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ABSTRACT

Desegregation and mainstreaming are both based on the assumption that the placement of minority and handicapped students in a classroom with majority and nonhandicapped students will facilitate positive relationships. The literature indicates that cooperation without intergroup competition promotes greater interpersonal attraction among both heterogeneous and homogeneous individuals than do interpersonal competition, individualistic efforts, and cooperation with intergroup competition. Cooperation with intergroup competition promotes greater interpersonal attraction than does interpersonal competition or individualistic efforts. There tends to be no significant difference between interpersonal competition and individualistic efforts in promoting interpersonal attraction among participants. (Author/JAC)

Interdependence And Interpersonal Attraction Among Heterogeneous And Homogeneous Individuals: A Theoretical Formulation And A Meta-Analysis Of The Research

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Relationships Among Heterogeneous Students

The desegregation of ethnic minorities and handicapped students begins when they walk into the regular classroom and face their white, nonhandicapped classmated for the first time. (Within this article the word "desegregation" will be used to refer both to ethnic desegregation and the mainstreaming of handicapped students, who are a minority in terms of intellectual, social, and emotional competence). Both the students being integrated and the majority students may feel apprehensive and afraid and may experience psychological discomfort and uncertainty. Desegregation is based on the assumption that through placing majority and minority students in the same school and classroom, positive relationships and attitudes among the heterogeneous students will be facilitated. Yet there is considerable disagreement among social scientists as to whether there are conditions under which physical proximity between majority and minority students will lead to constructive relationships.

There are several reasons for this disagreement. First, there has been a marked lack of theorizing concerning the conditions under which physical proximity will lead to positive or negative relationships. Many of the studies that have been conducted have not been embedded within a theoretical perspective, but rather have focused on desegregation and mainstreaming "on the average" or how it is "typically" practiced. While contact theory has been proposed by Watson (1947), Williams (1947), Allport (1954), and Cook (1969), it has received very few tests of its overall validity. It

will be discussed in the following section. Alternative theoretical positions need to be formulated to enrich and organize the research on physical proximity, interaction, and relationships among heterogeneous students.

A second reason is the inconsistency of the research findings. As will be discussed in detail later, many studies find that physical proximity between majority and minority students leads to increased rejection and dislike, while other studies find just the opposite. The inconsistency of the research findings has been highlighted by a number of reviews of the literature that have contained only a subsample of the available studies. And the researchers have added to the confusion by not studying the specific conditions on which successful desegregation may depend. Again, since researchers have primarily examined the effects of desegregation "on the average" or as "typically" practiced, there is confusion as to what alternative strategies or implementing conditions have influenced the inconsistent research findings reported.

A third reason for the disagreement among social scientists as to whether desegregation can result in constructive cross-ethnic relationships and attitudes is that traditional methods of reviewing the research have resulted in contradictory conclusions. When a social scientist takes a subsample of studies, reviews them, and states his or her overall impressions, considerable room for bias and distortion result. This issue will be discussed in a later section on meta-analysis.

Fourth, the political implications of the research have lead to a somewhat partisan approach to the research which at times has resulted in simplistic conclusions and recommendations, both pro and con. Given the strong value positions and the social turmoil involved in desegregation,

there is always the suspicion that any conclusions derived are biased by the person's political position and values.

Fifth, a variety of methodological problems have plagued research on desegregation. The inability of social scientists to identify precisely what strategies are being used within a school and to construct measures that are valid and reliable has contributed to the confusion in interpreting research on desegregation.

Sixth, much of the research on desegregation has failed to focus on instructional strategies that promote mutual respect, acceptance, and liking between minority and majority students. Perhaps the most promising instructional strategy is the use of cooperative learning experiences in which both majority and minority students participate. Cooperation is usually contrasted with competitive and individualistic efforts.

Finally, there is a void between the research findings on desegregation and their usefulness to school practitioners and educational policy makers. With the exception of cooperative learning procedures, methods used in schools that have successfully built constructive relationships between majority and minority students have often not been operationalized in a way that large numbers of teachers and administrators can easily adopt them. The lack of implementation of effective instructional procedures adds to the impression that constructive strategies for desegregation are not available. The findings of the desegregation studies have not been communicated effectively to the broader educational community.

There is a need, therefore, for:

a. A clear theoretical framework specifying the conditions under

which physical proximity and interaction will lead to positive or negative cross-ethnic relationships.

b. A complete review of the relevant research so that educators may make a judgment as to the probability of success of alternative methods of structuring interaction between minority and majority students.

c. The use of meta-analysis procedures to minimize the personal bias and political partisanship in deriving conclusions.

d. Identifying procedures that may be operationalized in ways that teachers and administrators may readily adopt and use them.

In other words, the research on desegregation and cross-ethnic relationships needs to be organized within a clear theoretical framework and completely and unbiasedly reviewed, to determine whether or not there are consistent research findings that can be communicated to educators and operationalized as practical procedures that educators can actually use.

The purpose of this article is to review and synthesize the research on the relative impact of cooperative, competitive, and individualistic learning experiences on the interaction and relationships of minority and majority students. To minimize partisanship and bias the review will be both complete and will use meta-analysis procedures to determine the actual degree of superiority of one instructional method over another.

In this article, therefore, we shall briefly review the early research on cross-ethnic relationships, define the nature and types of goal interdependence, present a theoretical model of the social judgment process among peers from different ethnic groups and between handicapped and non-

handicapped students, discuss the nature and advantages of meta-analysis procedures, and review the specific research relating goal interdependence, the social judgment process, and interpersonal attraction among heterogeneous students. A number of issues concerning the relationship between goal interdependence and interpersonal attraction is then reviewed. Finally, the overall conclusions concerning the current knowledge about the conditions under which contact among heterogeneous students will lead to positive attitudes and constructive relationships are made.

Early Research On Cross-Ethnic Contact

In 1947 Goodwin Watson published a review of the previous research and writing on intergroup relations. He concluded that contact between members of different ethnic groups was likely to be more effective in changing behavior and attitudes than were such alternative experiences as exposure to correct information or persuasive communication, given that the contact met a number of conditions. The conditions included:

1. Positive interdependence (i.e., cooperation).
2. Equal status contact.
3. Social norms favoring equalitarian cross-ethnic contact.
4. Attributes of group members that contradict prevailing stereotypes.
5. Contact that promotes interaction on a personal as well as a task level.

In the same year, Williams (1947) published a similar review with a similar list of conditions for constructive cross-ethnic contact. Many of the later reviews of the research on cross-ethnic interaction have noted similar con-

ditions (Allport, 1954; Cook, 1969).

Many of the earliest research studies used questionnaires in which respondents were asked to note their attitudes toward members of an ethnic group and then to describe the nature and frequency of their contact with members of that group (Allport & Kramer, 1946; Harlan, 1942; Mackenzie, 1948; Rosenblith, 1949). These studies indicated that it is the nature of the contact between members of different ethnic groups, not the frequency, that promotes favorable intergroup attitudes. A number of experimenters studied the effects of actual contact between blacks and whites, utilizing visiting black lecturers in classrooms (Young, 1932), meetings with black professionals (Smith, 1943), school integration (Horowitz, 1936), joint recreational activities in integrated summer camps (Yarrow, Campbell, & Yarrow, 1958; Williams, 1948), voyages of white merchant seamen serving with black seamen (Brophy, 1945), and contact within combat infantry platoons (Mannheimer & Williams, 1949; Star, Williams, & Stouffer, 1965). Somewhat later studies were based on postwar occupational and educational desegregation (Gray & Thompson, 1953; Gundlach, 1950; Harding & Hogrege, 1952; Minard, 1952; Reed, 1947; Rose, 1948; Williams & Ryan, 1954). A number of studies were also carried out in desegregated residential settings (Deutsch & Collins, 1951; Irish, 1952; Jahoda & West, 1951; Kramer, Note 1; Wilner, Walkley & Cook, 1952, 1955; Winder, 1952), indicating that the greater the degree of cooperation growing out of involuntary residential proximity between white and black residents, the more likely the development of friendly ethnic relationships. Between the years of 1950 and 1970 there were approximately forty studies on cross-ethnic interaction. These

studies have been extensively reviewed elsewhere (Amir, 1969; Clark, 1953; Cook, 1957; Stephan, 1978), and their results are inconclusive as to whether cross-ethnic contact will lead to more favorable cross-ethnic attitudes and relationships.

These early studies pointed towards interaction within a cooperative context as being a major determinant of whether cross-ethnic contact produced positive attitudes and relationships.

Goal Interdependence And Interpersonal Attraction

A key factor in determining whether desegregation promotes positive or negative relationships between majority and minority students is the way in which classroom teachers structure goal interdependence among students as they work on academic assignments. By structuring positive or negative goal interdependence or goal independence between majority and minority students during academic learning situations, teachers can influence the pattern of interaction between majority and minority students and the interpersonal attraction that develops between them (Deutsch, 1962; Johnson & Johnson, 1975, 1980).

Four goal structures have been commonly studied: (a) cooperation, (b) cooperation with intergroup competition, (c) interpersonal competition, and (d) individualistic efforts. There are two major approaches to defining these concepts, one evolving from the intrinsic motivation viewpoint of Lewin's field theory and the other evolving from the extrinsic motivation viewpoint of behavioral learning theory.

Lewin's (1935) theory of motivation postulates that a state of tension within an individual motivates movement toward the accomplishment of desired

goals. From Lewin's field theory it may be concluded that it is a drive for goal accomplishment that motivates cooperative, competitive, and individualistic behavior. Deutsch (1949, 1962), in formalizing a theory of how the tension systems of different people may be interrelated, conceptualized three types of goal structures: cooperative, competitive, and individualistic. A cooperative social situation is one in which the goals of the separate individuals are so linked together that there is a positive correlation among their goal attainments. Under purely cooperative conditions, an individual can attain his or her goal if and only if the other participants can attain their goals. Thus a person seeks an outcome that is beneficial to all those with whom he or she is cooperatively linked. A competitive social situation is one in which the goals of the separate participants are so linked that there is a negative correlation among their goal attainments. An individual can attain his or her goal if and only if the other participants cannot attain their goals. Thus a person seeks an outcome that is personally beneficial but is detrimental to the others with whom he or she is competitively linked. Finally, in an individualistic situation there is no correlation among the goal attainments of the participants. Whether an individual accomplishes his or her goal has no influence on whether other individuals achieve their goals. Thus a person seeks an outcome that is personally beneficial, ignoring as irrelevant the goal achievement efforts of other participants in the situation.

In a conceptualization based on learning theory, Kelley and Thibaut (1969) defined a cooperative structure as one in which the individual's

rewards are directly proportional to the quality of the group work. A competitive structure is one in which individuals are rewarded so that one receives a maximum reward, the others a minimum reward. An individualistic structure is one in which individuals are rewarded on the basis of the quality of their own work, independent of the work of other participants. For Kelley and Thibaut, the reward distribution motivates individuals to behave cooperatively, competitively, and individualistically.

While much of the research conducted between 1930 and 1970 indicated that cooperative interdependence was a key aspect in structuring interaction among heterogeneous individuals in a way that promoted positive relationships, there was very little theorizing about the processes through which cooperative experiences promoted interpersonal attraction between heterogeneous participants. In addition, there is an absence of careful theorizing concerning the conditions under which interaction among heterogeneous individuals will lead to positive or negative relationships. One of the major problems with the research on desegregation is the lack of an appropriate theoretical framework within which to organize the existing research and direct future research. The next section of this article, therefore, describes a general theory about the process through which heterogeneous individuals make social judgments about each other and build relationships with each other.

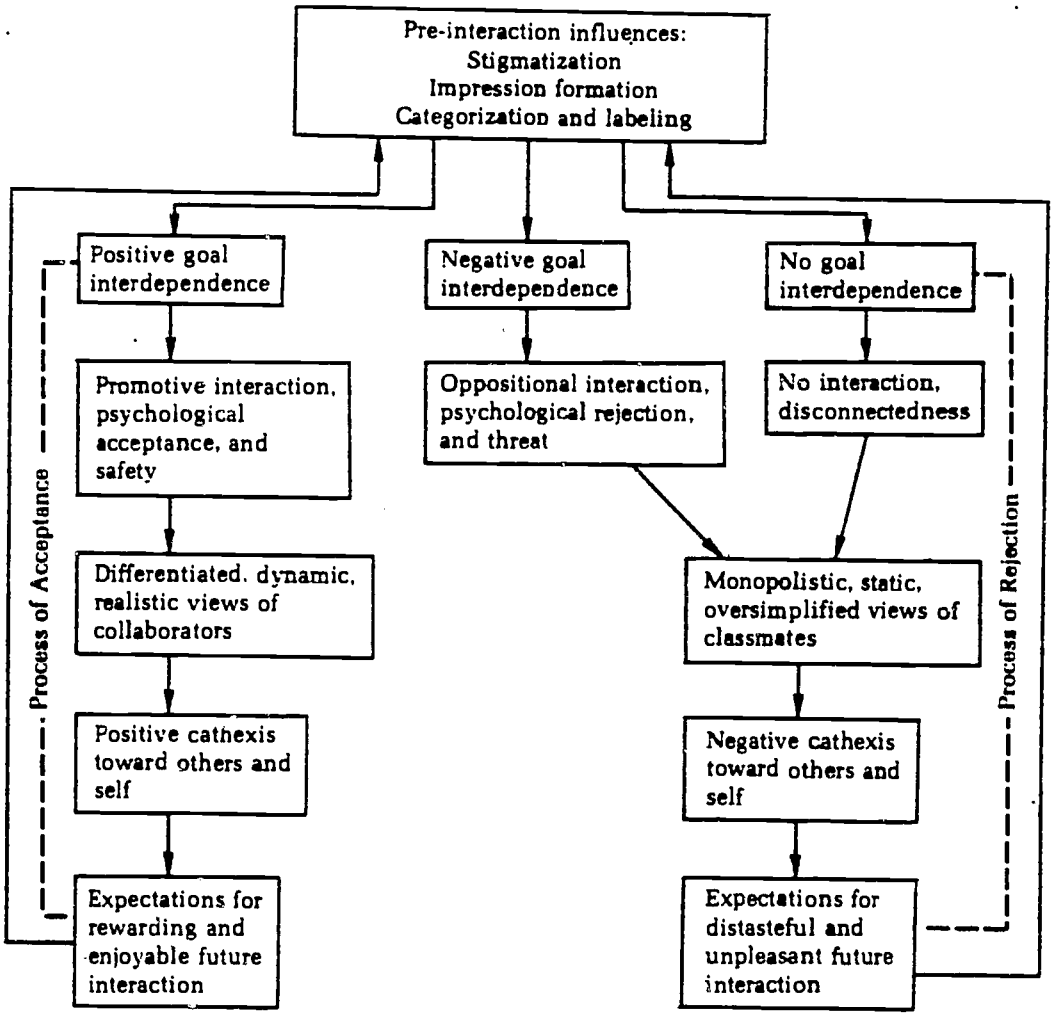
Making Social Judgments About Peers From Other Ethnic Groups

Negative attitudes toward minority peers exist before desegregation begins. First impressions and the labeling process reinforce such stigmatization. But it is the actual interaction between majority and minority

students that determines whether the rejection is strengthened or replaced by acceptance and positive attitudes. The process of making social judgments about heterogeneous peers can be described as follows (see Figure 1):

1. Majority and minority students have initial prejudice and negative attitudes toward each other.
2. A first impression is made on the basis of the initial actions and perceived characteristics of the majority and minority students.
3. Interaction occurs between the majority and the minority students. It is of great importance whether this interaction takes place within a context of positive, negative, or no interdependence.
4. Depending on the social context within which the interaction takes place, a process of acceptance or rejection occurs.
5. The process of acceptance results from interaction within a context of positive goal interdependence, which leads to (a) promotive interaction and feelings of psychological safety and acceptance; (b) differentiated, dynamic, realistic views of collaborators and oneself; (c) positive cathexis toward others and oneself; and (d) expectations of rewarding future interaction with classmates, regardless of their heterogeneity.
6. The process of rejection results from interaction within a context of negative or no goal interdependence; negative goal interdependence promotes oppositional interaction and feelings of psychological rejection and threat, and no interdependence results in no interaction with peers. Both lead to (a) monopo-

Figure 1: Social Judgment Process



listic, static, and stereotyped views of classmates; (b) negative cathexis toward others and oneself; and (c) expectations for distasteful and unpleasant future interactions with others.

7. With further interaction, the process of acceptance or rejection may be repeated.

Each of these aspects of making social judgments about heterogeneous peers is discussed below.

Pre-Interaction Influences

There can be little doubt that in the United States there is considerable prejudice and mistrust between members of majority and minority groups (Scott, 1979). When schools are desegregated, therefore, both majority and minority students have initial prejudices and negative attitudes toward each other. Own ethnic-group sociometric choices, for example, are more common than other ethnic group nominations in the 1930's (Criswell, 1939), the 1940's (Radke, Sutherland, & Rosenberg, 1950), consistently throughout the 1950's and 1960's (Springer, 1953; Morland, 1966), and in the 1970's (Gerard, Jackson, & Conolley, 1975). Even when students are asked to rate their associates as preferred playmates or work companions rather than as best friends, own ethnic group choices dominate other ethnic group choices (Singleton & Asher, 1979). As students get older, furthermore, there is an increasing solidification of own ethnic group choices over other ethnic group choices (Jelinek & Brittan, 1975; Singleton & Asher, 1979). There is evidence that white students have negative stereotypes of black students and vice versa (Bartel, Bartel, & Grill, 1973; Duncan, 1976; Patchen, Hofmann, & Davison, 1976; Sagar & Schofield,

1980).

Handicapped students are viewed by the nonhandicapped peers, furthermore, in negative and prejudiced ways, whether or not the handicapped children and adolescents are in the same or separate classrooms (Bruininks, 1978; Bruininks, Rynders, & Gross, 1974; Bryan, 1974, 1976; Goodman, Gottlieb, & Harrison, 1972; Gottlieb & Budoff, 1973; Gottlieb & Davis, 1973; Gottlieb, Semmel & Veldman, 1978; Heber, 1956; Iano, Ayers, Heeler, McGettigan, & Walker, 1974; Jaffe, 1966; Johnson, 1950; Johnson & Kirk, 1950; Miller, 1956; Novak, 1975; Rucker, Howe, & Snider, 1969; Scranton & Ryckman, 1979; Siperstein, Bopp, & Bak, 1978; Vacc, 1972). Many teachers and nonhandicapped students have negative evaluations of handicapped students and low expectations for their performance (Combs & Harper, 1967; Guerin & Szatlocky, 1974; Jones, 1972; Kelley, 1972), regardless of the amount of time spent in close physical proximity (Gottlieb, Semmel, & Veldman, 1978), the fact that the behavior of handicapped students has often been documented to be no different from the behavior of nonhandicapped students (Semmel, Gottlieb, & Robinson, in press), and the observation that the presence of students with a history of engaging in inappropriate behavior (i.e., emotionally disturbed) does not necessarily create a disrupting effect on the regular class (Saunders, 1971). There is some evidence, furthermore, that the stigmas attached to handicaps transfer across settings. Even when learning-disabled children attend new schools with new classmates they continue to be rejected (Bryan, 1976; Siperstein, Bopp, & Bak, 1978). Thus, stigmatization of each other by majority and minority students takes place even before direct contact

begins. Any categorization rule that provides a basis for classifying an individual as belonging to one social grouping as distinct from another can be sufficient to produce differentiation of attitudes toward the two groups in and of itself (Hamilton, 1976; Hensley & Duval, 1976; Tafjel, 1969, 1970).

When initial contact is made between minority and majority students, first impressions are formed on the basis of "primary potency" characteristics that overshadow much observed behavior. Such first impressions may become monopolistic (taking into account only a few characteristics), static (remaining unchanged from situation to situation), and stereotyped, or they may become differentiated (taking into account many different characteristics), dynamic (in a constant state of change), and realistic, depending on the nature of the interaction that subsequently takes place between majority and minority students. For many majority students and teachers, the perception of a student as being a member of a minority results in a monopolistic, static, and stereotyped impression that leads to a negative evaluation and low expectations for performance. Once labeled as being a minority, the strong possibility exists that the student will be rejected by majority classmates. The same is true for majority students being labeled by minority students.

Interaction Between Majority And Minority Students

Physical proximity between majority and minority students is the beginning of an opportunity, but like all opportunities, it carries a risk of making things worse as well as the possibility of making things better. Physical proximity does not mean that minority and majority students will

like and accept each other. On the other hand, physical proximity does not mean that majority and minority students will automatically stigmatize, stereotype, and reject each other. The ethnic desegregation that has occurred in the United States' schools has produced a mixture of positive, negative, and neutral results (Carithers, 1970; Cohen, 1975; St. John, 1975; Stephan, 1978). Negative outcomes seem more frequent than positive ones (St. John, 1975; Stephan, 1978), with some reviewers finding mixed results with no predominant effect and/or methodological problems so severe that no conclusion is possible (Carithers, 1970; Cohen, 1975; Schofield, 1978).

Relatively few cross-ethnic friendships seem to emerge in desegregated classrooms. Studies of direct interaction between majority and ethnic minority students indicate that same ethnic group contact is more frequent that cross-ethnic interaction from preschool (McCandless & Hoyt, 1961) through early adolescence (Schofield & Sagar, 1977). Criswell (1939) found elementary children were significantly more likely to nominate as friends other children from their own ethnic group. Singleton (Note 2), found third grade students rate a majority of same ethnic group peers as best liked. Schofield and Sagar (1977) found that ethnic membership was a significant grouping criterion even though the students and their families had chosen to attend an integrated rather than a segrated school. A typical daily observation in this study involved 138 white and 190 black students. Random distribution of these students within the occupied seats in the cafeteria would have resulted in 67 side-by-side and 41 face-to-face interethnic adjacencies. Only 13 and 9 of

the respective adjacencies were actually found. Rosenberg and Simmons (1971) report that as many as 92 percent of even third choices for friends by black students in a desegregated school are within their own ethnic group. Shaw (1973) found in a study of the fourth, fifth, and sixth grades in a recently desegregated school (in a study that lasted over a year) that association with members of the other ethnic group led to less acceptance of members of the other ethnic group. Gerard, Jackson, and Connelley (1975) found that years after the schools were voluntarily desegregated, black, white, and Mexican-American students tended not to associate with each other but rather tended to hang together in their own ethnic clusters. They found relatively few cross-ethnic friendships emerging in desegregated schools. Stephan and Rosenfield (1978a) and Gottlieb and Ten-Houten (1965) both found that desegregation typically does not lead to informal cross-ethnic contact. Stephan (1978) noted that desegregation reduced the prejudice of blacks toward whites in only 13 percent of the school systems studied; the prejudice of blacks toward whites increased in about as many cases as it decreased. Schofield (1978) and St. John (1975) noted that students in desegregated schools often become less accepting of members of other ethnic groups over time and that ethnic cleavage becomes more pronounced over time.

Consistent with the research on ethnic integration, several studies indicate that placing handicapped and nonhandicapped students in close physical proximity (e.g., the same classroom) may increase nonhandicapped students' prejudice toward and stereotyping and rejection of their handicapped peers (Goodman, Gottlieb, & Harrison, 1972; Gottlieb & Budoff,

1973; Gottlieb, Cohen, & Goldstein, 1974; Iano, Ayers, Heller, McGettigan, & Walker, 1974; Panda & Bartel, 1972; Porter, Ramsey, Tremblay, Iaccobo, & Crawley, 1978). On the other hand, there is also evidence that placing handicapped and nonhandicapped students in the same classroom may result in more positive attitudes of nonhandicapped students toward their handicapped peers (Ballard, Corman, Gottlieb, & Kaufman, 1977; Higgs, 1975; Jaffe, 1966; Lapp, 1957; Sheare, Note 3; Wechsler, Suarez, & McFadden, 1975).

During the initial interaction between handicapped and nonhandicapped classmates, furthermore, the nonhandicapped students may feel discomfort and show "interaction strain." Davis (1961), Jones (1970), Siller and Chipman (1967), and Whiteman and Lukoff (1964) found that physically nonhandicapped persons reported discomfort and uncertainty in interaction with physically handicapped peers. Nonhandicapped individuals interacting with a physically handicapped (as opposed to physically nonhandicapped) person have been found to exhibit greater motoric inhibition (Kleck, 1968); greater physiological arousal (Kleck, 1966); less variability in their behavior, terminating interaction soon, expressing opinions not representative of their actual beliefs, fewer gestures, and more reported discomfort in the interaction (Kleck, Ono, & Hastorf, 1966); and in the case of a person said to have epilepsy, greater maintenance of physical distance (Kleck, Buck, Goller, London, Pfeiffer, & Vukcevic, 1968). Jones (1970), furthermore, found that nonhandicapped college students who performed a learning task in the presence of a blind confederate (as opposed to a sighted confederate) reported stronger beliefs that they would have performed better on the task if the blind person had not been present,

even when the actual performance data indicated that the presence of a blind or sighted person had no significant effects on the college students' achievement.

The nonhandicapped students may not be the only ones experiencing interaction strain in the mainstreaming situation. Comer and Piliavin (Note 4) found that handicapped students feel tension and discomfort when interacting with nonhandicapped peers. Farina and associates (1971) found that when mental patients believed that another person knew of their psychiatric history (as opposed to believing that another person did not know) they felt less appreciated, found the task more difficult, and performed at a lower level. Moreover, objective observers perceived them to be more tense, anxious, and poorly adjusted than the patients who believed that their partners did not know their psychiatric status. In a previous study, Farina, Allen, and Saul (1968) demonstrated that merely believing that another person views one in a stigmatized way creates expectations of being viewed negatively by others and rejected by them.

Another aspect of interaction between nonhandicapped and handicapped students is that the norm to be kind to the handicapped may result in overfriendliness by nonhandicapped students in initial encounters, which usually decreases with further interaction (Kleck, 1969). Handicapped students tend not to receive accurate feedback concerning the appropriateness of their own behavior and tend not to experience the normal behavior of nonhandicapped peers (Hastorf, Northcraft, & Picciotto, 1979) and may, as a result, become socially handicapped and believe that other people

like them less the better those others get to know them.

Finally, there seems to be considerable ambivalence on the part of the nonhandicapped when interacting with the handicapped. In their review of the relevant research, Barker, Wright, Meyerson, and Gonick (1953) concluded that public, verbalized attitudes toward the handicapped are favorable on the average, whereas deeper, unverbalized feelings are frequently rejectant, a conclusion that is also made by Wright (1960). Doob and Ecker (1970) reported that nonhandicapped subjects were more willing to help a person with an eyepatch than a person without an eyepatch, but only when the helping did not entail sustained social contact. Gergan and Jones (1963) did an experiment in which nonhandicapped subjects displayed amplified positive or negative reactions to stimulus persons described as mental patients when the latters' behavior had had either favorable or unfavorable consequences for the subjects. Presumably, the stimulus person's behavior "split" the subject's ambivalent attitude so that one component was suppressed and the other component was enhanced. A similar amplification of either positive or negative responses was found by Dienstbier (1970) when white students interacted with black peers.

Both the research on cross-ethnic and cross-handicap interaction are consistent. Promoting constructive interaction and relationships requires something more than simple proximity. Placing majority and minority students in the same classroom may be a necessary condition for promoting positive relationships, but it does not seem to be a sufficient condition.

The Process of Acceptance

Promotive Interaction. The first step in promoting positive attitudes between majority and minority students is to create promotive interaction between the two groups of students. There is evidence that promotive interaction results from placing both majority and minority students in small, heterogeneous learning groups and instructing them to complete a lesson jointly while ensuring that all group members master the assigned material. Working cooperatively with peers (compared with competing or working individualistically) has been found to create a pattern of promotive interaction in which there is (Johnson, 1980; Johnson & Johnson, 1975, 1978): more direct face-to-face interaction among students; an expectation that one's peers will facilitate one's learning; more peer pressure toward achievement and appropriate classroom behavior (such as encouragement to work hard on assignments); greater sharing of each other's resources; more reciprocal communication and fewer difficulties in communicating with each other; less hostility, both verbal and physical, expressed toward peers; greater emotional involvement in and commitment to completing the assignments; more openmindedness to peers and willingness to be influenced by their ideas and information; greater exchange of information and more optimal use of the information provided by peers; more positive feedback to and reinforcement of each other; and more actual helping, tutoring, assisting, and general facilitation of each other's learning.

Perceived Acceptance And Psychological Safety. One of the results of promotive interaction is that students experience greater feelings of

psychological safety and perceive greater acceptance from peers and adults. Cooperative learning experiences, compared with competitive and individualistic ones, have been found to result in stronger beliefs that one is personally liked, supported, and accepted by other students, that other students care about how much one learns, and that other students want to help one learn (Cooper, Johnson, Johnson, & Wilderson, 1980; Gunderson & Johnson, 1980; Johnson & Johnson, 1981a, 1981b, 1982b; Johnson Johnson, Johnson, & Anderson, 1976; Johnson, Johnson, & Tauer, 1979; Johnson, Skon, & Johnson, 1980; Skon, Johnson, & Johnson, 1981; Smith, Johnson, & Johnson, 1981; Tjosvold, Marino, & Johnson, 1977). Attitudes toward coopeartion, furthermore, are significantly related to believing that one is liked by other students and to wanting to listen to, help, and do schoolwork with other students (Johnson & Ahlgren, 1976; Johnson, Johnson, & Anderson, 1978). Many of these same studies found evidence that students within cooperative learning situations or with cooperative attitudes perceive teachers as being more supportive and accepting, both academically and personally, than do students in competitive or individualistic learning situations. Finally, there is some evidence that cooperation promotes a lower fear of failure and higher psychological safety than do the other two goal structures (Johnson & Johnson, 1975).

Differentiated, Dynamic, Realistic Views of Collaborators. It is posited that negative labels and stereotypes lose their primary potency when a view of the person becomes highly differentiated, dynamic, and realistic. A differentiated, dynamic, and realistic impression includes many different categories; each category is assigned a weight as to its

importance according to the demands of any specific situation, and the weight or salience of each category changes as the requirements of the situation change. New information concerning the person is admitted to one's impression as it becomes relevant. The conceptualization of a stigmatized peer stays in a dynamic state of change, open to modification with new information, and takes into account situational factors. Worchel (1979) suggests that one of the principal mechanisms by which cooperative experiences influence intergroup relations is through reducing the salience of intergroup distinctions. The "we" feeling developed within cooperative groups may outweigh the "they" perceptions between majority and minority students. Katz (1976) makes a similar statement, stating that getting to know members of other ethnic groups may reduce the tendency to generalize negative characterictics to all of the members of the ethnic group. Stephan and Rosenfield (1980) state that varied experiences with different members of other ethnic groups should increase the complexity of one's perceptions of the ethnic group and undermine any belief that most members of the ethnic group fit one stereotype. Armstrong, Johnson, and Balow (1981) found a more differentiated view of handicapped peers resulting from a cooperative, compared with an individualistic, learning experience. Ames (1981) found that within a cooperative situation participants seemed to have a differentiated view of collaborators and tended to minimize perceived differences in ability and view all collaborators as being equally worthwhile, regardless of their performance level or ability.

It is also posited that when minority and majority students work

closely together, the boundaries of ethnic background become more and more clear. While considerable misperception as to the nature of ethnic membership may take place when majority and minority students compete or stay isolated from each other, the intensive promotive interaction under positive goal interdependence tends to promote a realistic view of each individual involved.

Positive Cathexis Toward Others And Oneself. A direct consequence of positive interdependence is promotive interaction where students facilitate the achievements of each other's learning goals. Actual goal facilitation (Deutsch, 1962), expectations of goal facilitation (Johnson & S. Johnson, 1972), and high effort exerted to facilitate one's goal achievement (Johnson, Johnson, & Tjosvold, 1981), result in a positive cathexis in which the positive value attached to the actual or anticipated goal achievement becomes generalized to the other participants. The research conducted comparing the relative efficacy of cooperative, competitive, and individualistic goal structures on interpersonal attraction is reviewed in depth in another section of this article.

It may also be posited that individuals cathect positively to their own actions when those actions are aimed at achieving their goals and that the positive value attached to the actual or anticipated goal achievement becomes generalized to themselves as persons. Such feelings of self-worth and self-value may be considerably reinforced by the awareness that one's peers also value one's actions and perceive one as being worthwhile. The impact of peer evaluations may be especially powerful for individuals who have a history of failure (Turnure & Zigler, 1958). There is evidence

that cooperative learning situations, compared with competitive and individualistic ones, promote higher levels of self-esteem and healthier processes for deriving conclusions about one's self-worth (Blaney, Stephan, Rosenfield, Aronson, & Sikes, 1977; DeVries, Lucasse, & Shackman, Note 5; Geffner, 1978; Gunderson & Johnson, 1980; Johnson & Ahlgren, 1976; R. Johnson & Johnson, 1981; Johnson, Johnson, & Anderson, 1978; Johnson, Johnson, & Scott, 1978; Johnson & Norem-Hebeisen, 1977; Slavin & Karweit, Note 6).

Positive Expectations Toward Future Interaction. The final aspect of the process of acceptance is that it promotes expectations toward rewarding and enjoyable future interaction between majority and minority students. Johnson, Johnson, and Scott (1978) found that students in the cooperative group picked peers with whom they had already worked cooperatively, even when those peers were far less academically able than other classmates.

The Process of Rejection

The process of rejection is also summarized in Figure 1. When majority and minority students are first placed in the same classroom, they view each other in stigmatized ways that dominate initial impressions and lead to the formation and reinforcement of monopolistic stereotypes that are static and that overshadow much of the observed behavior. This initial tendency toward the rejection of the students from ethnic backgrounds different from one's own is perpetuated and strengthened when students are instructed to work alone with the purpose of either outperforming their peers (i.e., competition) or achieving a preset criterion of excellence (i.e., individualistic learning). The evidence reviewed supporting the process of acceptance also supports the process of rejection, as the evidence is largely comparative.

When cooperative learning was found to be more effective, competitive and individualistic learning were found to be less effective. The specific studies, therefore, are not rediscussed in this section.

Oppositional Interaction. When students are placed in a competitive situation, an oppositional interaction pattern results in which they try to obstruct and frustrate each other's goal accomplishment. Competing (compared with cooperating and working individualistically) with peers had been found to create a pattern of oppositional interaction in which there is (Johnson, 1980; Johnson & Johnson, 1975, 1978): infrequent face-to-face interaction, misleading or threatening communication and information exchange (or none at all), obstruction of others' productivity, peer influences against achievement, low utilization of others' resources, low trust among participants, high emotional involvement in and commitment to achievement only by the few participants who have a chance to win, more hostility expressed toward peers, and more closed-mindedness to peers and less willingness to be influenced by them. Such an interaction pattern promotes feelings of psychological threat and perceptions of being rejected and nonsupported by peers.

No Interaction. When students are placed in individualistic learning situations they are instructed to work alone independently from the efforts of peers and to seek help and assistance from their teacher without interrupting their peers' efforts to achieve at a preset criteria of excellence. Such a learning structure tends to eliminate interaction among students. Such isolation leads to feelings of psychological threat and feelings of being disconnected and alienated from peers.

Monopolistic, Static, Oversimplified Views Of Classmates. It is posited that competing with classmates or working individualistically in their presence, will reinforce initial stigmatizing and stereotyping so that monopolistic, static, and oversimplified views of members of other ethnic groups tend to result. A monopolistic, static, and oversimplified impression includes only one or a few categories; the categories are weighted the same in all situations. The ease with which this happens leads Allport (1954) to state that humans operate under the "principle of least effort," which means that monopolistic impressions are easier to form and maintain than are differentiated impressions. Monopolistic impressions, by their very nature, are static due to their rigid weighting of a few characteristics of primary potency regardless of the demands of the current situation. Monopolistic impressions, by their very nature, are also oversimplified.

Competitive and individualistic experiences probably tend to reinforce the importance of status characteristics (such as reading and math ability and ethnic membership) in the process of relationship formation; this would tend to strengthen the power and prestige of high achieving students at the expense of less advantaged, or minority students. Cohen (1980) states that on the average, minority students may be lower achievers and more physically demonstrative than are majority students. The findings of Gerard and Miller (1975) and Stephan and Rosenfield (1979) indicate that white students are usually from higher socioeconomic status backgrounds, have higher academic achievement scores, and are accorded more status and respect by the faculty and staff of the school. These status differentials tend to reinforce negative stereotypes of minority students. Mumpower and Cook (1978) cite several

unpublished studies by school districts that members of disadvantaged minority groups sometimes enter newly desegregated situations with performance handicaps. Ames (1981) found that winning in a competitive setting produced self-aggrandizement while losing lowered students' self-perceptions of their ability and satisfaction. Winners tended to judge their ability as being significantly higher than did losers. Students in competitive situations tended to focus primarily on differences in ability in their evaluations of each other, and they tended to perceive the nonwinners as being less deserving of reward. Nonwinners tended to perceive the winners as being more satisfied than themselves.

Both competitive and individualistic learning activities (with their emphasis on rows-by-columns seating arrangement, strict rules against movement and talking, and individual seatwork) provide little or no information about students' different ethnic groups, thus allowing initial stereotypes to continue. What little information that is available is likely to confirm existing stereotypes and the boundaries of ethnic membership tend not to be clarified. Unrealistic and oversimplified views of members of other ethnic groups tend to be promoted.

Negative Cathexis Toward Others And Oneself. A direct consequence of negative and no goal interdependence is oppositional interaction where students obstruct the achievement of each other's learning goals or no interaction at all where students are indifferent to and alienated from the achievement of each other's learning goals. Actual goal frustration (Deutsch, 1962), expectations of goal frustration (Johnson & S. Johnson, 1972), and high effort exerted to frustrate one's goal achievement (Johnson, Johnson &

& Tjosvold, 1981), result in a negative cathexis in which the negative value attached to the actual or anticipated failure to achieve one's goals becomes generalized to the other students. When there is no goal interdependence among students and students work individualistically but in close proximity to each other, students tend to like peers who appear to be similar and tend to dislike peers who appear to be different from them (Johnson & S. Johnson, 1972; S. Johnson & Johnson, 1972). The perceived ethnic differences result in a negative cathexis and rejection of members of other ethnic groups. The research conducted comparing the relative efficacy of cooperative, competitive, and individualistic goal structures on interpersonal attraction is reviewed in depth in another section of this article.

It may also be posited that individuals cathect negatively to their own actions when those actions result in failure and are meaningless, and they may generalize such negative evaluations to themselves as persons. There is evidence that competitive and individualistic learning situations result in lower self-esteem than do cooperative learning experiences (see the section on positive cathexis). Norem-Hebeisen and Johnson (1981) found attitudes toward competition to be related to conditional self-acceptance while cooperative attitudes were found to be related to basic self-acceptance while individualistic attitudes were found to be related to basic self-rejection. This later finding was also indicated by the data gathered by Johnson and Norem-Hebeisen (1977). Ames, Ames, and Felker (1977) found that failure in competitive situations promotes increased self-derogation.

Negative Expectations Toward Future Interaction. The final aspect of

the process of rejection is that it promotes expectations toward negative, frustrating, and unpleasant future interaction between majority and minority students.

Need For A Comprehensive Review Of Available Research

School desegregation is based on the assumption that through placing majority and minority students in the same school and classroom, positive relationships and attitudes among students from different ethnic groups will be facilitated. There is, however, disagreement as to whether physical proximity between majority and minority students can lead to constructive cross-ethnic relationships. The disagreement continues partly because there is a lack of a clear theory as to the conditions under which cross-ethnic interaction will lead to constructive or destructive relationships, the research findings seem inconsistent, and there is a lack of practical strategies based on validated theory for educators to use. The early research on cross-ethnic interaction pointed towards cooperative experiences as a major influence on the resulting relationships. Cooperation is usually contrasted with competitive and individualistic situations. It is not enough, however, to simply review the research on cooperative, competitive, and individualistic goal structures and cross-ethnic relationships. The research has to be placed within a theoretical framework that gives it meaning and reveals its consistencies. The social judgments majority and minority students make about each other will increase or decrease the constructiveness of their relationships.

When majority and minority students are placed in the same classroom, they carry with them the prejudices and stereotypes prevalent in our society.

First impressions are made on the basis of characteristics of primary potency and may become monopolistic, static, and stereotyped, or differentiated, dynamic, and realistic, depending on the nature of the interaction that subsequently takes place between majority and minority students.

Direct interaction between majority and minority students is an opportunity to reduce prejudice and stigmatization. There are ways of structuring interaction between majority and minority students so that constructive and supportive peer relations or so that destructive and rejecting peer relations result. When learning situations are structured cooperatively, students interact more promotively such as by helping each other learn, students perceive greater support and acceptance from peers and experience a higher level of psychological safety, students tend to have a more differentiated, dynamic and realistic view of students from other ethnic groups, more positive cross-ethnic relationships form, and students expect more future rewarding and enjoyable interactions with each other.

Given this theoretical model, the research must be reviewed to determine whether the model is valid or not. This research has been reviewed before by social scientists who cite their own studies and selected others to substantiate their claims that the procedures they recommend are the most valid. Such reviews are open to the criticism that their conclusions are distorted as too few studies have been included in any one review to portray accurately the overall empirical findings in the area. Since each reviewer included only a subset of possible studies, their theoretical view and possible biases may have influenced them to include only studies that

supported their position and to exclude studies that may have contradicted their beliefs. The previous reviewers have also made little attempt to systematically identify the variables that may influence the effectiveness of cooperative, competitive, and individualistic efforts, although they have speculated about a range of variables that could moderate or mediate the effectiveness of the goal structures. Finally, the previous reviewers have ignored the issue of relationship strength, which may have allowed weak disconformation to be equated with strong confirmation or the equal weighting of conclusions based on a few studies with conclusions based on several dozen studies.

Given the disagreement among social scientists as to whether desegregation can effectively produce constructive cross-ethnic relationships, and the basic limitations of the previous reviews of the impact of cooperative, competitive, and individualistic goal structures on interpersonal attraction among members of different ethnic groups, there is a need for a comprehensive review of the existing research which is embedded in a theoretical model and which uses a more powerful method of combining results than summary impression. The best methodology for such a purpose is meta-analysis, which examines the magnitude of any differences between conditions as well as the probability of finding such differences.

In the next section the nature of meta-analyses used in this review is explained. A review of the relative impact of cooperative, competitive, and individualistic goal structures on cross-ethnic relationships is then presented. In order to provide some perspective on the research

studies reviewed, reviews of the comparable research on the integration of handicapped students into the regular classroom and the evidence concerning the impact of the goal structures on homogeneous samples of studies are also presented.

Meta-Analysis

Traditionally, research reviews in psychology and education have focused on the summary impressions gleaned by the reviewer from a reading of related studies. Meta-analysis provides a quantitative alternative to this approach. Glass (1976) defines meta-analysis as the combining the results of independent experiments for the purpose of integrating the findings. A meta-analysis is conducted on a group of studies that are related through sharing a common conceptual hypothesis or operational definitions of independent or dependent variables. A meta-analysis usually (a) results in a significance level that gives the probability that a set of studies exhibiting the found results could have been generated if no acutal relation existed, or (b) describes the degree of overlap between experiemental groups. Thus, when used to examine a compete survey of studies from a specific research area, meta-analysis procedures allow both a characterization of the tendencies of the research as well as information about the magnitude of any differences among conditions.

Meta-analysis is especially applicable to the research on goal structures and cross-ethnic relationships as there is considerable research that used conceptually similar variables, which allows reliable application of statistical procedures. A meta-analysis should allow for more precise and confident statements about the relative effects of cooperative, competitive,

studies reviewed, reviews of the comparable research on the integration of handicapped students into the regular classroom and the evidence concerning the impact of the goal structures on homogeneous samples of studies are also presented.

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Meta-analysis is especially applicable to the research on goal structures and cross-ethnic relationships as there is considerable research that used conceptually similar variables, which allows reliable application of statistical procedures. A meta-analysis should allow for more precise and confident statements about the relative effects of cooperative, competitive,

and individualistic experiences on interpersonal attraction between majority and minority participants.

Method

Meta-Analysis Procedures

We use three methods of meta-analysis: the voting method, the effect-size method, and the *z*-score method. For the voting method, each study was read carefully, and all findings considered by the original author(s) to be significantly positive, significantly negative, or non-significant were counted. If a plurality of findings fell into one of these three categories, the modal category was declared the winner and assumed to give the best estimate of the direction of the true relation between the independent and dependent variables. Although this is a common method of reviewing literature, the practice of declaring the modal category ignores sample size. Large samples produce more statistically significant findings than do small samples. The voting method also disregards information about the strength and importance of relations among variables.

For the effect-size method the difference between the means of pairs of treatment conditions is divided by the within-group standard deviation of the treatment conditions, yielding a standardized mean difference (Glass, 1977). In this review, the estimate of the within-group total standard deviation is the weighted by condition sample size average of standard deviations for all groups. The effects size for each finding of a study was treated as an observation and examined statistically in relation to characteristics of the study. The effect size allows for the examination of the strengths of the relations between the independent and dependent variables.

The z-score method was originially developed by Stouffer (1949) and comprises the following steps: (a) compute the exact p value of the test statistic used by the author(s) of each study, obtaining a one-tailed p by dividing exact p value by two if a two-tailed test was reported; (b) compute the exact z-score of each p value; (c) sum these z-scores, and divide this sum by the square root of the number of findings involved; and (d) refer this z-score back to the table, and record the appropriate probability level. This probability describes the likelihood that the results of all studies were generated by chance. The z-score results are understated, as many studies did not include the specific t , F , or χ^2 scores; therefore, nominal rather than exact p values had to be used. A fail-safe n was also calculated; this procedure determined how many additional studies with summed z-scores totaling zero were needed to raise the overall probability level of a Stouffer score above the .05 level.

Selection of Studies

This review includes every study that (a) was available to us, (b) contained interpersonal attraction data, and (c) compared two or more of the three goal structures. A few additional studies, in which we judged the independent variables to be cooperative, competitive, or individualistic, were included even though the conditions were not so labeled by the authors. No study was excluded on the basis of poor methodology or quality.

Ratings of Characteristics

A number of variables were believed on theoretical grounds to contribute to the relation between the goal structures and interpersonal attraction. In addition, few demographic variables were identified as being of interest.

The theoreitcal and demographic variables were recorded for each study that contained the relevant information. The variables recorded were grade level, year the study was published, sample size, whether the study was conducted in a laboratory or a field setting and whether random assignment or intact classes were used in field settings, duration of the study, subject area, type of task, whether the task required resource sharing, whether the task created interdependence among subjects, whether division of labor was used to complete the task (means interdependence), whether on-task interaction took place among subjects, the ability composition of groups, the ethnic composition of groups, the sex composition of groups, whether symbolic or tangible rewards were used, the divisible/unitary nature of the task, cognitive differentiation, racial differentiation, author, group size, cognitive rehersal, peer tutoring, peer encouragement, maximum optimization, cognitive group composition, response type, and setting. These variables are defined in the results section.

Conditions

Four conditions were compared: cooperation, cooperation with intergroup competition, interpersonal competition, and individualistic effort.

Rater Reliability

Two judges independently read all of the articles included in this study. Ten articles were randomly selected and both judges independently read the articles and made the 20 ratings needed for each study (200 ratings in all). The interrater agreement was 95 percent.

Analyses

Our primary purposes are (a) to determine the relative efficacy of the four goal structures on influencing interpersonal attraction and (b) to ex-

amine correlates or the differences among the goal structures in an attempt to understand better the reasons the different goal structures are effective. The three meta-analyses were conducted to accomplish the first purpose. To accomplish the second purpose, preliminary analyses examined the distribution of the various characteristics and eliminated variables for which there were either too few observations or little or no variability in responding. The preliminary analyses were also used to cluster variables in meaningful ways so that they could be analized either by analysis of variance (ANOVA) or by correlational techniques. For example, the year-of-publication variable was divided into intervals of approximately 10 years, so curvilinear as well as linear effects could be examined by ANOVA. The characteristics related to the dependent measures were then included as predictors in multiple regression analyses.

Dependent Measures

Within the studies reviewed a variety of measures of interpersonal attraction were used. Both nomination and roster rating sociometric measures appeared in the studies reviewed, likert scale items indicating liking, attitude scales indicating liking, attitude scales indicating perceptions of being liked or accepted by peers, and direct observations of positive interaction during instruction and free-time.

Results

Four sets of meta-analyses were conducted on studies comparing the relative impact of two or more goal structures on interpersonal attraction between (1) majority and minority subjects, (2) handicapped and nonhandicapped subjects, and (3) homogeneous subject populations (in terms of ethnic membership and nonhandicapped status). The results of all studies were combined for an overall set of meta-analyses. In all cases, meta-analyses were conducted for the voting-method, the effect-size method, and the unweighted z-score method.

Cross-Ethnic Relationships

Thirty studies were found and reviewed comparing the relative effects of two or more goal structures on interpersonal attraction between majority and minority students. These studies yielded 104 findings. The results from Table 1 indicate that not enough studies have compared cooperative with and without intergroup competition to make any conclusions as to their relative effects on cross-ethnic interpersonal attraction.

The second comparision was between cooperation and interpersonal competition. From Table 1 it may be seen that cooperation tends to promote more positive attitudes between majority and minority students than does interpersonal competition. The voting-method favors cooperation by a score of 29 to 1, with 24 no differences. There is an effect-size of .54 favoring cooperation, indicating that on the average, subjects working cooperatively with each other had more positive cross-ethnic attitudes at .54 of a standard deviation above the average subjects competing with each other or at the 71st percentile of the competitive condition. There is a z-score of 10.33 favoring cooperation, indicating that the probability of the difference being

due to chance is less than .0001. The fail-safe n for such a finding is 1,617 (this is the number of additional studies with summed z-scores of zero needed to produce a nonsignificant z, see Rosenthal (1979).

When cooperation with intergroup competition was compared with interpersonal competition the results indicate that cooperation with intergroup competition promotes more positive attitudes between majority and minority students than does interpersonal competition. The voting-method favors cooperation by a score of 18 to 0 with 11 no differences. There is an effect-size of .40 favoring cooperation, indicating that the average subjects cooperating with each other had more positive cross-ethnic attitudes at .40 of a standard deviation above the average subjects competing with each other or at the 66th percentile of the interpersonal competition condition. There is a z-score of 9.15 favoring cooperation, indicating that the probability of the difference being due to chance is less than .0001. The fail-safe n for such a finding is 509.

The fourth comparison favors cooperation over individualistic efforts. The voting-method favors cooperation over individualistic efforts by a score of 19 to 0 with 6 no-differences. There is an effect-size favoring cooperation of .68, indicating the average subjects cooperating with each other had more positive cross-ethnic attitudes at .68 of a standard deviation above the average subjects working individualistically, or at the 75th percentile of the individualistic condition. There is a z-score of 10.08 favoring cooperation, indicating that the probability of the difference being due to chance is less than .0001. The fail-safe n for such a finding is 695.

When cooperation with intergroup competition was compared with individualistic efforts the results favored cooperation. The voting-method favors

cooperation by a score of 3 to 0 with 1 no difference. There is an effect-size of .60 favoring cooperation, indicating that the average liking between majority and minority peers in the cooperative condition was at .60 a standard deviation above the average liking between majority and minority peers in the individualistic condition, or at the 73rd percentile. The z-score of 5.36 favors cooperation, indicating that the probability of such a finding being due to chance is less than .0001. The fail-safe n for such a finding is 29.

Insert Table 1 About Here

Finally, the comparison of interpersonal competition and individualistic efforts favors competition. From Table 1 it may be seen that the voting-method favors competition by a score of 4 to 1 with 2 no differences. There is an effect-size of .21 favoring competition, indicating that the level of liking between majority and minority students in the competitive condition is at the same level as cross-ethnic liking at the 58th percentile in the individualistic condition. The z-score of 3.05 favors competition, indicating that the probability of the difference being due to chance is less than .01. The fail-safe n for such a finding is 17.

Mainstreaming

Twenty-three studies comparing the relative effects of two or more goal structures on interpersonal attraction between handicapped and nonhandicapped students were found and reviewed. These studies yielded 87 findings. There are six studies that contained data concerning both cross-ethnic and cross-handicap interpersonal attraction. These studies are included in both analyses, but only one set of findings is included when cross-ethnic, cross-

handicap, and homogeneous findings were all added together. Thus, there is some overlap between the cross-ethnic and the mainstreaming findings. From Table 2 it may be seen that there are no studies comparing cooperation with and without intergroup competition.

Insert Table 2 About Here

When cooperation is compared with interpersonal competition, the results favor cooperation with a voting-method score of 14 to 0 with 9 no differences; an effect-size of .86, indicating that the cross-handicap liking at the 50th percentile in the cooperative condition was comparable to the cross-handicap liking at the 81st percentile in the competitive condition; and a z-score of 7.88 ($p < .0001$). The fail-safe n for such a finding is 373.

The comparison of cooperation with intergroup competition and interpersonal competition tends to favor cooperation. The voting-method score was 3 to 0 with 5 no differences; the effect size was .55, indicating that the average cross-handicap liking in the cooperation conditions was equivalent to the cross-handicap liking at the 71st percentile in the competition condition; and the z-score was 1.97 ($p < .025$). The fail-safe n is 1.

When cooperative and individualistic conditions were compared, the results favored cooperation by a voting-method score of 30 to 0 with 6 no differences; an effect-size of .96, indicating that the average cross-handicap liking in the cooperative condition was equivalent to the cross-handicap liking at the 83rd percentile in the individualistic condition; and a z-score of 15.39 ($p < .0001$). The fail-safe n is 2,856.

The comparison between cooperation with intergroup competition and individualistic efforts favored cooperation by a voting-method score of

3 to 0 with 1 no difference, an effect-size of .82, indicating that the average cross-handicap liking in the cooperative conditions was equivalent to the 79th percentile in the individualistic condition; and a z-score of 5.87 ($p < .0001$). The fail-safe n is 47.

Finally, the comparison between interpersonal competition and individualistic efforts favors competition by a voting-method scores of 1 to 0 with 5 no differences; an effect-size of .27, indicating that the average cross-handicap liking in the competition conditions was equivalent to the cross-handicap liking at the 61st percentile in the individualistic condition; and a z-score of 2.41 ($p < .01$). The fail-safe n is 6.

Homogeneous Relationships

Forty-eight studies comparing the relation of two or more goal structures on interpersonal attraction between homogeneous subject populations (in terms of ethnic membership and handicap status) were found and reviewed. These studies yielded 65 findings. The results appear in Table 3.

Insert Table 3 About Here

When cooperation with and without intergroup competition were compared, the results favored cooperation without intergroup competition by a voting-method score of 14 ot 3 with 2 no differences; an effect size of 1.0, indicating that the average interpersonal attraction in the cooperation without intergroup competition was equivalent to the interpersonal attraction at the 86th percentile in the cooperation with intergroup competition condition; and a z-score of 9.06 ($p < .0001$). The fail-safe n is 419.

The comparison between cooperation and interpersonal competition favored cooperation by a voting-method score of 39 to 0 with 3 no differences, an

effects size of 1.05, indicating that the average liking among subjects in the cooperative condition was equivalent to the liking at the 85th percentile in the competitive condition; and a z-score of 17.51 ($p < .0001$). The fail-safe n was 3,513.

When cooperation with intergroup competition was compared with interpersonal competition, the results tend to favor cooperation. The voting-method score was 4 to 0 with 7 no differences; the effect-size was .86, indicating that the average liking among subjects in the cooperative condition was equivalent to the liking at the 81st percentile in the competitive condition; and the z-score was 7.87, ($p < .0001$). The fail-safe n was 241.

The comparison between cooperation and individualistic efforts favored cooperation by a voting-method score of 17 to 2 with 1 no difference; an effect-size of 1.28, indicating that the average liking among subjects in the cooperative conditions was equivalent to the 90th percentile of liking in the individualistic condition; and a z-score of 12.35 ($p < .0001$). The fail-safe n was 775.

When cooperation with intergroup competition was compared with individualistic efforts, the results tended to favor cooperation. The voting-method score was 7 to 3 with no differences; the effect-size was .71, indicating that the average liking among subjects in the cooperative condition was at the 76th percentile of the individualistic condition; and the z-score was 6.16 ($p < .0001$). The fail-safe n was 104.

Finally, when interpersonal competition was compared with individualistic efforts, the results were generally equivocal. The voting-method score was 0 to 0 with 9 no differences, the effect-size was -.06, and the z-score was 1.23. The fail-safe n was 0.

Total Findings: Unweighted

Since the cross-ethnic, mainstreaming, and homogeneous findings were not significantly different from each other, they were added together to present an overall picture of the relative impact of the goal structures on interpersonal attraction. Since six of the studies reviewed had both cross-ethnic and mainstreaming data, they were counted only once in the summary of the total findings. The data in Table 4, therefore, is not a direct sum of all the data in Tables 1, 2, and 3. Overall, there were 95 different studies yielding 233 findings.

Insert Table 4 About Here

When cooperation with and without intergroup competition are compared, the results favor cooperation without intergroup competition by a score of 14 to 3 with 3 no differences, an effect-size of 1.10, indicating that the interpersonal attraction at the 50th percentile in the cooperation without intergroup competition condition is at the same level as the interpersonal attraction at the 86th percentile in the cooperation with intergroup competition condition, and a z-score of 8.06 ($p < .0001$). The fail-safe n was 419.

The comparison between cooperation and interpersonal competition favors cooperation by a voting-method score of 72 to 1 with 29 no differences, an effect-size of .77, indicating that the average interpersonal attraction in the cooperative condition is equivalent to the interpersonal attraction at the 78th percentile in the competition condition, and a z-score of 20.09 ($p < .0001$). The fail-safe n was 11,408.

When cooperation with intergroup competition was compared with interpersonal competition, the results favored cooperation by a voting-method

score of 23 to 0 with 19 no differences, an effect-size of .57, indicating that the average interpersonal attraction among subjects in the cooperative condition was equivalent to the interpersonal attraction at the 72nd percentile in the competitive condition, and a z-score of 12.17 ($p < .0001$). The fail-safe n was 1,611.

The comparison between cooperative and individualistic conditions favored cooperation by a voting-method score of 65 to 2 with 12 no differences; the effect-size was .97, indicating that the average interpersonal attraction in the cooperative conditions was equivalent to the interpersonal attraction at the 83rd percentile in the individualistic condition, and a z-score of 20.99 ($p < .0001$). The fail-safe n was 10,028.

When cooperation with group competition was compared with individualistic efforts, the results tended to favor cooperation. The voting-method score was 13 to 3 with 20 no differences; the effect-size was .72, indicating that the liking among subjects at the 50th percentile in the cooperative condition was at the same level as the liking at the 76th percentile in the individualistic condition, and the z-score was 9.93 ($p < .0001$). The fail-safe n was 531.

Finally, the results of the comparision between interpersonal competition and individualistic conditions seemed to slightly favor competition. The voting-method score was 4 to 1 with 15 no differences; the effect size was .14, indicating that the average interpersonal attraction in the competition condition was equivalent to the interpersonal attraction at the 56th percentile in the individualistic condition, and the z-score was 2.56 ($p < .01$). The fail-safe n was 20.

Total Findings: Weighted

When the number of findings are analyzed studies that have numerous findings end up having more weight than do studies with only one measure of

interpersonal attraction. In order to control for a possible bias resulting from studies with multiple measures of interpersonal attraction, the effect-size and z-score findings were reanalyzed so that each finding was weighted inversely proportionally to the number of findings from that study. This resulted in each study being given the same overall weight in the analyses. The results appear in Table 5.

Insert Table 5 About Here

The comparison between cooperation with and without intergroup competition favors cooperation without intergroup competition by an effect-size of .88 (indicating that the average liking among subjects in the cooperation without condition is equivalent to the liking at the 81st percentile in the cooperation with intergroup competition condition) and a z-score of 4.79 ($p < .0001$; fail-safe n of 52).

When cooperation is compared with interpersonal competition, the results favor cooperation by an effect-size of 1.11 (indicating that the liking among subjects at the 50th percentile in the cooperative condition was at the same strength as the liking among subjects at the 87th percentile in the competitive condition) and a z-score of 17.48 ($p < .0001$; fail-safe n of 4,251).

The comparison between cooperation with intergroup competition and interpersonal competition favored cooperation by an effect-size of .55 (indicating that the average liking among subjects in the cooperative condition was equivalent to the liking at the 71st percentile in the competitive condition) and a z-score of 6.38 ($p < .0001$; fail-safe n of 141).

When cooperation was compared with individualistic efforts the results favored cooperation by an effect-size of 1.11 (indicating that the liking among subjects at the 50th percentile in the cooperative conditions was as

strong as the liking at the 87th percentile in the individualistic condition) and a z-score of 15.74 ($p < .0001$; fail-safe n of 2,536).

The comparison between cooperation with intergroup competition and individualistic efforts favored cooperation by an effect-size of .79 (indicating that the average liking among subjects in the cooperative condition was equivalent to the liking at the 79th percentile in the individualistic condition) and a z-score of 7.36 ($p < .0001$; fail-safe n of 190).

Finally, when interpersonal competition was compared with individualistic efforts, the results slightly favored competition, and an effect-size of .11 and a z-score of 1.43 ($p < .10$).

Least Squares Estimates of Effect Sizes

The reported effect-sizes are based on comparisions of the various goal structures, which are not independent and which therefore contain redundant information. The redundancy can be reduced by treating the effect-size contrasts as essentially a linear model and solving for least squares estimates of the effects. By solving simultaneous equations generated from the goal structure contrasts, estimates of the effects of each of the goal structures relative to all other goal structures can be obtained for the effect sizes. These contrasts were solved by arbitrarily setting the individualistic goal structure to zero (we alternatively could have forced the constrasts to sum to zero). The resulting effect-sizes for the other goal structures appear in Table 6. These results indicate that cooperation without intergroup competition promotes considerably more interpersonal attraction than do cooperation with intergroup competition, interpersonal competition, or individualistic efforts. Cooperation with intergroup competition tends to promote higher liking among subjects than do interpersonal competition or individualistic

efforts. Finally, there is relatively little difference in the amount of liking promoted by the competitive and individualistic conditions.

Insert Table 6 About Here

Conclusions

The major conclusions that may be drawn from the above meta-analyses are as follows:

1. Cooperative experiences promote more positive relationships among individuals from different ethnic backgrounds, between handicapped and nonhandicapped individuals, and more homogeneous individuals than do cooperation with intergroup competition, interpersonal competition, and individualistic experiences.
2. Cooperation with intergroup competition tends to promote more positive relationships across ethnic and handicap lines and among homogeneous individuals than do interpersonal competition or individualistic experiences.
3. There seems to be little difference between the impact of interpersonal competition and individualistic efforts on interpersonal attraction.

Mediating or Moderating Variables

Another set of analyses were conducted to determine whether a number of variables mediated or moderated the meta-analyses findings. Preliminary analyses were conducted to determine which of the variables believed to be mediating or moderating were in fact related to the interpersonal attrac-

tion outcomes. Preliminary analyses were of two types. Categorical subject characteristics and subject characteristics whose relation with the dependent variables might well be nonlinear were analyzed by one-way ANOVA's. The significant ANOVA's are discussed in the text. Continuous and dichotomous study characteristics were correlated with the dependent variables. The results of the preliminary correlational analyses appear in Table 7. Omitted from Table 7 is sex, because greater than 90 percent of the findings were pooled across males and females.

The results for the independent variables for the ANOVA's, with an explanation of any recoding of categories in parentheses are as follows:

1. Grade level (age) of subjects (elementary, secondary, higher education and adult). Cooperation promotes greater interpersonal attraction in elementary schools and colleges than it does in secondary schools, for voting-method, $F(2,93) = 4.91$, $p < .01$, for z-scores, $F(2,74) = 7.69$, $p < .001$. Cooperation with intergroup competition promotes greater interpersonal attraction as subjects become older, for z-scores, $F(2,27) = 3.38$, $p < .05$. Cooperation promotes greater interpersonal attraction in secondary and elementary schools than in colleges, for effect-sizes, $F(2,23) = 8.86$, $p < .01$.

2. Year Study Was Published (prior to 1965, 1966-1975, 1976-1979, 1980-1981). Cooperation promotes greater interpersonal attraction than does competition in studies conducted before 1965 than in studies conducted after 1965, effect-size $F(3,67) = 2.88$, $p < .05$, z-score $F(3,73) = 5.51$, $p < .01$.

3. Size of Group (2, 3, 4, 5, 6+). Cooperation promotes greater interpersonal attraction than does competition in small and large groups

than in moderate size groups, voting-method $F(4,79) = 4.60$, $p < .01$, effect-size $F(4,59) = 3.11$, $p < .05$, and z-score $F((4,65) = 5.92$, $p < .01$.

4. Setting of Study (laboratory, field with random assignment, intact classes). Cooperation promotes greater interpersonal attraction than does competition in laboratory than in field studies, voting-method $F(2,92) = 5.35$, $p < .01$, z-score $F(2,73) = 8.63$, $p < .01$

5. Subject Area (language arts, math, social studies, psychology, physical education, other). Cooperation promotes higher interpersonal attraction than does competition more so in math, psychology, phsycial education, and other than in language arts and social studies, voting-method $F(5,82) = 6.14$, $p < .01$, effect-size $F(5,59) = 3.10$, $p < .05$, z-score $F(5,65) = 2.94$, $p < .05$.

6. Type of Task (other, concept attainment, verbal problem solving, motor, analytical problem solving). Cooperation promotes greater interpersonal attraction than does competition more so when the task is other than a concept attainment task, voting-method $F(4,82) = 9.66$, $p < .01$, effect-size $F(4,61) = 2.90$, $p < .05$. A similar finding is found when cooperation with group competition is contrasted with interpersonal competition, voting-method $F(2,35), = 4.01$, $p < .05$, z-score $F(2,24) = 3.49$, $p < .05$.

7. Response Type (disjunctive, other, additive). Cooperation promotes higher interpersonal attraction than does competition when the task is other or additive than when it is disjunctive, z-score $F(2,64)$, 6.09, $p < .01$.

8. Quality of Journal (best, good, fair, unpublished; ratings were taken from Koulack and Keselman, 1975, and merged into four categories). Cooperation promotes higher interpersonal attraction than does competition

more so when the article is published in the best and good journals than in the average journals and unpublished sources, for voting-method $F(3,98) = 3.84$, $p < .05$.

9. Type of Reward (feedback, symbolic, tangible). Cooperation is more superior to competition in promoting interpersonal attraction when the rewards are tangible than when they are symbolic or consist only of feedback; voting-method $F(2,91) = 5.90$, $p < .01$, effect-size $F(2,67) = 6.32$, $p < .01$, z-score $F(2,73) = 6.97$, $p < .01$. Cooperation is more superior to individualistic efforts when the rewards are symbolic or tangible than simply feedback; voting-method $F(2,73) = 3.56$, $p < .05$.

10. Ethnic Membership (homogeneous, black-white, white-other). Cooperation is most superior to competition in promoting interpersonal attraction in homogeneous samples, next in black-white samples, and least in white-other samples, voting-method $F(2,85) = 12.61$, $p < .01$, effect-size $F(2,62) = 9.30$, $p < .01$, z-score $F(2,68) = 13.09$, $p < .01$. Cooperation is most superior to individualistic efforts in promoting interpersonal attraction in homogeneous samples, next in white-other samples, and least in black-white samples, effect-size $F(2,41) = 3.51$, $p < .01$.

11. Study Category (cross-ethnic, homogeneous, mainstreaming). Cooperation is more superior to competition in promoting interpersonal attraction in homogeneous studies than in cross-ethnic or mainstreaming studies, voting-method $F(2,99) = 10.33$, $p < .01$, effect-size $F(2,68) = 5.85$, $p < .01$, z-score $F(2,74) = 14.09$, $p < .01$.

12. Authors. Cooperation is less superior to competition in the studies by Weigel and his associates compared with the findings of the other authors who have numerous findings included in the analyses, voting-method $F(3,98) =$

7.36, $p < .01$, effect-size $F(3,73) = 3.48$, $p < .05$, z-score $F(2,74) = 14.09$, $p < .01$.

The correlational data were coded so that a positive result on the dependent variable favored the first of the pair of goal structures contrasted. The correlational results are found in Table 7.

Insert Table 7 About Here

Table 8 contains a description of the variables included in the multivariate analysis. The criterion for inclusion was fairly liberal; any variable that was significantly related to any one of the three dependent variables for each contrast, with a correlation over .20, was included.

Because many of the study characteristics are highly interrelated, the findings of the regression analyses may be unstable. In addition, in such situations, sampling fluctuations in correlations can greatly change the findings. Thus the regression analyses should be viewed as augmenting information provided by the correlations, primarily by suggesting the variables most likely to exert strong influence or independent influence or both on outcomes.

To determine significant predictors, stepwise multiple regression was used. The analyses are reported for all significant predictors. The results of the multivariate analyses follow.

Insert Table 8 About Here

Cooperation with and without intergroup competition. For the voting-method, task interdependence, on-task interaction, or optimizing tasks $\beta = .62$,

$F(1,9) = 5.61$, $p < .05$, account for 38 percent of the variance. For effect-sizes, task interdependence and on-task interaction, $\beta = .87$, $p < .01$, account for 76 percent of the variance. For the z-scores, duration of study, $\beta = -.71$, $p < .01$, and task-interdependence, $\beta = .39$, $p < .05$, account for 95 percent of the variance. The superiority of cooperation without intergroup competition is greater when task interdependence, on-task interaction, and optimizing tasks are included in the studies.

Cooperation versus interpersonal competition. For the voting-method, duration of the study, $\beta = -.25$, $p < .05$, account for 35 percent of the variance. For the effect-sizes, sample size, $\beta = -.44$, $p < .01$, and task interdependence, $\beta = -.41$, $p < .01$, and the maximizing/optimizing nature of the task, $\beta = -.49$, $p < .01$, account for 50 percent of the variance.

Cooperation with intergroup competition versus interpersonal competition. For the voting-method, means interdependence, $\beta = -.40$, $p < .05$, accounts for 16 percent of the variance. For the z-scores, the divisible/unitary nature of the task, $\beta = .57$, $p < .01$, accounts for 32 percent of the variance.

Cooperation versus individualistic efforts. For the voting-method, on-task interaction, $\beta = -.56$, $p < .01$, accounts for 31 percent of the variance. For the effect-sizes, sample size, $\beta = -.30$, $p < .05$, and means interdependence, $\beta = .37$, $p < .05$, account for 28 percent of the variance. For the z-scores, sample size, $\beta = -.31$, $p < .05$ and means interdependence, $\beta = -.31$, $p < .05$, account for 21 percent of the variance. The superiority of cooperation is greater in studies with smaller sample sizes and where means interdependence exists in the cooperative condition.

Cooperation with intergroup competition versus individualistic efforts. For the voting-method, type of task, $\beta = -.29$, $p < .05$, and task interdependence $\beta = -.67$, $p < .01$, account for 68 percent of the variance. For the effect-sizes, group size, $\beta = .86$, $p < .01$, and cognitive group composition, $\beta = .29$, $p < .01$, account for 97 percent of the variance. For the z-scores, task interdependence, $\beta = -.86$, $p < .01$, accounts for 73 percent of the variance. The superiority of cooperation with intergroup competition over individualistic efforts tends to be greater the less task interdependence is included in the cooperative condition.

While these results are not as consistent as the authors would like in order to make definitive statements concerning the variables that may mediate or moderate the relationship between interpersonal attraction and the goal structures, they do provide leads for future research.

Other Relevant Studies

In addition to the studies that compared the relative efficacy of cooperative, competitive, and individualistic goal structures on cross-ethnic, cross-handicap, and homogeneous relationships, there are a number of other studies that are relevant to this review. They include studies that compare two or more cooperative conditions, studies focusing on cooperation and self-esteem, studies that focus on cooperation and perspective-taking ability, studies that focus on cooperation and cross-ethnic helping, studies that focus on cooperation and group success or group failure, and studies focusing on intergroup competition and interpersonal attraction. Each of these variables are discussed below.

Studies That Contain Only A Cooperative Condition

There are a number of studies indicating that cooperative interaction leads to positive cross-ethnic relationships or to reductions of prejudice (Diab, 1970, Foley, 1976, Katz, 1955; Mann, 1959; Burnstein & McRae, 1962). There are a number of studies with homogeneous populations indicating that cooperative interaction leads to increased interpersonal attraction (Forsyth & Kolenda, 1966; Shellhaas, 1969). There is also evidence that cooperative interaction leads to positive relationships between handicapped and nonhandicapped children (Shellhaas, 1969).

Self-Esteem

An early study by Trent (1957) showed that self-esteem and prejudice were related. The notion was advanced that one is unlikely to be accepting of others if one does not accept oneself. In a series of studies, Stephan and Rosenfield (1978a, 1979) demonstrated that self-esteem and prejudice were related. In a subsequent study (Stephan & Rosenfield, 1978b) they found that increases in self-esteem were associated with decreases in prejudice. It becomes of interest, therefore, how the various goal structures affect self-esteem of students. There is correlational evidence that cooperativeness is positively related to self-esteem in students through elementary, junior, and senior high school in rural, urban, and suburban settings; competitiveness is generally unrelated to self-esteem; and individualistic attitudes tend to be related to feelings of worthlessness and self-rejection (Gunderson & Johnson, 1980; Johnson & Ahlgren, 1976; Johnson, Johnson & Anderson, 1978; Johnson & Norem-Hebeisen, 1977; Norem-Hebeisen & Johnson, 1981). There is experimental evidence indicating that cooperative learning experiences, compared with individualistic and competitive ones, result in higher self-

esteem (Blaney, Stephan, Rosenfield, Aronson, & Sikes, 1977; Geffner, Note 7; Johnson, Johnson, & Scott, 1978; R. Johnson & Johnson, 1981; Smith, Johnson, & Johnson, 1982; Nevin, Johnson, Johnson, & Johnson, 1982).

In a series of studies with suburban junior and senior high school students, Norem-Hebeisen and Johnson (1981) examined the relationships among cooperative, competitive, and individualistic attitudes and ways of conceptualizing one's worth from the information that is available about oneself. Four primary ways of deriving self-esteem are: (a) basic self-acceptance (a belief in the intrinsic acceptability of oneself); (b) conditional self-acceptance (acceptance contingent on meeting external standards and expectations); (c) self-evaluation (one's estimate of how one compares with one's peers); and (d) real-ideal congruence (correspondence between what one thinks one is and what one thinks one should be). Attitudes toward cooperation were found to be related to basic self-acceptance and positive self-evaluation compared to peers, whereas attitudes toward competition were found to be related to conditional self-acceptance, and individualistic attitudes were found to be related to basic self rejection.

Perspective-Taking

A potentially important influence on the building of constructive cross-ethnic relationships is the ability of both majority and minority students to take each other's perspectives. Social perspective-taking is the ability to understand how a situation appears to another person and how that person is reacting cognitively and emotionally to the situation. The opposite of perspective-taking is egocentrism, the embeddedness in one's own viewpoint to the extent that one is unaware of other points of view and of the limitations of one's perspective. A number of studies have found that cooperativeness is

positively related to the ability to take the emotional perspective of others (Johnson, 1975a, 1975b; Murphy, 1937). Contrarily, Levine and Hoffman (1975) found no relationship. Cooperative learning experiences, furthermore, have been found to promote greater cognitive and emotional perspective-taking abilities than either competitive or individualistic learning experiences (Bridgeman, Note 8; Johnson, Johnson, Johnson, & Anderson, 1976; R. Johnson & Johnson, 1981; Lowry & Johnson, 1981; Smith, Johnson, & Johnson, 1981; Tjosvold & Johnson, 1978). Competitiveness, furthermore, has been found to be related to egocentrism (Barnett, Matthews, & Howard, 1979).

Cross-Ethnic Helping

A number of studies on desegregation have noted that there is more cross-ethnic helping in cooperative than in competitive or individualistic learning situations (Johnson & Johnson, 1975, 1978; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981). Since such helping seems more like a condition check for cooperation than a dependent variable, these findings have not been included in this article. Blanchard and Cook (1976) note, however, that the negative effects of lower levels of competence on the development of respect and liking might be offset if a prejudiced individual were to help a less competent minority group member in performing his part of a group task. They predicted that such helping would provide a source of satisfaction with the group experience and would generalize to the less competent recipient of help. Their results confirm this hypothesis. Students expressed significantly greater satisfaction with the group experience and greater attraction for a less competent group member when they were induced to help him than when help was provided by another group member; this effect held for both white and black recipients of help. Mumpower and Cook (1977), however, found no difference in interpersonal

attraction resulting from the giving of help to less competent group members. Cook and Pelfrey (Note 9) also failed to replicate the effect. The experience of personally helping a less competent group mates with their part of the group task neither increased nor decreased respect and liking for them by comparison with the experience of observing a second teammate provide such help. Such results might be explained through Deutsch's (1949, 1962) notion of substitutability--the behavior of the helper substituted for one's own giving of help, thus causing satisfaction and liking to be the same in both instances.

A number of other investigators have found more frequent cross-ethnic helping and tutoring within cooperative than within competitive or individualistic learning situations (Weigel, Wiser, & Cook, 1975; DeVries & Edwards, Note10; DeVries, Edwards, & Slavin, 1978; Slavin, 1979; Johnson & Johnson, 1981a, 1982a; Cooper, Johnson, Johnson, & Wilderson, 1980; Witte, Note 11). A related series of studies has found that there is more helping between handicapped and nonhandicapped students in cooperative than in competitive or individualistic learning situations (D. Johnson & Johnson 1982a, 1981b; Armstrong, Johnson, & Balow, 1981; Cooper, Johnson, Johnson, & Wilderson, 1980). Finally, a number of studies with homogeneous samples have found more peer helping and tutoring in cooperative than in competitive or individualistic learning situations (Hamblin, Buckholdt, Ferritor, Kozlogg, & Blackwell, 1971; Hamblin, Hathaway, & Wodarski, 1971; Wodarski, Hamblin, Buckholdt, & Ferritor, 1981, 1972, 1973, 1974; Buckholdt, Ferritor, & Tucker, Note12; DeVries & Edwards Note10; DeVries, Edwards, & Wells, 1974; DeVries & Mescon, 1975).

There are other studies that examine the reactions to helping behavior from the perspective of the helper and the helpee separately. One study indicates that helpers are liked more than are nonhelpers (Fisher & Nadler, 1974). On the other hand, disabled individuals (Ladieu, Hanfman, &

Dembo, 1947) and individuals undergoing rehabilitation (Alger & Rusk, 1955) have been reported to resent help and to take offense at the helper. Similar findings have been found in studies with the elderly (Lipman & Sterne, 1962), of the poor on welfare (Briar, 1966; Haggstrom, 1964), and of residents of nations who are the recipients of foreign aid (Gergen & Gergen, 1971). Reactance theory would predict that negative feelings toward being helped would be greatest when the help is externally imposed (Broll, Gross, & Piliavin, 1974).

Reciprocation of help seems to be important in promoting positive interpersonal relationships. Recipients who are unable to reciprocate (Gross & Latane, 1974) or anticipate being unable to reciprocate (Greenberg & Shapiro, 1971) or who are not told by the helper that equivalent benefits are expected from them in return (Gergen, Ellsworth, Marlack, & Seipel, 1975), like their helpers less than do those reciprocating the help or expecting to do so. A donor of help who is a peer and is therefore similar to the recipient is liked less than a dissimilar helper (Fisher & Nadler, 1974).

Volunteered help of the sort that characterizes cooperative learning situations has been found to elicit more liking of the helper than does involuntary helping (Gross & Latane, 1974; Broll, Gross, & Piliavin, 1974). Help from an ally--as in the case of another group member--leads to a positive shift in feelings for the helper, whereas help from an opponent does not (Nadler, Fisher, & Streufert, 1974). Somewhat contrary to this finding, when aid is expected in advance, as if is from an ally, its arrival does not increase favorable perceptions of the donor (Morse & Gergen, 1971;

Morse, 1972).

The evidence on cooperation indicates that helpers are not disliked and that giving help promotes more liking for the helpee.

Group Success Versus Group Failure

A number of researchers have suggested that success in achieving the group's goal is a crucial factor in the development of attraction among members of cooperative groups (Ashmore, 1970; Collins & Raven, 1969; Lott & Lott, 1965). Empirical research, however, has provided both supporting (Deutsch, 1949; Heber & Heber, 1957; Shelley, 1954; Stotland, 1959; Wilson & Miller, 1961; Worchel & Norvell, 1980; Zander & Havelin, 1960) and qualifying evidence (Berkowitz, Levy, & Harvey, 1957; Hoffman, 1958; Lanzetta, 1955; Streufert & Streufert, 1969; Thibaut, 1950; Zander, Stotland, & Wolfe, 1960) for this proposition.

Cook and his associates (Blanchard & Cook, 1976; Blanchard, Adleman, & Cook, 1975; Blanchard, Weigel, & Cook, 1975; Mumpower & Cook, 1978; Cook & Pelfrey, Note 9) have conducted a series of studies in which they have generally found that group success fosters the development of intermember attraction in mixed-ethnic cooperative groups. Group success leads to greater respect and liking for groupmates than did group failure. The results may only hold, however, when a reward contingent on group performance is obtained. Group success also leads to greater feelings of satisfaction than did group failure.

Stephan, Presser, Kennedy, and Aronson (1978) found that when individuals succeed at a task they tend to attribute their success to their skill, but when they fail they tend to attribute their failure to bad luck.

They went on to demonstrate that individuals engaged in an interdependent, cooperative task make the same kinds of attributions to their partner's performance as they do for their own. This was not the case in competitive interactions.

Liking for group members becomes progressively more favorable, and out-group attitudes become more unfavorable as the extent of group success increases (Kahn & Ryen, 1972). Worchel and Norvell (1980) and Worchel, Andreoli, and Folger (1977) found that attraction among cooperators increases when the efforts are successful. Failure decreases liking of group members for each other relative to either success in competition or competition where the outcome is ambiguous, owing to the absence of any win-lose feedback (Ryen & Kahn, 1975; Worchel, Lind, & Kaufman, 1975). Failure in intergroup competition has been found to reduce perceived and desired unity among group members (Zander, Stotland, & Wolfe, 1960). When environmental conditions can be blamed for the failure, however, attraction among cooperators does not decrease (Worchel & Norvell, 1980).

Competence Of Group Members

There is evidence that individuals generally like and respect competent persons more than incompetent ones (Aronson, Willerman, & Floyd, 1966; Berkowitz, Levy, & Harvey, 1957; Gilchrist, 1952; Helmreich, Aronson, & LeFan, 1970; Iverson, 1964; Shaw & Gilchrist, 1955; Stotland & Hilman, 1962). There are also a number of studies that indicate that within cooperative learning groups, competent members are liked better than incompetent ones (Blanchard, Weigel, & Cook, 1975; Cook & Pelfrey, Note 9; Mumpower & Cook, 1978; Rosenfield, Stephan & Lucker, Note 13; Rosenfield & Stephan, 1980;

Rosenfield & Roberts, Note 14; Worchel, Andreolli & Folger, 1977). Tjosvold, Johnson, and Johnson (1981), however, demonstrated that highly competent members are liked primarily when they exert effort to achieve the group's goals, and that low competence members who also exert high effort to achieve the group's goals are also liked.

Within schools, competence traditionally most often depends on reading and math ability. Since there is evidence that students who are perceived as having higher academic or reading ability dominate those who are perceived to be lower in ability (Hoffman, Note15; Stulac, Note 16; Rosenholtz, 1980), and that whites tend to be better readers than minority students (Cohen, 1975, 1980), it has been argued that equal status interaction between white and minority studies will tend not to occur in learning groups (Cohen, 1975). In fact, whites in mixed-ethnic learning groups tend to participate more frequently and exert more influence on group decisions (Cohen, 1975; Katz & Benjamin, 1960; Katz & Cohen, 1962; Katz, Goldston, & Benjamin, 1958). This does not mean, however, that minority group members will be disliked or that constructive relationships will not form between majority and minority students.

Participation In Decision-Making

Weigel and Cook (1975) argue that participation in decision-making promotes interpersonal attraction among members of cooperative groups They conducted a study that found majority and minority group members like each other better when they participated in group decision-making than when they did not. In another study (Blanchard, Adelman, & Cook, 1975), however, no effects of participation on decision-making and interpersonal

attraction were found.

Intergroup Competition

One of the basic issues concerning the use of cooperative learning procedures is the effect of intergroup competition on relationships within and outside of the group. There are a number of studies that indicate that simply placing strangers in groups induces more favorable evaluations of one's groupmates than of those in other groups (Rabbie & Hauygen, 1974; Sample & Botto, Note 17). The mere classification of strangers into groups evokes favoritism in the allocation of resources to co-members of one's own group (Tajfel, Billig, Bundy, & Flament, 1971; Billig, 1973; Tajfel & Billig, 1974). Similar findings have been found by Sole, Marton, and Hornstein (1975). Even when groups anticipate interaction with one another the evaluation of ingroup members is more favorable than when no such interaction is expected (Rabbie & Wilkins, 1971). When competition with another group is anticipated the attraction to other members of one's group is higher than when cooperation with another group is anticipated (Doise, Csepeli, Dann, Gouge, Larsen, & Ostell, 1972; Kahn & Ryen, 1972). While one's own group is preferred, there is evidence that the higher the attraction among members of one's group the higher the attraction to members of other groups (Wilson & Miller, 1961; Wilson, Chun, & Kayatana, 1965; Wilson & Kayatana, 1968; Wilson, 1971; Rabbie, Note 18).

There are a number of studies that indicate that competition between groups increases liking for ingroup members and hostility toward members of competing groups (Sherif, 1953; Sherif, Harvey, White, Hood, & Sherif, 1961; Blake & Mouton, 1961a, 1961b; Bass & Dunteman, 1963). Worchel,

Andreolli, and Folger (1977) found that members of competing groups showed greater liking for group members than did members of noncompeting groups and that members of competing groups evaluated outgroup members less favorably than did members of noncompeting groups. Dunn and Goldman (1966) also found that members of competing groups evaluated outgroup members less favorable than did members of noncompeting groups. Singer, Radloff, and Wark (1963) found increases in liking among group members after intergroup competition, but no change in ratings of outgroup members.

There are a number of studies that find lower attraction among group members after failure (Ryen & Kahn, 1975; Worchel, Lind, & Kaufman, 1975; Blanchard, Adelman, & Cook, 1975; Blanchard, Weigel, & Cook, 1975; Blanchard & Cook, 1976). As groups become increasingly successful in competition their evaluation of outgroup members progressively drops (Kahn & Ryen, 1972).

Taken together, these studies indicate that intergroup competition should promote a drop in attractiveness toward members of other groups and a rise in attraction toward one's own group members.

Instructional Interaction

One of the problems with the research on cross-ethnic relationships and goal structures is that there is very little evidence concerning the actual interaction taking place between minority and majority students during instruction. Johnson and Johnson (1981a, 1982) found that considerably more cross-ethnic interaction occurred within cooperative than in competitive or individualistic instructional situations. Cooperation promoted more on-task behavior and greater perceptions of cross-ethnic helping, peer academic support, and class cohesion (Johnson & Johnson, 1981a).

In a related series of studies on mainstreaming, R. Johnson and Johnson (1982b) found that cooperative learning experiences promoted more on-task behavior and cross-handicapped helping than did competitive learning experiences, as well as the perception that the class was more cohesive. Johnson and Johnson (1982a) found that there was more positive cross-handicapped interaction during instruction in the cooperative than in the competitive and individualistic conditions. Nevin, Johnson, and Johnson (1982) found that there was less negative interaction between handicapped and nonhandicapped students in the cooperative than in the individualistic condition. Johnson and Johnson (1982b) found more positive interaction between handicapped and nonhandicapped students (characterized by more on-task behavior, and greater perceived helping and peer academic support) in the cooperative than in the individualistic condition. Johnson, Rynders, Johnson, Schmidt, and Haider (1979) and Rynders, Johnson, Johnson, and Schmidt (1980) both found more positive interaction between handicapped and nonhandicapped students during instruction in the cooperative than in competitive and individualistic conditions. Finally, R. Johnson and Johnson (1981) used an observation instrument that would differentiate more precisely the nature of the interaction between handicapped and nonhandicapped students. They found more questions, directions and suggestions, helping and assisting, and encouraging and praising comments in the cooperative than in the individualistic condition, while hostile and rejecting comments were more frequent in the individualistic condition. There was more on-task behavior and greater perceived peer academic support in the cooperative than in the individualistic condition.

Generalization Of Interaction To Free-Time Situations

A major problem with the current research comparing the impact of the goal structures on interaction between minority and majority students during free-time subsequent to instructional interaction. Until recently there was no evidence that cross-ethnic relationships formed during instructional situations would generalize to post-instructional, free-choice situations. Johnson and Johnson (1981a) found that minority and majority students interacted more during free-time stiuations when they had been in a cooperative rather than an individualistic instructional situation. Johnson and Johnson (1982a) found that cooperative learning experiences resulted in more cross-ethnic interaction during post-instructional free-time than did either competitive or individualistic experiences.

There have also been a few studies examining the generalization of relationships formed between handicapped and nonhandicapped students during instruction to subsequent free-time situations. Martino and Johnson (1979) found more than four times as much interaction between handicapped and nonhandicapped students during post-instructional free-time in the cooperative than in the individualistic condition. R. Johnson and Johnson (1982b) found that cooperation promoted more than three times the number of free-time interactions between handicapped and nonhandicapped students than did competition. Johnson and Johnson (1981b) found that cooperation promoted more 2½ times the number of free-time interactions between handicapped and nonhandicapped students than did individualistic learning experiences. On a social-schema, figure placement task students in the cooperative condition placed three times as many handicapped and nonhandicapped students as inter-

acting during free-time than did the students in the individualistic condition. R. Johnson and Johnson (1981) found three times as many post-instructional free-time interactions in the cooperative than in the individualistic condition. R. Johnson and Johnson (1982a) found that the handicapped students were closer to their nonhandicapped peers during post-instructional free-time than they were in the competitive and individualistic conditions.

Summary

School desegregation and mainstreaming are based on the assumption that through placing heterogeneous students (in terms of ethnic membership and handicapping conditions) in the same school and classroom, positive relationships and attitudes among the students will be facilitated. A lack of theoretical models and apparently inconsistent research findings have left the impression that desegregation and mainstreaming may not be working and may not be constructive. A key factor in determining whether desegregation and mainstreaming promote positive or negative relationships between heterogeneous students is the way in which classroom teachers structure goal interdependence among students as they work on academic assignments. By structuring positive, negative, or no goal interdependence among heterogeneous students during academic learning situations, teachers can influence the pattern of interaction and the interpersonal attraction that develops among them. While the preinteraction influences (stigmatization, impression formation, labeling, and categorization) promote negative attitudes among heterogeneous students, it is the conditions under which they interact within the classroom that determine whether the negative attitudes are strengthened or positive attitudes develop. Interaction within a cooperative context promotes a process of acceptance and inter-

action within a competitive or individualistic context promotes a process of rejection.

To determine whether the theoretical model is valid and to resolve some of the confusion in the literature on desegregation and mainstreaming, the available research is reviewed on the impact of the effect of the goal structures on interpersonal attraction among heterogeneous and homogeneous students. All available studies were included in the review and three types of meta-analysis procesures: voting-method, effect-size, and z-score. The results indicate cooperation without intergroup competition promotes greater interpersonal attraction than do interpersonal competitive, individualistic instruction, or cooperation with intergroup competition. ANOVA and correlational analyses were conducted to determine whether potentially moderating or mediating variables were related to the interpersonal attraction outcomes for all studies combined. A stepwise multivariate regression analysis was then conducted. The results provide some promising leads for future research.

There are a number of other variables that, while they do not compare two or more of the goal structures, or do not include interpersonal attraction as a dependent variable, deal with variables that have been hypothesized to mediate the relationship between cooperation and interpersonal attraction. Self-esteem, perspective-taking, helping, group success, competence of group members, and participation in decision-making should increase cross-ethnic friendships and positive attitudes. The presence of intergroup competition has been found to increase the attraction among members of the same group, but decrease the attraction among members of different groups, effects that may neutralize each other in the desegregated or mainstreamed classroom. While these variables are promising, considerable more research needs to be

conducted before the variables that mediate the relationships between cooperation and interpersonal attraction can be confidently identified.

Most of the research on cross-ethnic relationships has used paper and pencil measures of interpersonal attraction. There is very little evidence concerning the nature of the actual interaction taking place between minority and majority students during instruction and concerning whether the relationships established during instruction generalize to post-instructional, free-time situations. Recent research provides some evidence that cooperation leads to positive interaction among heterogeneous students both during instruction and in post-instructional free-time situations.

Table 1

Meta-Analysis of Cross-Ethnic Findings

	Voting			Effect Size			z-score		
	N	ND	P	M	SD	N	z	N	Fail-safe z
Cooperative vs. Group Competitive	0	1	0	--	--	--	--	--	--
Cooperative vs. Competitive	1	24	29	0.54	0.50	42	10.33	42	1,617
Group Competitive vs. Competitive	0	11	18	0.40	0.13	7	9.15	17	509
Cooperative vs. Individualistic	0	5	19	0.68	0.41	17	10.08	19	695
Group Competitive vs. Individual-istic	0	1	3	0.60	0.18	2	5.36	3	29
Competitive vs. Individualistic	1	2	4	0.21	0.71	7	3.05	7	17

NOTE: A positive finding favors the first goal structure of each pair, a negative finding favors the second goal structure of each pair.

Table 2

Meta-Analyses of Mainstreaming Findings

	Voting			Effect Size			z-score		
	N	ND	P	M	SD	N	z	N	Fail-safe n
Cooperative vs. Group Competitive	0	0	0	--	--	--	--	--	--
Cooperative vs. Competitive	0	9	14	0.86	0.54	16	7.88	17	373
Group Competitive vs. Competitive	0	5	3	0.41	0.55	2	1.97	2	1
Cooperative vs. Individualistic	0	6	30	0.96	0.55	30	15.39	33	2,856
Group Competitive vs. Individualistic	0	1	3	0.82	0.15	3	5.87	4	47
Competitive vs. Individualistic	0	5	1	0.27	0.63	5	2.41	5	6

Table 3

Meta-Analyses of Homogeneous Findings

	Voting			Effect Size			z-score		
	N	ND	P	M	SD	N	z	N	Fail-safe n
Cooperative vs. Group Competitive	3	2	14	1.10	1.98	12	8.06	15	419
Cooperative vs. Competitive	0	3	39	1.05	0.76	25	17.51	30	3,513
Group Competitive vs. Competitive	0	7	4	0.86	1.00	5	7.87	11	241
Cooperative vs. Individualistic	2	1	17	1.28	1.51	13	12.35	14	775
Group Competitive vs. Individual-istic	3	8	7	0.71	2.46	6	6.16	8	104
Competitive vs. Individualistic	0	9	0	-0.06	0.17	5	-0.23	4	—

Table 4

Meta-Analyses of Total Findings[a]

	Voting			Effect Size			z-score		
	N	ND	P	M	SD	N	z	N	Fail-safe n
Cooperative vs. Group Competitive	3	3	14	1.10	1.98	12	8.06	16	419
Cooperative vs. Competitive	1	29	72	0.77	0.66	71	20.09	77	11,408
Group Competitive vs. Competitive	0	19	23	0.57	0.62	14	12.17	30	1,611
Cooperative vs. Individualistic	2	12	65	0.97	0.87	6	20.94	62	10,028
Group Competitive vs. Individual-istic	3	10	13	0.72	1.75	11	9.93	15	531
Competitive vs. Individualistic	1	15	4	0.14	0.52	5	2.56	14	20

[a]Several studies contained both cross-ethnic data and mainstreaming data. They were included in both the cross-ethnic and mainstreaming analyses. When conducting the meta-analyses for the total findings, however, they were included only once and, therefore, there are non-summings n's in this table.

Table 5

Meta-Analyses of Weighted Total Findings

	Effect-Size		z-score		
	M	N	z	N	Fail-Safe n
Cooperative vs. Group Competitive	.88	6	4.79	7	52
Cooperative vs. Competitive	1.11	37	17.48	38	4,251
Group Competitive vs. Competitive	.55	5	6.38	10	141
Cooperative vs. Individualistic	1.11	25	15.74	28	2,536
Group Competitive vs. Individualistic	.79	8	7.36	10	190
Competitive vs. Individualistic	.11	9	1.43	8	0

Table 6

Least Squares Estimates of Effect-Sizes

	Cross-Ethnic	Mainstreaming	Homogeneous	Total Unweighted	Total Weighted
Cooperation	.80	1.17	1.34	1.17	1.28
Cooperation with Intergroup Competition	.69	.88	.48	.51	.62
Interpersonal Competition	.38	.53	.11	.16	.12
Individualistic	0	0	0	0	0

Table 7

	CO vs CGC			CO vs CM			CGC vs CM			CO vs IND			CGC vs IND			CM vs INC		
	Voting	Effect	z	Voting	Effect	z	Voting	Effect	z	Voting	Effect	z	Voting	Effect	z	Voting	Effect	z
Sample Size	(13)	(10)	(16)	(102)	(71)	(77)	(27)		(30)	(74)	(56)	(66)	(26)	(11)	(13)			
Rater					-34**	-26*						28*						
Year of Study						-27*												
Sample Size					-38**	-25*					61**	35**						
Size of Groups						-28*					53**			95**				
Type of Setting				-30**	-26**	-42*							42*					
Duration			-92**	-39**	-37**	-37**												
Grade	-61*								45*									
Subject Area																		
Type of Task				56**	34**	29**			47*				-47*					
Type of Reward				28**	38**	39**					28**			-86**				
Resource Sharing (C)			82*		-35*	-30*				-40*			-48*					
(M)						-35*												
(I)											-84**							
Baseline																		
Task Interdependence (C)		87**								-40**			-76**	-60	-84**			
(M)			61*		-40**	-41**												
(I)											-81**							
Baseline	68**		82**															
Means Independence (C)					31*	30*					34*	33*	-57*					
(M)					-42**		-40*											
(I)																		
Baseline																		
On-Task Interaction (C)		87**			25*	26*				-32**		29*	-76**					
(M)			63*			-30*												
(I)											-82**							
Baseline			79*															
Cognitive Rehersal (C)			89*							-39**			-59**	-98**	-87**			
(M)																		
(I)																		
Baseline																		
Peer Tutoring (C)										-30*								
(M)																		
(I)																		
Baseline																		
Peer Encouragement (C)																		
(M)																		
(I)																		
Baseline																		
Racial Group Composition				-39**	-42**	-51**												
Racial Differentiation				-33**	-42**	-51**					-35*							
Cognitive Group Composition						-47**					-35*							
Cognitive Differentiation				-30*		-51**							67**		59*			
Divisible/Unitary					34**	35**			59*									
Maximizing/Optimizing	-67*		-70**		-40**	-45**												
Response Type					30*	38**				26*	-38**		55**					
Ability Group Composition				-31*		-39*												
Sex Group Composition				-29**	-39**	-47**												
Study Category				40**	32**	52**							56**		74**			
Author				-40**	-36**	-34**												
Journal				-30**		-26**												

Table 7
Correlations

Sample Size	CO vs CGC			CO vs CH			CGC vs CM			CGC vs IND			CM vs IND		
	Voting (13)	Effect (10)	g (16)	Voting (102)	Effect (71)	g (77)	Voting (27)	Effect –	g (30)	Voting (74)	Effect (56)	g (66)	Voting (26)	Effect (11)	g (13)
Year of Study	–	–	–	–	–	-27*	–	–	–	–	–	–	–	–	–
Sample Size	–	–	–	–	-38**	-25*	–	–	–	–	61**	35**	–	–	–
Group Size	–	–	–	–	–	-28*	–	–	–	–	53**	–	–	95**	–
Type of Setting (Lab vs other)	–	–	–	-30**	-26**	-42*	–	–	–	–	–	–	42*	–	–
Duration of Study	–	–	-92**	-39**	-37**	-37**	–	–	–	–	–	–	–	–	–
Grade Level	-61*	–	–	–	–	–	–	–	45*	–	–	–	–	–	–
Type of Task (concept attain vs other)	–	–	–	56**	34**	29**	–	–	47*	–	–	–	-47*	–	–
Type of Reward (Other vs tangible)	–	–	–	28**	38**	39**	–	–	–	–	28**	–	–	-86**	–
Task Interdependence (C)	–	87**	–	–	–	–	–	–	–	-40**	–	–	-76**	-60	-84**
(M)	–	–	61*	–	-40**	-41**	–	–	–	–	-81**	–	–	–	–
(I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(B)	68**	–	82**	–	–	–	–	–	–	–	34*	33*	-57*	–	–
Means Independence (C)	–	–	–	–	31*	30*	–	–	–	–	–	–	–	–	–
(M)	–	–	–	–	-42**	–	-40*	–	–	–	–	–	–	–	–
(I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(B)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
On-Task Interaction (C)	–	–	87**	–	25*	26*	–	–	–	-32**	–	29*	-76**	–	–
(M)	–	–	63*	–	–	-30*	–	–	–	–	-82**	–	–	–	–
(I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(B)	–	–	79*	–	–	–	–	–	–	–	–	–	–	–	–
Resource Sharing (C)	–	–	82*	–	-35*	-30*	–	–	–	-40*	–	–	-48*	–	–
(M)	–	–	–	–	–	-35*	–	–	–	–	-84**	–	–	–	–
(I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(B)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Peer Tutoring (C)	–	–	–	–	–	–	–	–	–	-30*	–	–	–	–	–
(M)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(B)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Racial Group (homogeneous vs heterogeneous)	–	–	–	-39*	-42*	-51*	–	–	–	–	-35*	–	–	–	–
Racial Differentiation (white vs other)	–	–	–	-33**	-42**	-51**	–	–	–	–	-35*	–	–	–	–
Cognitive Group Cooperative Condition (homogeneous vs heterogeneous)	–	–	–	–	–	-47**	–	–	–	–	–	–	67**	–	59*
Divisible/Unity	–	–	–	–	34**	35**	–	–	59*	–	–	–	–	–	–
Maximizing/Optimizing	-67*	–	-70**	–	-40**	-45**	–	–	–	–	26*	-38*	55**	–	–
Response Type (disjunctive vs other)	–	–	–	–	30*	38**	–	–	–	–	–	–	–	–	–
Sex Group Composition (single vs mixed)	–	–	–	-29**	-39**	-47**	–	–	–	–	–	–	56**	–	74**
Cognitive Differentiation	–	–	–	-30*	–	-51**	–	–	–	–	–	–	–	–	–
Peer Encouragement (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(M)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(B)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ability Group Composition	–	–	–	-31*	–	-35*	–	–	–	–	–	–	–	–	–
Study Category (heterogeneous vs homogeneous)	–	–	–	40**	32**	52**	–	–	–	–	–	–	–	–	–
Author (other vs Weigel)	–	–	–	-40**	-36**	-34**	–	–	–	–	–	–	–	–	–
Journal Quality	–	–	–	-30**	–	-26**	–	–	–	–	–	–	–	–	–

NOTES FROM TABLE 7:

CO = cooperation; CGC = cooperation with group competition; CM = competition; IND = individualistic.

Leading decimals have been omitted.

(C) = cooperation; (M) = competition; (I) = individualistic; (B) = baseline.

Those variables which are not continuous were all coded dichotomously. The categories described in parentheses after a variable name, was coded "1". The absence of the category described or the second category described in parentheses, was coded "2".

** = $p < .01$; * = $p < .05$.

Table 8
Regressions

	CO vs CGC			CO vs CM			CGC vs CM			CO vs IND			CGC vs IND		
	Voting (N=11)	Effect (N=10)	$\bar{x}$ (N=9)	Voting (N=54)	Effect (N=43)	$\bar{x}$ (N=47)	Voting (N=23)	Effect –	$\bar{x}$ (N=27)	Voting (N=46)	Effect (N=34)	$\bar{x}$ (N=52)	Voting (N=21)	Effect (N=10)	$\bar{x}$ (N=10)
Year of Study	–	–	–	–	–	✓	–	–	–	–	–	–	–	–	–
Sample Size	–	–	–	✓	-44**	✓	–	–	–	✓	-30[m]	31*	–	–	–
Group Size	–	–	–	–	–	✓	–	–	–	–	✓	–	–	86**	–
Type of Setting (Lab vs other)	–	–	–	✓	✓	✓	–	–	–	–	–	–	✓	–	–
Duration of Study	–	–	-71**	-65**	✓	✓	–	–	–	–	–	–	–	–	–
Grade Level	✓	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–
Type of Task (concept attain vs other)	–	–	–	✓	✓	✓	–	–	✓	–	–	–	-29*	–	–
Type of Reward (other vs tangible)	–	✓	–	✓	✓	37**	–	–	–	–	✓	–	–	✓	–
Task Interdependence (C)	–	87**[l]	–	–	–	–	–	–	–	✓	–	–	-67**	–	-86**
(M)	–	–	39*	✓	-41**	–	–	–	–	–	–	–	–	–	–
(I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(B)	62*[l]	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Means Interdependence (C)	–	–	–	–	–	–	–	–	–	✓	37**	31*	–	–	–
(M)	–	–	–	–	–	–	-40[m]	–	–	–	–	–	–	–	–
Co-Task Interaction (C)	–	87**[l]	–	✓	✓	✓	–	–	–	-56**	✓	✓	✓	–	–
(M)	–	–	–	–	–	✓	–	–	–	–	–	–	–	–	–
(B)	62*[l]	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Resource Sharing Cooperative Condition	–	–	–	–	–	–	–	–	–	✓	–	–	✓	–	–
Peer Tutoring	–	–	–	–	–	–	–	–	–	✓	–	–	–	–	–
Racial Group (homogeneous vs heterogeneous)	–	–	–	✓	✓	✓	–	–	–	–	✓	–	–	–	–
Racial Differentiation (white vs other)	–	–	–	✓	✓	✓	–	–	–	–	✓	–	–	–	–
Cognitive Group Cooperative Condition (homogeneous vs heterogeneous)	–	–	–	–	–	–	–	–	–	–	–	–	–	29**	✓
Divisible/Unitary	–	–	–	-25*	✓	✓	–	57**	–	–	–	–	–	–	–
Maximizing/Optimizing	62*[l]	–	✓	✓	✓	-49**	–	–	–	✓	✓	✓	✓	–	–
Response Type (disjunctive vs other)	–	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–
Sex Group Composition (single vs mixed)	–	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–
Study Category (heterogeneous vs homogeneous)	–	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–
Author (others vs Weigel)	–	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–
Journal Quality	–	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–
R^2	38	74	95	35	49	50	16	–	32	31	28	21	68	97	73
F	5.61*	24.87**	33.3**	13.33**	19.07**	21.98**	3.94[m]	11.81**	11.81**	11.83**	5.96**	6.45**	19.37**	118.39**	21.80**

NOTES: CO = cooperation; CGC = cooperation with group competition; CM = competition, IND = individualistic.
Leading decimals have been omitted
"✓" means the variable was included in the prediction equation but that it was non-significant.
(C) = cooperation; (M) = competition; (I) = individualistic; (B) = baseline.
For the competition versus individualistic contrasts there were no significant predictors.
[l]Predictor variables in regression analysis were perfectly correlated, so significant β can be attributed to any one of the predictors
Process variables which are not continuous were all coded dichotomously. The categories described in parentheses after a variable name, were coded "1". The absence of the category described or the second category described in parentheses, was coded "0".
** = p < .01 * = p < .05 [m] = p < .1

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Appendix

Studies Included in Meta-Analysis

Cross-Ethnic

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Appendix

Studies Included in Meta-Analysis

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Appendix

Studies Included in Meta-Analysis

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