roles as group members. The teacher can usefully make several types of interventions at different stages of the jigsaw process.

The first time expert groups meet, students may have difficulty finding effective, interesting ways of presenting their material. The teacher can help them learn how to extract important points from the printed information and think of creative ways to present what they have learned. The first time students present, they often simply read their paragraphs aloud - a boring experience for the

listeners. Some examples of teacher interventions in the first expert sessions follow:

- "Can you think of a way to put the information you just learned into your own words?"
- "Can you think of how the material you just read is related to your own life? Are there any examples in your own life you could use in explaining this to your groupmates?"
- "Do you know what you are going to say when you go back to your jigsaw group?"

Once students return to the jigsaw groups, the teacher may need to encourage them in their actual presentations. At the beginning some may have difficulty summarizing material in their own words. Even after experience in the expert group, they may simply read the paragraph aloud in the jigsaw group. You will need to remind them gently that putting the information in their own words makes their presentations more interesting and easier to follow. You should also encourage them to include the examples and interesting points discussed in the expert group and to comment on the presentation of other members.

Initially - in both expert and jigsaw groups - students may stop working together and become merely six individuals working alone who happen to be sharing a space. This may happen because they are practicing their own parts while others are talking. The teacher must emphasize that the purpose of the expert groups is for the students with the same material to help each other learn it and that jigsaw groups also are meant to be situations where the students learn from each other. The following interventions are useful in reminding students of this:

- "Are you helping one another learn the material?"
- "Is everybody in this group understanding the material you covered today?"

Sometimes very quick students finish learning the material early and withdraw from the rest of the discussion, leaving other group members to struggle by themselves. This is the time for the teacher to emphasize the student's role as teacher as well as student. The bright student need not disappear when she has learned the material. Rather she should be encouraged to spend the extra time helping other students learn. We have found that taking this role in the group can be very rewarding for bright students and prevents them from getting bored. Having students fulfill this function also helps narrow the social and communication gap between high achievers and low achievers that is often found in traditional classrooms. The following intervention is designed to encourage more able students to help their groupmates:

- "Now that you've learned the material, can you help John learn it so he can teach it to his groupmates?"

Perhaps the most important intervention the teacher will make is convincing students that fighting, teasing, and insulting each other are dysfunctional behaviors. Working in groups invariably involves some conflict. The teacher will find that some of the quicker students become impatient with those who learn more slowly; that fourth-, fifth-, and sixth-grade students have definite misgivings about cooperating with (or even sitting next to) classmates of the opposite sex; and that exiting rivalries tend to get exaggerated in the group

setting. However, as described in more detail in Chapter (what?), Jigsaw can be an excellent place to work out some of these conflicts and build understanding and harmonious relations.

There are two roles in the jigsaw classroom which merit special consideration: that of teacher and of student group leader. These two are closely related. The role of the group leader is patterned after the teacher's role; they are both "facilitators," whose function is to lead a group, help the members look at how they are working together, and examine how they can improve their interaction in order to accomplish some task. (These roles will be described in more detail in Chapter 6.) Ideally, the ultimate goal with jigsaw groups is to reach a point where a facilitator is no longer necessary because group-process skills will have been taken over by the members. In the jigsaw classroom, the teacher, as facilitator, seeks to help the children teach themselves and each other in smoothly functioning small groups. In any given classroom there may be five or six groups and, since the teacher cannot be everywhere at once, each group has a leader, a teacher's "assistant" through whom group-process skills are passed to each student, and who also acts as an organizer for the business of the day.

Finally, the role of group leader need not be a permanent one. As the interpersonal and group skills develop, group members may take turns being the leader.

Part 3

Solving Problems in the Jigsaw Classroom

While research continues to demonstrate numerous advantages of cooperative learning, this does not mean that working with it is problem free. Certain problems do occur for which teachers have devised a variety of solutions. This chapter contains a collection of some of the more common problems, together with suggestions for how they might be handled. Many of these problems are not unique to the jigsaw method and neither are the solutions. But, as we saw earlier, the jigsaw method often illuminates problems that are hidden in more competitive classroom dynamics. More importantly, though, the jigsaw method often provides solutions that otherwise would be less readily available.

Problem: The Need for Communication Skills

Teasing, feuding, putting each other down--these activities, unfortunately, are as much a part of life in the classroom as reading and math. They take place in virtually all classrooms, in all sections of the country, at all grade levels and in all classroom structures. The jigsaw group is an intimate situation, one where children work in very close association and depend heavily on each other. Because of this, conflict may seem more frequent, particularly at first, than in a competitive classroom. The great advantage of jigsaw is that this structure allows children to develop conflict resolution skills--so that they can solve their own problems as they occur. This is particularly true if these skills are emphasized as part of the school culture. Fortunately, in many school systems, children now enter the middle elementary school grades with at least a modicum of experience at conflict resolution on the playground. The importance and usefulness of having a process to solve problems is, therefore, not brand new to

them and in many cases they have already practiced many of the necessary skills. For example, many youngsters have learned not to interrupt others, that name calling and put-downs are not effective, and so on.

In a jigsaw classroom, the children are not individually isolated units. They are not forced by the arrangement of the classroom to curtail their conflicts and postpone them until recess. Moreover, any group (such as the one described in the previous chapter) has certain built-in conflicts attributable to the age of the children. Among third and fourth grade girls, best friend/best enemy conflicts sometimes interfere with classroom peace and among eleven- and twelve-year-olds, feelings of attraction and annoyance may run strong especially between children of different sex. A boy and girl may regard each other with familiar suspicion, but a degree of interest may also begin to emerge. One day they may show exaggerated horror at finding they must sit together, the next they may seem to enjoy working together, or vice versa.

Besides these complexities, there are the conflicts which arise around the task itself. A certain amount of material must be covered by tomorrow, but someone is holding back the group. Someone else is pushing ahead too rapidly and leaving the others behind in confusion. Because the jigsaw group tends to bring conflicts to the surface, it provides the setting and the tools for the children to work through those conflicts and learn something about themselves and one another in the process. Moreover, because only a few children are involved, the rest of the class need not be interrupted in its work. Accordingly, the teacher may decide to use an instance of petty quarreling as vehicle to help the children learn about how their behavior affects others.

To demonstrate how the teacher might do this, we will use a simple, unsubtle instance of negative communication. Name-calling is a great American cultural tradition. Nicknames are often seen as signs of affection. In reality, nicknames are often used to express feelings about someone, both positive and negative. We call members of our family "honey" or "sweetie" but sometimes there is cruelty attached to the names we call others. Let us suppose Jason is a boy, who like most children, watches television an average of five hours a day. In almost every show, whether a police show, cartoon, or comedy, somebody gets called a name by someone else. It may be for laughs, but Jason comes to know that name-calling is a common way of interacting with others, one that gets a reaction out of others. Life seems to mirror television: when Jason's older sister stays out too late with her boyfriend, dad might get angry and in his anger, refers to her boyfriend a slacker. And when Jason's mother opens the latest car repair bill, she might mutter something to the effect that the mechanic who failed to fix her car properly is an idiot and a thief. It is understandable that Jason comes to believe that name-calling is what you do to express displeasure. Even children with well developed conflict resolution skills that include the dictum "no put-downs", sometimes fail to recognize the sting of naming.

With such experience behind him, Jason goes to school and settles down in his jigsaw group to complete some work for the test tomorrow. But alas, Sara has her Civil War battles all mixed up. "You idiot," Jason says somewhat mildly. "I am not, you creep," Sara replies heatedly, and the task is forgotten; the squabble is on.

What is going on here? What kind of intervention is needed? It may help to look at this brief interaction as a chain of events.

Jason has some feelings and, at least in part, he expresses them. Sara perceives that his verbal behavior is directed against her, and it arouses certain feelings in her, feelings which Jason may have had no intention of arousing. It is natural for Sara, in her hurt and anger, to interpret Jason's intentions wrongly. She evaluates Jason as a person by calling him a name just as he called her a name.

Now let's fill in the particulars. By calling Sara an idiot, Jason has revealed his impatience but not his anxiety about the test tomorrow. His intention is to get Sara to hurry up and pull herself together. And, too, there may be some boy-girl anxieties in the background, barely, if at all, conscious.

But Jason's sarcasm hurts Sara's feelings. She would like to be liked and admired even though she cannot seem to keep her Civil War battles straight. She thinks Jason meant to hurt her and put her down, because he is mean, aggressive, and a boy. She masks her hurt feelings by calling Jason a creep. She wants to get even by making Jason feel small and ugly.

So the situation has escalated; the problem of covering the material in a limited time has blown up into an unpleasant personal confrontation. Jason's semi-serious, semi-teasing behavior puts Sara on the defensive and she retaliates in full anger. Now he will have to defend himself. Under such circumstances what can the teacher do? As you remember, the group we observed and described in the previous chapter was able to move past their quarrel fairly quickly, without intervention so that interference with the academic task was minimal. But suppose intervention is required. Then the teacher may decide simply to brush past the quarrel with a practical reminder of their task. On the other hand, he

may decide it is time for these interpersonal difficulties to be faced directly. In this case he would attempt two things. First, he would guide the children to an awareness of the effects they are having on one another. Second, he would help them find better ways to express their feelings. His intervention might go something like this:

Let's look at what happened. Jason said this, Sara replied that. Jason, how were you feeling when you called Sara an idiot? Were you feeling mad?

No...but she ought to hurry up, she ought to be organized by now.

So you were feeling impatient?

Yes.

I bet you were also kind of worried about that test tomorrow.

Yes.

But did teasing help Sara straighten things out?

In other words, the teacher is helping Jason focus on *his* feelings and *his* behavior, and moving away from examining what is wrong with Sara. The teacher may sense the boy-girl issue but may want to save it for a later date when the children have more experience sharing their feelings and more confidence expressing themselves. He then returns to Sara and asks how she felt when Jason called her a name. She may reply that she wanted to punch him in the mouth (a quick and common translation of feeling into fantasy action), but with help she may admit to feeling anger and finally to feeling hurt. This is because the teacher has, at least for the moment, converted a win-lose atmosphere into one where it is safe to share feelings of vulnerability. The teacher does this by his attitude as much as anything else, by being caring and

helpful and gentle. Intervention of an authoritarian nature ("Why did you do that? It's not nice. I'm ashamed of you. You know better.") has the opposite effect. Of course they know better, but they are caught in some difficult emotions and do not know what else to do.

One Solution: Learning to Make "I" Statements

Let us take a moment to clarify the theory underlying the mode of communication that we are recommending. As you know, there are two ways we commonly use the word "feel." First, we often say: I feel that you are an angry person, a wonderful fellow, or whatever. The "feeling" in this instance is really an opinion, my evaluation of judgment of *you*. But feeling has another, more basic meaning: I feel angry, sad, annoyed, happy. I am expressing *my own* primary emotion. The focus is on "I" not "you" or "he" or "she." I am saying something about my own state rather than saying something judgmental about you. It is feeling in this second sense that we think is the effective unit of communication for small-group problem solving, because it can be heard more easily by the recipient, and so is more easily dealt with. It does not arouse defensiveness in the other person so it does not result in the desire on their part to run away or to fight back. When I say that I am feeling angry, I am expressing a fact. I know my feelings, there is no guesswork involved, no theories about your character (for example: I feel frustrated rather than I "feel" you are irresponsible). Now, if you want to interact with me, you will probably be interested in my feelings rather than defending yourself from a perceived attack. You may or may not want to determine whether or not you played any part in triggering them but the focus is on the task at hand, since it would be useful (and perhaps necessary) to work this out before we can continue with our task. On

the other hand, if I deliver a judgment about you instead of exposing my feelings, you will probably not be interested in anything but your own self-defense.

Many older children are able to understand this. Younger children can simply learn to make "I" statements" rather than "you" statements, with the reasoning coming later.

To return to our classroom example, once the feelings have been clarified, the teacher might have to reassure the children that it is all right to have "bad" feelings. He could point out that everyone does, and that it is legitimate to express anger or anxiety, but that there are ways to do it that are more constructive than others. If Sara had said outright: "I feel bad when you call me that" or "That makes me mad," Jason would have known immediately that his tactic of teasing was not having the effect he intended. Moreover, he would not have had to go on to prove he was not a creep. He could, of course, ignore Sara's protest. But at least he would have to ask himself, "Is that a good choice of behavior for what I want to accomplish?"

The dialogue described above is, of course, an idealized version of the process. It is usually not that quick or complete. But a hard-working group eventually reaches a point where interactions like this are neither impossible nor infrequent. One of the beauties of any small-group arrangement is that it provides the students with an opportunity for observing their own behavior as it affects others. It also provides opportunities for learning how to handle feelings of anger, impatience, shyness, or affection. Importantly, this learning occurs while the students are learning about the Civil War or the poetry of Emily Dickinson.

The learning of communication skills is not a separate lesson in a jigsaw classroom. Rather, it enhances the mastery of the content at hand, increasing the usefulness and attentiveness of the human resources involved.¹

The "No-Put Down Classroom"

Creating an environment that is free of "put-downs" is part of the classroom management strategy of an increasing number of teachers. It also sets the stage so that group members can approach difficulties as problems to solve rather than blaming each other. As a step toward creating a "put-down free zone" some teachers have used variations on the following: students are asked to write down them all the put-downs they could think of, or the class as a whole brainstorms a list of put-downs. Once this is done, the teacher collects (or copies) the put-downs, places them in a receptacle, seals it, and disposes of it. The method of disposal varies, the a bag can be simply tossed in the garbage, or a "coffin" can be given a proper burial with an appropriate ceremony attached. These exercises serve to call attention to what is inappropriate and later a student can be reminded with, "Why, I thought that comment was dead and buried."

Problem: The Poor Reader

How do we help the poor reader, the child who may be reading one or several grade levels below her peers, and who, consequently, is suffering both in

¹ For a more detailed analysis of communication skills, see Chapter 8 in *The Social Animal* by Elliot

Aronson (W.H. Freeman, 1995).

practical and emotional terms? As schools move away from tracking students, the reading ability of the students in a single classroom may vary considerably. In a jigsaw group, some group members will inevitably find themselves dependent for vital information on a student who, because of reading problems or for whom English is a second language, cannot easily get that information to them. The problem for that relatively unskilled student is not only that he cannot read very well but also that he cannot hide the fact from his peers as he might have been able to do in a more traditional classroom. He is confronted with their impatience and their unfavorable judgments. As a result he is under pressure which potentially could inhibit his performance still further.

One Solution: Alternative Materials

There are several tactics a teacher can adopt in order to forestall such a destructive situation while at the same time increasing the flexibility of the learning environment. In a jigsaw group, anyone can make a useful contribution. For example the slower reader may be given a drawing assignment, or the teacher can assign material of different reading levels to each group, making sure that the less accomplished readers get the least difficult material. Instead of copying a unit from a text where vocabulary and concepts are set at too high a grade level, a teacher can briefly summarize a portion of the material for a poor reader. Of the material may also be recorded on cassettes. The recording could also, or instead, be assigned to quicker students to encourage in them a sense of responsibility toward their less skilled peers, while keeping them busy and challenged with an interesting, constructive task. Generally the recorded material is used in conjunction with, not instead of, written material in order to reinforce orally what the child is reading.

One Solution: Coaching

Another practice that has become common is that of student coaching with the higher-achieving students working directly with the slower students. This practice is more desirable than that of isolating a student with a tape recorder because it is yet another way to stress the development of interpersonal skills. The coaching teams are set up within each jigsaw group and serve to underscore its supportive values and the interdependency of the students. As we noted in our discussion of group composition, the benefits are mutual. The adept reader has the immediate, energizing reward of an image change: that is, he sees himself as a helper instead of as a hampered and bored student. The slower reader is being helped by someone who is more skilled but not perfect, a model within the limits of possible attainment, compared, for example, to the teacher, who is all-knowing. In our experience, this procedure opens the slow reader to learning by reducing his need to feel intimidated and defensive. This, in turn, frees him to be more attentive and take more risks in his learning, provided that his coach has learned well her interpersonal skills.

When the jigsaw process is first getting underway, the teacher will probably be the one to suggest the coaching arrangement. Eventually, as cooperation becomes an established practice, the students themselves will make the choice to work in this manner. At first it is easier to imagine a faster student offering to help than it is to imagine a slower student taking the initiative to ask for that help. However, the kind of classroom the jigsaw teacher is developing is one where all the students realize that different levels of skills at any given moment are ordinary facts of life, a cause for neither shame nor vanity. The slower

students or poorer readers often become quite accurate judges of what they can and cannot do, and are not too embarrassed to ask for help when they need it.

Once the coaching team is set up, the teacher helps the students make effective use of one another as resources. He shows them how to break a task into parts and also provides a structure for their interaction. For example, he might suggest that David first read the paragraph to Susan. Having heard the words and the rhythmical phrasing that serves to clarify content, Susan could then read the passage back. Then together they could decide on two important points and discuss how Susan is going to present them. As the teacher moves from group to group, he will want to be particularly attentive to how the coaching press is functioning. Is David getting impatient, for example, teaching down to Susan rather than working with her? The teacher may also ask the students to comment on the process: Does David find that teaching the material helps him to learn it? How does Susan think the system is working for her? Does she have any suggestions for David that would enable him to be more helpful to her? The sooner the slower students are encouraged to state their own needs and opinions, the more confident they feel, along developing a sense that they have some control over their own learning.

One Solution: Use The Expert Group

Providing a variety of materials and arranging for student coaches are two strategies for helping poor readers that have worked in jigsaw classrooms, but of course they are not unique to the jigsaw approach; they can be employed in any classroom structure. Now let us look at a solution that is unique to the jigsaw procedure; indeed, it forms a basic part of its structure. This is the expert group.

In this way, poorer readers or students for whom English is a second language are being helped by their peers, this time members of other groups who are responsible for the same section. The students in an expert group have a chance to hear the material read, are helped with the meaning of words, can share examples, and can try out their presentations. When the original jigsaw groups resume, even the slowest student has her section fairly well planned and rehearsed. Through this procedure she gains confidence. She begins to see herself as a useful member of her jigsaw group rather than the "dummy."

Problem: The Troublemaker

Inevitably in almost any classroom there will be a student who, in relation to his classmates, is immature or recalcitrant; the student who becomes known as the "troublemaker." In a jigsaw classroom we would be surprised if there were not at least one or two students who simply will not work effectively in a group or who may even go so far as to sabotage efforts at cooperation by persistent attempts at mischief. For example, Steve may have a game he likes to play: when Tametria is making her presentation, Steve makes the others laugh by mimicking her facial expressions and gestures. The leader calls him on it, not for the first time. And, also not for the first time, Steve says, with wide-eyed innocence, that he wasn't doing anything-Tracy was. Steve's repeated "sneak and defense" behavior might be an important survival tactic that he has developed at home, or it may simply be an attention-getting device. Whatever its cause, it is destructive to the group and he is exerting a powerful disruptive influence. Moreover, he is not learning anything. It would be a mistake simply to thrust Steve into a jigsaw group without preparation.

One Solution: Special Handling

Students like Steve may need to work alone for a while under close adult supervision. Teachers we have worked with have made it clear to the recalcitrant student that working in a jigsaw group is an opportunity to be earned. The student can do this by making responsible decisions about his learning situation. For example, with teacher guidance, Steve may draw up a daily contract. It can be made clear to him at the outset that he is choosing to behave in a way that will exclude him from group work. First he may simply be warned but then the consequences of his behavior will be spelled out in his contract: he is choosing, through his behavior, to be excluded from the group. Likewise, he may work his way back into the group. For example, he may agree (1) to learn the new words on page 7 and (2) to write a short paragraph on each explorer. It can be impressed upon him that these are the tasks to which he committed. The teacher then begins to introduce him to cooperative activities. Perhaps he and another carefully chosen student are assigned to make a chart for the class. The point is, teachers find it wise to exclude and then bring the Steves in their classrooms step by step toward the goal of group participation. To leave him in a group and hope for the best can be disruptive to him and to the others.

Problem: Boredom and the Bright Student

We are frequently asked what happens to the brightest students in the jigsaw situation. Don't they become impatient, bored, or resentful of the slower students? Boredom is not uncommon in elementary school regardless of the techniques being used, and it would be grossly misleading for us to imply that children working with the jigsaw process were never bored or impatient. While today's teacher is better trained than her earlier expert, she must also contend

with the higher expectancies and lower thresholds for boredom extant among most young children. No matter how gifted the teacher, how exciting the subject matter, how engrossing the activities, the classroom lacks the excitement, entertainment value, and pace of much of children's television. Moreover, because their minds are so quick, bright students tend to be among the most easily bored if events are moving too slowly for them.

One Solution: Peer Tutoring

While it may be impossible to eliminate boredom from the school experience, teachers who have used the jigsaw technique report a great deal *less* boredom among their students than is the case in a more competitive classroom atmosphere. Our data support this observation: children in jigsaw classes do like school better than children in the control classes, and this is true for the bright students as well as the slower students. There is an old adage, *docemur docendo* (he who teaches learns). This is clearly the case in the jigsaw situation. Teaching can be an exciting change of pace for a student. It frees her from being a more or less passive receptacle of information and allows her the opportunity to try a new skill. Not only does this almost certainly reduce boredom, but if introduced properly it can also reduce the impatience that bright students otherwise experience when slower students are experiencing difficulty. By developing the mind set of "teacher" the bright students can turn what might have been a boring, mark-time, impatient experience into an exciting challenge. And, as previously reported, not only does this challenge produce psychological benefits, but the learning is frequently more thorough.

One Solution

Many classrooms have students who are chronically absent yet when they are in class they need (perhaps more than most) to be included in the jigsaw groups. The bored bright student might be able to serve as a "generalist" for the group and possibly for the class. Their abilities make it likely that they would already know the material and this would give them something active and useful to do.

One other point is relevant in this context. In developing the jigsaw method special pains were taken to minimize conflict and/or resentment among students. For this reason we designed jigsaw so that, although children learn the material in a cooperative fashion in jigsaw, they are tested individually and receive individual scores rather than an average of the group score. Thus a particularly bright student has the opportunity to score individually; in no way can her score be diminished by the exam performance of a less gifted student. This aspect of jigsaw has proven itself to be congenial with the desires of most students as well as those of their parents.

While jigsaw has proven to be one good way to reduce boredom, there are other ways. Indeed, one surefire way any teacher can reduce boredom is to refuse to stick to one method, whether it is competitiveness, individually guided instruction, multimedia presentations, or cooperative learning techniques including jigsaw.

Problem: Materials

Perhaps the most difficult problem new jigsaw teachers face is that of obtaining and developing appropriate instructional materials. The usual curriculum

material must be divided into segments for the students to share. Some assignments have to be created from various resources, others can simply be reproduced from texts.

One Solution: Sharing Resources

Nearly all books on cooperative learning include sections on jigsaw and recipes useful in devising lessons in a wide variety of subjects. There are even a few books that focus on jigsaw activities alone (see Coelho, 1989). With jigsaw everything must be transferred to cards that can be handed out once class beings. This requires time, which is always a precious commodity to the teacher. More specifically, it requires the *efficient use* of time. When we get rushed, we tend to plan less and be less systematic while just the opposite behavior is most efficient.

As mentioned before, the ideal time for a teacher to prepare curriculum is when he is under no pressure to teach it, such as during vacations, and this is when most teachers do it. When time pressures are off, the creativity of the task can be enjoyed. Once these plans and materials are developed, teachers can share units with one another. When colleagues share prepared jigsaw lessons they not only save time but also model cooperation for their students. A team of teachers not only decreases the work load but also eliminates the loneliness that can develop when one is attempting something new.

There may be instances when the students themselves can help in the physical preparation of a unit, transferring materials to cards, cutting copied material into strips, and gathering illustrations. In some classrooms, a jigsaw group has been assigned the entire responsibility for a unit. In such a case, the students would

devise the assignments, decide how to divide and distribute the reading material, and create questions and exercises. This kind of organizing activity is an effective way of learning material as teachers well know from their own experience when, for example, they discover the Civil War they have managed to avoid for a lifetime is coming up in the next chapter of the seventh-grade text. However, to be able to shoulder such responsibility in a cooperative effort, the students should have some experience in the group-process techniques of jigsawing. Thus, a unit on curriculum planning might best be left until Spring.

Finally, most school districts have sponsored in-services on cooperative learning. The curriculum supervisor of a district will often know what group materials are available for each subject and level.

Problem: Other School Personnel

Most teachers learn quickly that cooperative learning is noisy. Picture this scene. Children are scattered about the room. Everybody is talking at once. Chaos. And the principal walks in. What is she likely to conclude? That the teacher must be an undisciplined person, unskilled, ineffective, for how can children learn anything in such a noisy atmosphere? Or perhaps, she thinks, the teacher does not care, is sacrificing academics and good behavior to some vague ideal of spontaneity.

Such might also be the thoughts of a non-jigsaw teacher upon observing a jigsaw classroom for the first time. The jigsaw classroom is noisy but as most experienced teachers know, there is noise that is just noise, and there is the kind of noise which is the sound of learning and living. An outsider to the jigsaw and

other cooperative learning methods may believe he is witnessing chaos when in reality he is observing creative energy released by a carefully planned structure, not youthful energy combating structure.

One Solution: Share Knowledge

Jigsaw teachers have found it useful to prepare their supervisors and colleagues for their classroom innovations. Most educators today have at least been exposed to cooperative learning ideas and techniques so explaining what you are up to is no longer difficult. Teachers have learned that it facilitates understanding when they remind the other professionals in their environment that cooperative learning encourages student responsibility. The goals of jigsaw teachers are no different from those of their colleagues. Some teachers ask their colleagues to sit in on a jigsaw group and then share their opinions as to the effectiveness of the technique in teaching the content material. All too often, classrooms and their teachers are isolated units in the school. In some schools teachers are colleagues only insofar as they hold the same degrees and work in the same building. For a jigsaw teacher to open her method to discussion gives some substance to the word "colleague." We have provided a step-by-step description of a one-day inservice later in the book so that the experience of jigsaw and the development of its component skills is available to everyone. Teachers are strongly encouraged to participate in such workshops in school teams, perhaps grade level teams. They will then have the support they need on-site as well as others with whom to share the burden of preparing materials.

Students too must be able to articulate class objectives to outsiders, particularly to those parents who say, "That's not the way we did things in my day!" To this

end, teachers and students often develop a routine for welcoming visitors and showing them around and explaining solutions to such parental concerns as grading and the appropriateness of jigsaw for their particular child.

Problem: Maintaining a Cooperative Spirit

There are times even among experienced jigsaw groups when the cooperative spirit seems to dissipate and the students lose interest. The jigsaw teacher is concerned with keeping alive a more enjoyable, more productive, and supportive mood.

One Solution: Additional Teambuilding

We mentioned earlier that a change of routine by meeting in the expert groups can be helpful. In addition, one fifth-grade teacher begins each new unit (for which new groups are usually formed) with teambuilding exercises, and once every few weeks begins the jigsaw hour with some variation on the Broken Squares exercises described earlier. This takes only five minutes, at the end of which time the students are ready to work more closely with each other. Other teachers have discovered stories or parables which inspire their students and build cooperative spirit; storytelling can teach and relax at the same time

Problem: Teacher Discouragement

We have been concentrating thus far on how to help the students. But what about the teacher? Who helps the helper? As you know, even under the most ideal circumstances, teaching is not an easy, stress-free vocation. Most teachers get discouraged for any number of reasons during the course of a school year.

This is especially so when they are initiating a new method - the pressure of new responsibilities, the insecurity of not knowing in advance what will and will not work. The advice we are about to discuss can be used effectively by any teacher using almost any technique, but the jigsaw teachers we have worked with have found it particularly helpful.

One Solution: Teacher Support Teams

For example, there is some guilt or anxiety reported by most skilled teachers, reflected in their tendency to demand perfection of themselves 100 percent of the time. They fall into a slump, the bad day of week is all their fault, they are not reaching one or two students who are having trouble. Anybody who is discouraged feels better if he can talk about it. It may seem functional for a teacher to be able to let off steam in the staff room. Unfortunately, this is not a helpful tactic if it stimulates a general "gripe" session. For example, a teacher who is momentarily discouraged may mention a student who was very disruptive that particular morning, which may elicit sympathy and support or perhaps a volley of stories that begin, "If you think that's bad, let me tell you the trouble *I'm* having." After a session of this sort, when the teachers return to their classrooms they haven't solved their problem and are likely to feel even worse.

Much more helpful than a casual coffee group commiserating together is a group of colleagues set up explicate as a support system. In our experience with teachers using the jigsaw techniques, those who were happiest and got the most out of it were the ones who were able to form a group for mutual support and consultation. Members not only support each other emotionally, but encourage rational problem solving. This creates norms to give teachers energy and

direction, and they devise a systematic method for exploring new alternatives. Being a good consultant is itself a skill, but one that can be easily acquired.

One Solution: Peer Consultation

The effective consultant hears her fellow teacher out, listens supportively, and then asks the kinds of questions that will clarify issues and generate possible solutions. Sometimes the discouraged teacher states explicitly the kind of help he is looking for. For example, he might say he is in a slump and simply wants to unburden himself. Could his colleague listen for a few minutes and say back to him what she thinks she hears him saying? Even when the teacher does not quite know what he wants, it can be very helpful to have the gist of one's own words played back by a consultant. This helps think through the problem. Then they might go on to consider the questions he could usefully ask himself in order to begin shaping a solution.

To illustrate: Carol is a student who is falling behind. Her teacher is particularly upset because Carol had started the year full of excitement and hope; this year, in this classroom, she was really going to work hard and learn something. The teacher believes he has failed her somehow. Has he? While his feelings are painful and worthy of sympathy, his question is not a particularly fruitful one in practical terms. So after acknowledging his feelings, the consultant might encourage him to ask himself: What specific learning problems does Carol have? What does the record say? What do I know about her attitudes? How could the technique we're using (jigsaw or whatever) be affecting her difficulties? Such questions developed and examined with trusted colleagues will benefit Carol. And, very importantly, because these questions are infused with practical

energy, because they reflect the teacher's power to analyze and understand a problem and to be of specific use, they benefit him by allaying his fears and combating discouragement: there *is* something he can do. In sum, while a support system gives a teacher some opportunity to vent feelings and to have a sense of being heard, most of the time is spent on specifically defining a problem and thinking about different ways to solve it.