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STUDENT ATTITUDES TOWARD COMPETITIVE, COOPERATIVE, AND INDIVIDUALISTIC CLASSROOM GOAL STRUCTURES

by

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M. A., University of Colorado, 1986

A thesis submitted to the

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Student Attitudes toward Competitive, Cooperative, and Individualistic Classroom Goal Structures

Thesis directed by Professor O. J. Harvey

This study contrasted student attitudes toward goal interdependence and social interdependence characterizations of competitive, cooperative, and individualistic goal structures in educational settings by examining their interrelationships; relationships with theoretical correlates such as helpfulness, sociability, need for social comparison, and fear of failure; and predictive abilities. College student attitudes toward competitive and cooperative goal structures were statistically unrelated as were student attitudes toward competitive and individualistic goal structures. Student attitudes toward cooperative and individualistic goal structures were significantly and negatively related.

The Social Interdependence Cooperation and Individualism Scales (Johnson & Norem-Hebeisen, 1979) were unable to predict student attitudes toward grade characterizations of goal interdependence structures, and the Social Interdependence Cooperation scale was found to be a measure of helpfulness not cooperation. The Goal Interdependence Scales predicted student ratings of grade and task interdependencies depicted in several vignettes. The relationships of competition, cooperation, and individualism with their theoretical correlates were found to depend

on how these conditions of goal interdependence were characterized, that is, as grade or task interdependencies.

Dedication

To my wife and children.

ACKNOWLEDGEMENTS

Although there were many people who helped me as I worked to complete this project, the greatest contribution to this dissertation and to my intellectual growth was made by my mentor, Dr. O. J. Harvey. Your encouragement and support enabled me to complete this project with a feeling of pride and personal accomplishment.

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CHAPTER 1

INTRODUCTION

There are hundreds of studies comparing the relative effects of competitive, cooperative, and individualistic goal structures in classroom settings (Cotton & Cook, 1982; Johnson & Johnson, 1974, 1989; Johnson, Johnson, & Maruyama, 1983; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; McGlynn, 1982; Michaels, 1977; Miller & Hamblin, 1963; Sharan, 1980, 1990; Slavin, 1980, 1990). Although most of this research effort has focused on how to implement various goal structures in order to enhance student academic achievement and to produce positive gains on other work-related outcomes, only recently has interest developed in student attitudes toward these structures as mediating variables (Johnson & Algren, 1976; Johnson & Norem-Hebeisen, 1979; Kagan, 1977; Okebukola, 1986; Owens & Straton, 1980). A popular and rather extensively researched assumption in educational studies that developed out of the interactional perspective is the person-environment hypothesis, the assumption that a match between a student's preferred and actual studying conditions of competition, cooperation, and individualism enhances student achievement and performance on other school-related outcomes (Brown, 1984; Cohen, 1982, 1984; Eccles, 1983; Feather, 1982, 1988; Harvey, Hunt, & Schroder, 1961; Johnson, Maruyama,

Johnson, Nelson, & Skon, 1981; Lucker, Rosenfield, Sikes, & Aronson, 1976; Magnusson, 1988; Okebukola, 1986; Okebukola & Ogunniyi, 1984; Porter, 1986a, 1986b; Sherif & Sherif, 1969; Slavin, 1977; Slavin & Oickle, 1981; Widaman & Kagan, 1987; Zahn, Kagan, & Widaman, 1986).

A continuing problem in person-environment research is that classroom goal structures and scales that measure student attitudes toward these structures often confound competition, cooperation, and individualism with highly correlated yet conceptually distinct concepts such as rivalry, helping, and working alone. Recent research efforts have begun to test for the individual effects of small, well-defined aspects of goal structures in order to correct for this problem (Okebukola, 1986; Sharan, 1980; Slavin, 1980, 1985). Attitudinal scales, however, have not limited their measures to narrow, well-defined concepts. The limited number of scales that measure student attitudes toward competition, cooperation, and individualism suffer from one of three problems: 1) they confound or misrepresent the concepts they purport to measure, 2) they are based on economic, social exchange theories, or 3) they measure these concepts as alternative choices and thereby force them to be tri-polar and inversely related. Economic models, for example, do not measure attitudes toward competition, cooperation, and individualism, but instead are techniques for partitioning subjects into groups of competitors, cooperators, and individualists. Such models preclude a precise examination of the relationships among attitudes and restrict generalization across contexts as well. Continuous measures, on the other hand, can be

used to determine their interrelationships and relationships with other variables.

The major aim of the present study is to contrast student attitudes toward goal interdependence and social interdependence characterizations of competition, cooperation, and individualism. Social interdependence theory appears to confound or misrepresent goal interdependence structures and therefore may be inappropriate for person-environment studies and studies interested in the interrelationships of competition, cooperation, and individualism.

Goal Interdependence Theory

The foundation of research on competition, cooperation, and individualism, whether expressly noted or not, seems to rest on the concept of goal interdependence (Deutsch, 1949a; Johnson & Johnson, 1989; Pepitone, 1980, 1985; Slavin, 1980). Goal interdependence refers to situational conditions, behaviors, or dispositions that create perceptions of goal interconnectedness between or among individuals. The mere presence or absence of goal interdependence leads to perceptions of how much control one wields (see Figure 1). Competition and cooperation refer to a perceived presence of goal interdependence; and consequently, to a perception of shared or joint control over one's own outcomes as well as the outcomes of others with whom one is interconnected. In competitive or cooperative situations, people perceive themselves as exercising only partial control over their own outcomes and partial control over the outcomes of others as well. Control, both over processes and

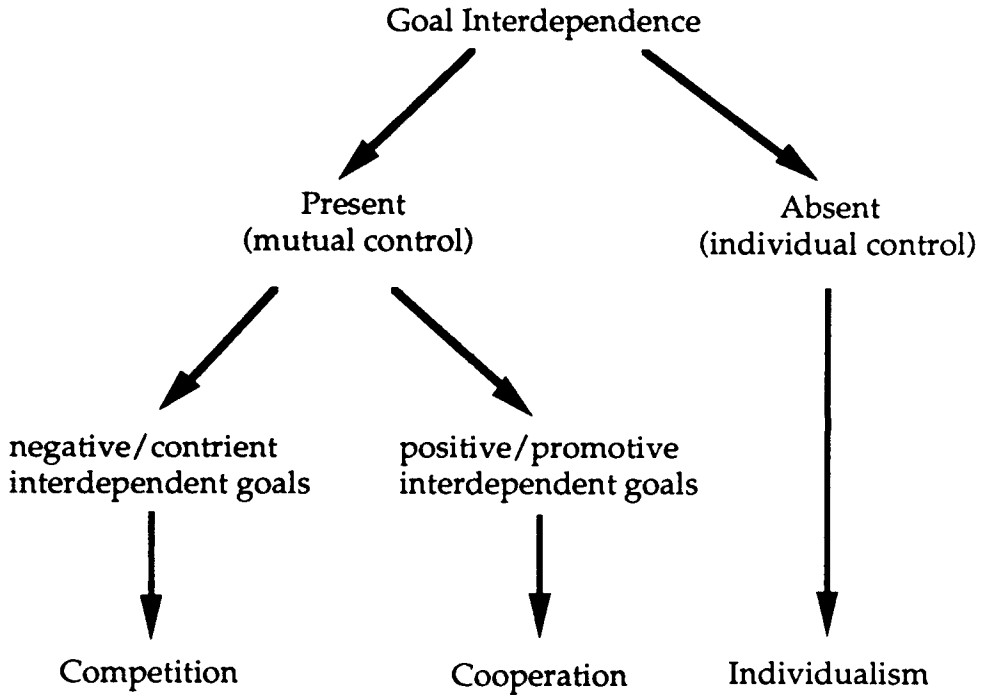

Figure 1. Goal Interdependence Characterizations of Competition, Cooperation, and Individualism.

outcomes, is shared with others. This mutual control is often experienced as a reliance on others for one's outcomes. In contrast, individualism is the perceived absence of goal interdependence; and consequently, a perception of personal control over one's own outcomes. As these characterizations suggest, it is not the existence or non-existence of mutual control or reliance that distinguishes cooperation from competition; instead, it is the nature of their interdependence. However, the presence of goal interdependence does distinguish competition and cooperation from individualism.

Deutsch (1949a) uses goal interdependence to characterize competition, stating that it exists when goals are negatively linked in such a way that the probability of one person attaining his or her goal is negatively correlated with the probability of another attaining his or her goals. Thus in competition, when an individual acts in such a way as to increase his or her chances of goal attainment, he or she decreases the chances of others with whom he or she is interconnected of attaining their goals. In contrast, cooperation exists when goals are positively linked in such a way that the probability of one person attaining his or her goal is positively correlated with the probability of others attaining their goals. Stated differently, when an individual acts in a way that increases his or her chances of goal attainment, he or she necessarily increases the chances of goal attainment for those with whom he or she is interconnected. Individualism exists when the goals of actors are perceived to be unrelated, when the actions of one person has no consequence for the goal attainment of another, and vise versa.

As these characterizations suggest, each of these concepts can be viewed as a correlation between the probability of one person attaining his or her goal and the probability of others attaining their goals. Competition represents a negative correlation; cooperation, a positive correlation; and individualism, a zero correlation.

Purpose

Although most researchers view competition, cooperation, and individualism in terms of goal interdependence, few have structured narrowly defined goal interdependence conditions in their studies. Instead, most studies confound competition, cooperation, and individualism with structures characterizing other concepts such as rivalry, helping, and working alone. This mingling of characteristics has obscured and/or distorted the relationship of competition, cooperation, and individualism to each other and to a wide spectrum of behaviors and other outcomes.

The purpose of this dissertation is to contrast competition, cooperation, and individualism when strictly characterized as goal interdependence conditions with other characterizations that mingle their characteristics with other highly related concepts. In order to do this, attitudes toward goal interdependence conditions and other measures of competition, cooperation, and individualism will be examined in an educational context. Several specific issues will be examined: 1) what are the interrelationships of competition, cooperation, and individualism when characterized as goal versus social interdependence, 2) what are the relationships of competition,

cooperation, and individualism with their theoretical correlates such as sociability, need for social comparison, fear of failure, and helpfulness; and 3) how well do goal and social interdependence measures of competition, cooperation, and individualism predict people's attitudes of various interdependent environments?

A second purpose of this study is to examine attitudes of college students toward goal interdependence conditions. Most of the current research on cooperative learning methods and student attitudes toward these methods has focused on large samples of students in primary and secondary schools. The data available on college students suggest that the pattern of interrelationships for competition, cooperation, and individualism for college students differs from the pattern of interrelationships for younger students (Johnson & Norem-Hebeisen, 1979).

CHAPTER 2

REVIEW OF THE LITERATURE

Of the rather wide expanse of research on competition, cooperation, and individualism, this review focuses on student attitudes toward goal interdependence situations and centers on five fundamental issues: 1) individual versus collective action, 2) the prosocial continuum, 3) helpfulness and interdependence scales, 4) current educational scales, and 5) correlates of competition, cooperation, and individualism. Each of these issues will be discussed briefly as they relate to the purposes of this dissertation.

Individual Versus Collective Action

One of the significant changes in the study of competition, cooperation, and individualism within education has been the change from viewing these concepts as goal interdependencies to social interdependencies (Johnson & Johnson, 1989, 1990; Pepitone, 1980). Although social interdependence is an expansion of goal interdependence, it also represents a movement within the educational system to restructure the classroom setting to increase student-student interactions (Johnson & Johnson, 1974; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Kagan, 1985; Sharan, 1980;

Slavin, 1980, 1983). These restructured classrooms, generally labeled cooperative learning methods (CLMs), have attempted to increase student interactions by structuring competition and cooperation within the classroom, with an emphasis on cooperation. A second, and for some an equally important purpose of the cooperative learning movement is to teach students prosocial behaviors that include not only cooperative behaviors but also helping, sharing, and intimate social interaction (Graves & Graves, 1985; Johnson & Johnson, 1989; Kagan, 1985). As a consequence of this multi-purpose approach, both the cooperative learning methods and the assessment of attitudes towards these structures tend to confound cooperation with helping and sharing, and individualism with working alone.

The original formulations of competition, cooperation, and individualism emphasized goal interdependence without a necessary inclusion of social interaction (Deutsch, 1949a; May & Doob, 1937; Mead, 1937). As Mead (1937) points out, individual and group activities are not necessary characteristics of competition, cooperation, or individualism. Persons engaging in these activities can do so in physical isolation or in face-to-face groups. For example, if an actor intends to obtain more of a shared goal than others, then he or she is competing, regardless of whether he or she pursues the goal under solitary or group conditions. The same holds true for cooperation and individualism. Competition, cooperation, and individualism are thus distinguished by the objective intentions of an actor, not by the modes of behavior in which the actor chooses to engage while pursuing his or her intentions (Kagan, 1977; McClintock, 1972, 1978). Researchers who have designed CLMs have understandably included social

interaction as an integral part of these methods. In doing so however, they have confounded social interaction as a necessary part of competition and cooperation, and have confounded isolation with individualism.

The Prosocial Continuum

Most current theories of competition and cooperation are expansions of Deutsch's (1949a) original formulation which described competition and cooperation as field conditions. In characterizing these field conditions, theorists have attempted to describe the constellation of forces that pressure people to act and the resulting behaviors that are consistently elicited under these pressures. These forces are believed to determine the basic climate of interpersonal relations and actions. Most theorists suggest that the antisocial aspects of competition and the prosocial aspects of cooperation are crucially important for characterizing competitive and cooperative conditions (Pepitone, 1980). Pepitone (1980) also describes competition as an obstructive environment in which other competitors become obstacles to the attainment of one's goal, whereas cooperation is described as a positive, friendly environment in which other cooperators become either an asset or a burden to the attainment of the group's goal.

Should competition and cooperation include a prosocial continuum as just described, and if so, what are the consequences? There seems to be a belief among some researchers that competition and cooperation are opposite ends of a morality dimension, or moral

orientation as Deutsch (1982) calls it. However, there are others who suggest that rivalry and helpfulness are only two of the many minor motives that underlie competitive and cooperative interactions respectively (Kagan, 1977; McClintock, 1972, 1978). For example, Kagan (1977) states that subsumed under competition are minor motives of rivalry and superiority, whereas subsumed under cooperation are minor motives of altruism, which contains a component of helping, equality, and group enhancement.

Certainly most researchers would agree that rivalry is more prevalent in competitive conditions and helpfulness is more prevalent in cooperative conditions. However, rivalry and helpfulness are not necessary aspects of competition and cooperation. The context determines in large part whether a prosocial continuum of rivalry-helping separates competition and cooperation. Education, unlike social economic contexts, are not necessarily zero-sum situations. Educators are able to structure within classrooms both competitive and cooperative outcomes and tasks. Consequently, rivalry and helpfulness can be reduced, if not eliminated, by structuring nonzero-sum contexts or by eliminating outcomes or grades. Economic models are largely based on an outcome orientation and are therefore more likely to pressure people to view competition and cooperation as competing alternatives.

Another consequence of confounding rivalry and helpfulness with competition and cooperation is to so change the pristine nature of competition and cooperation that the possibility of comparing attitudes toward competition, cooperation, individualism, rivalry, and helpfulness is essentially eliminated. Confounding these concepts

also compromises their generalizability. Another consequence of this linkage of constructs is to force competition and cooperation to become negatively correlated. Several studies have shown, when using partitioning techniques such as the decomposed games paradigm to identify competitors, cooperators, and individualists, that cooperators use a morality dimension to evaluate competitive and cooperative behavior such that cooperative behavior is seen as good and competitive behavior is seen as bad, whereas competitors use a potency dimension such that competitive behavior is seen as strong and cooperative behavior is seen as weak (Beggan, Messick, & Allison, 1988; Kelley & Stahelski, 1970; Liebrand, Jansen, Rijken, & Suhre, 1986; Rokeach, 1973).

Assuming that good and bad as well as strong and weak represent continua, the correlation between competition and cooperation should increase as their measurements include items that respondents might perceive as good versus bad or strong versus weak. The dimension of rivalry-helpfulness appears to make these perceptions possible. If one were to view the rivalry-helpfulness continuum from a prosocial perspective, it is likely that rivalry would represent the negative pole and helpfulness the positive pole. If rivalry-helpfulness were viewed from a potency perspective, it is likely that rivalry would represent strength or the ability to obtain one's own outcomes by oneself against others who would take them away and helpfulness would represent weakness or the inability to compete.

This analysis suggests that any measure of competition, cooperation, and individualism that confounds goal interdependence with other variables such as rivalry, helpfulness, or group work may

be distorting the relationships of these variables among themselves and with their theoretical correlates. In fact, the studies previously cited, which posit that cooperators evaluate competitive-cooperative behavior along a morality dimension and competitors evaluate it along a potency dimension, measure competition, cooperation, and individualism as tri-polar, opposing concepts. If subjects are forced to choose among these concepts, then it is likely that they wiil view them along dimensions that cause polarization.

Most mixed-motive games, such as the prisoner's dilemma and the decomposed prisoner's dilemma paradigms, force subjects to choose among behaviors representing these goal interdependencies. These paradigms force polarized thinking and eliminate the possibility that some individuals might like all three types of goal interdependence situations. They also require data analysis that employ categorical instead of continuous variables, thereby reducing statistical power.

Helpfulness and Goal Interdependence Scales

Characterizations of Cooperation and Helpfulness

A great deal of confusion continues to surround the issue of "What is the difference between helping and cooperation?" Both are forms of prosocial behavior, which are characterized by dependence, that increase the outcomes of other people (Grzelak & Derlega, 1982, Schwartz & Howard, 1982). The difference between these two concepts is believed to exist in the nature of their dependencies (see Figure 2).

Cooperation is a state of goal dependence which involves interdependence and mutual control. The contributions of any one actor affects in varying degrees the fate of all actors, so that each cooperative member is potentially an asset or a burden (Pepitone, 1980). This interdependence results in joint behavior directed toward a goal in which both actors have interests, or in other words, a common goal (Marwell & Schmidt, 1982). Joint behavior should not be misinterpreted to mean that participants are required to interact in a face-to-face way. Instead it requires only that all participants work toward their common goal which can be done in physical isolation from others or in face-to-face groups. It is the common goal or interest that connects cooperative individuals. An example of people working cooperatively and in physical isolation from others toward a common goal is found in cases of multiple authors contributing different chapters to a joint publication such as a book.

People who participate in cooperative endeavors have been found to be concerned with issues related to trust (Deutsch, 1960; Deutsch & Krauss, 1977; Krauss & Deutsch, 1966), that is, related to the question of whether the other person will follow a course of action that will enhance everyone's chances of goal attainment. Each actor in a cooperative situation has to rely on all other actors to complete their individual tasks in order for the common goal to be reached. Continuing the example of joint authorship, each author of a jointly authored book must rely on all other authors to complete their chapters before the book will be completed (cooperative task) and before they can share the revenues from book sales (cooperative outcome). In addition, cooperation is believed to provide all actors

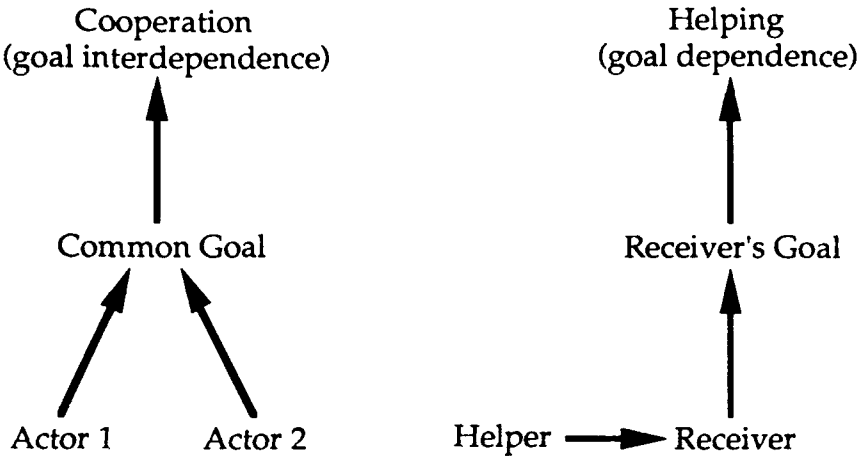

Figure 2. Goal Interdependence Characterizations of Cooperation and Helping.

with immediate benefits from acting cooperatively (Moore, 1984). That is, cooperation emphasizes immediate and mutual benefits that occur within the current situation. However as occurs in the case of multiple authorship, the interdependence situation may continue for a relatively long time during the task phase (writing the book) and the outcome phase (sharing the revenues over several years).

In contrast to cooperation, helping is characterized by goal dependence in which one actor is dependent upon another in order to attain his or her goal (see Figure 2). Helping behaviors always involve immediate costs of time, effort, and, often, resources to the helper and immediate benefits to the receiver. In response to the perceived discrepancy between costs and benefits, the receiver usually experiences feelings of obligation and debt to the helper. This arousal

or tension, generated as a need to repay the helper, is characterized as a generalized norm of reciprocity (Gouldner, 1960; Harvey & Gore, in press; Malinowski, 1932; Moore, 1984; Schwartz & Howard; 1982). The norm of reciprocity entails a kind of obligation. Gouldner (1960) states that "we owe others certain things because of what they have previously done for us, because of the history of previous interactions we have had with them" (Gouldner, 1960, p. 170). Helping behavior initiates a cycle of dependency involving debt and repayment; and due to its comparative indeterminance, a term Gouldner uses, the relationship continues across time to new situations. Comparative indeterminance refers to an inability to compare benefits, demands, and repayments across situations in order to conclusively terminate a relationship.

Helping in the example of a jointly authored book would occur if one of the authors asked a colleague to review what he or she had written to help find and eliminate confusing aspects of his or her chapter. The author would receive the immediate benefit of a better written chapter and would feel indebted to his colleague for having received his or her help. According to the norm of reciprocity, the author would feel obligated to reciprocate and would continue to feel this way until some form of repayment was given to the helper.

This analysis suggests that cooperation and helping behavior differ in at least three ways: 1) the nature of their dependencies, 2) the feelings they elicited, 3) and the nature of benefits and costs. Helping behavior is characterized as goal dependence and, through the mechanism of the norm of reciprocity, elicits feelings relating to guilt and moral behavior. Cooperation, on the other hand, is characterized

as goal interdependence which elicits feelings related to trust and has no necessary connection with morality unless it incorporates helping behavior and compliance to the norm of reciprocity (Gouldner, 1960; Harvey & Gore, in press).

Attitudes toward Goal Interdependence Conditions and Helping

The relationship between attitudes concerning cooperation and helping behavior are unclear. Specifically, do people who like cooperative situations also like helping situations? There is ample data showing that subjects in cooperative situations, compared to subjects in competitive or individualistic situations, perceive more instances of helping (DeVries & Edwards, 1974; DeVries, Edwards, & Slavin, 1978; Johnson, Johnson, & Tiffany, 1984; Weigel, Wiser, & Cook, 1975), and in behavioral studies that cooperation enhances helping (Johnson & Johnson, 1982a, 1982b; McClintock & Allison, 1989). However, the relationship between attitudes toward cooperation and helping has not been examined. One problem previously noted is that researchers often confound cooperation and helping in experimental conditions and in attitudinal scales. A second problem is that cooperation is often characterized as concurrent goal dependence instead of positive goal interdependence. However, most of the data suggest that attitudes toward cooperation and helping in educational settings should be highly correlated.

Most research studies have found that competitive situations, compared to cooperative ones, reduce helping and sharing, increase anti-social tendencies toward outgroup members, and increase the

frequency of behaviors intended to obstruct the efforts of others who are working to attain their goals (Deutsch, 1949b; Johnson & Johnson, 1989; McGuire & Thomas, 1975; Miller & Hamblin, 1963). These studies have focused largely on comparing competitive with cooperative situations, and have not focused on how to structure competition to increase helping. Helping and competition may not be antithetical concepts. In fact, most competitive situations are characterized by cooperative competition involving cooperation within one's group and competition with outgroups (Deutsch, 1982; DeVries & Edwards, 1974; Sherif, Harvey, White, Hood, & Sherif, 1988; Slavin, 1980). In these situations, participants often help one another prepare for competition. A preference for competition in the strict sense provides little information about preferences for helping unless competition is confounded with rivalry, thus creating a continuum of prosocial behavior.

There is virtually no research on the relationship between individualism, when characterized as a lack of interdependence, and attitudes toward helping behavior. Hypothetically, people could prefer to work in non-interdependent situations, yet be willing or unwilling to help others depending on the circumstance. As stated earlier, helping is a state of dependence, not interdependence. Although there are no data suggesting what the nature of this relationship might be, it appears that individualism and helping are unrelated at least conceptually.

Educational Scales of Student Attitudes toward Competition, Cooperation, and Individualism

Educational studies have generally used one of three means to measure competition, cooperation, and individualism: the Social Interdependence Scales (SIS, Johnson & Norem-Hebeisen, 1979); the Learning Preference Scales for Students (LPSS, Owens & Straton, 1980); or social value scales (Kagan, 1977; McClintock, 1972). Social value scales are forced choice techniques that partition subjects into groups of competitors, cooperators, and individualists but do not assess attitudes, and therefore will not be discussed. The SIS and LPSS are by far the most widely used measures of student attitudes toward classroom structures and are discussed in the following pages.

The Social Interdependence Scales (SIS)

The label of Social Interdependence Scales is a misnomer. These scales are composed of 22 items of which the cooperation and individualism scales have seven items each and the competition scale has eight items. As can be seen in Figure 3, six of the seven cooperation items refer implicitly or explicitly to helping and sharing, and one item refers to cooperation. The one item that does refer to cooperation is undefined, asking students if they like to "cooperate" with other students. None of the items refer to positive or promotive interdependence. Of the seven individualism items, none refer to a lack of goal interdependence, but refer instead to working alone. As noted in previous discussions, Mead (1937) suggested that working in

Competitive Items.

1. I like to do better work than other students.
2. I work to get better grades than other students do.
3. I like to be the best student in the class.
4. I don't like to be second.
5. I like to compete with other students to see who can do the best work.
6. I am happiest when I am competing with other students.
7. I like the challenge of seeing who is best.
8. Competing with other students is a good way to work.

Cooperative Items.

1. I like to help other students learn.
2. I like to share my ideas and materials with other students.
3. I like to cooperate with other students.
4. I can learn important things from other students.
5. I try to share my ideas and materials with other students when I think it will help them.
6. Students learn lots of important things from each other.
7. It is a good idea for students to help each other learn.

Individualistic Items.

1. I don't like working with other students in school.
2. I like to work with other students. (reverse)
3. It bothers me when I have to work with other students.
4. I do better work when I work alone.
5. I like my work better when I do it all myself.
6. I would rather work on school work alone than with other students.
7. Working in small groups is better than working alone. (reverse)

Figure 3. Competition, Cooperation, and Individualism Items for the Social Interdependence Scales.

Note. From "A measure of cooperative, competitive, and individualistic attitudes" by D. Johnson and A. Norem-Hebeisen, 1979, Journal of Social Psychology, 109, p. 260. Copyright 1979 by The Journal Press. Reprinted by permission.

physical isolation from others is conceptually distinct from working in a non-interdependent state. All competition items refer to competitive grades and tasks and appear to be a measure of negative interdependence. Although Johnson and Norem-Hebeisen (1979) claim that their scales measure interdependence, this appears not to be the case. Instead, the social interdependence (SI) cooperation scale measures student attitudes toward helping and sharing and the SI individualism scale measures student attitudes toward working alone.

Johnson and Norem-Hebeisen (1979) conducted a factor analysis on the responses of over 6000 students in grades 1-12 and 152 college undergraduates on the items of the SI Scales. Competition and cooperation, as they operationalized these scales, were independent constructs. Competition and individualism were found to be positively correlated ($r = .24, p < .01$), although individualism, as noted, was operationalized as working alone. However, the correlation between cooperation and individualism was -.32 for the overall sample and -.60 for the college sample.

Johnson and Norem-Hebeisen (1979) concluded from these results that competition and cooperation were orthogonal, that competition and individualism were orthogonal, and that the correlation between cooperation and individualism, although significantly negative, was not high enough to support viewing them as opposite ends of the same continuum. Overall they conclude that "...these three types of social interdependence are not on a single dimension, and further research is needed to clarify the nature of their relationship (Johnson & Norem-Hebeisen, 1979, p. 259)." Johnson and associates have not

yet reported further research on this issue despite identifying the need. In fact in a recent article (Johnson, Johnson, Buckman, & Richards, 1986), the Social Interdependence Scales had not been changed by a single word.

Given that this instrument failed to measure goal interdependence for cooperation and individualism, and the fact that the relationship between cooperation and individualism is significant, one must question the validity of their concepts and conclusions.

Learning Preference Scale for Students (LPSS)

Owens and Straton (1980) criticized the Johnson and Norem-Hebeisen (1979) instrument on a number of grounds, but not on their characterizations of these three constructs. Owens and Straton (1980) assessed essentially the same content, cooperation as a preference to work in groups, competition as besting others, and individualism as working alone, and obtained essentially the same results. Their factor analysis, using 1643 subjects in primary and secondary schools, produced a five factor solution, three of which were cooperation, competition and individualism, that were relatively independent. The results showed that competition and cooperation were uncorrelated, competition and individualism had a significant positive correlation ($r = .30, p < .01$), and cooperation and individualism had a significant negative correlation ($r = -.39, p < .01$). Owens and Straton concluded that competition, cooperation and individualism were independent constructs, a conclusion that would have been more credible if they had measured goal interdependence.

Both of these studies were based on large samples of grade school students, as was an earlier study by Johnson and Algren (1976). There are little data on the relationships between student attitudes toward competition, cooperation, and individualism for college samples. However, the Johnson and Norem-Hebeisen (1979) study found, for a college sample of 152 undergraduates, that competition and cooperation were uncorrelated, competition and individualism were uncorrelated, and cooperation and individualism had a high negative correlation ($r = -.60, p < .01$). Again these results must be viewed skeptically because cooperation and individualism are operationalized as helpfulness and working alone respectively. However, the results of the Johnson and Norem-Hebeisen (1979) and the Owens and Straton (1980) studies suggest that competition and helpfulness are orthogonal, competition and working alone are orthogonal, and helpfulness and working alone are inversely correlated.

Another issue is whether the SIS and LPSS can be used to predict relationships with other variables, especially variables related to cooperative learning methods (CLMs). Most CLMs are a mixture of various activities including giving and receiving help, sharing, working alone and in groups, cooperative grades and tasks, competitive grades and tasks, individualistic grades and tasks, and so forth. Given that cooperative classrooms are a mixture of these techniques, it is likely that attitudes toward competition, cooperation, and individualism will not predict global measures of preference for these classes unless the class is exclusively of one type. Instead, these scales should predict attitudes toward the individual aspects of the overall classroom. Because Johnson and Norem-Hebeisen (1979) and

Owens and Straton (1980) have measured helping and group work instead of cooperation, and working alone instead of individualism, it is likely that their measures will predict student attitudes toward cooperative classroom structures only to the extent that these structures contain helping, group work, and working alone. Additionally, their measures are more task-oriented and therefore should be less effective in predicting preferences for cooperative and individualistic grades. The Johnson and Norem-Hebeisen (1979) and Owens and Straton (1980) competition scales measure attitudes toward competitive grades and tasks and therefore are more than just task measures.

Other Correlates

In order to validate any measure of attitudes toward competition, cooperation, and individualism, empirical testing of these scales with other constructs is essential.

Sociability

In this study, sociability is characterized as an interest in interacting with other students in a variety of situations. The nature of these interactions is not an important distinction and could potentially include a wide variety of situations, none of which are expressly interdependent.

There are a limited number of studies that have examined the relationship between sociability measures and the Social

Interdependence Scales, with mixed results. From an administration of the MMPI and Social Interdependence Scales to white, middle class high school students, Johnson and Norem-Hebeisen (1977) found that the amount of social participation was positively and significantly correlated with cooperation and competition, and uncorrelated with individualism. In a recently reported study with ice hockey players trying out for the 1980 U. S. Olympic Ice Hockey Team, Johnson, Johnson and Krotee (1986) found that cooperation was positively correlated with the sociability scale (outgoing, sociable) in the California Psychological Inventory, but uncorrelated with competition and individualism.

The results are inconclusive, but it does appear that the social interdependence (SI) cooperation scale is positively related to sociability. However, a continuing problem for this research is that the SI cooperation scale appears to be a measure of helping; and therefore, the relationship between cooperation, when characterized as a goal interdependence condition, and sociability requires empirical study. Although goal interdependence (GI) characterizations of cooperation do not require cooperating individuals to be sociable or even interact, more often than not cooperation includes sociable interactions and should be moderately related to sociability.

The relationship of sociability with competition and individualism is less clear. Johnson and associates suggest that a person who scores high on both cooperation and competition should be a highly social person who likes to interact with other people in a variety of ways, whereas a person who scores low on both scales will generally prefer to isolate himself or herself across situations (Johnson

& Johnson, 1989; Johnson & Norem-Hebeisen, 1979). However, the nature of sociability differs, on average, in competitive and cooperative situations. Promotive interdependence situations (cooperation) require people to work toward common goals from which everyone benefits, and are thus more likely to create perceptions of a positive experience. If a situation is structured to be a promotively interdependent and social experience, then it should create perceptions of a positive social experience. In contrast, competitive situations can include a greater variety of positive and/or negative social experiences in which there are many more losers than winners. It is likely that competition, on average, should not be as highly correlated with sociability as cooperation due to the negative affect elicited from the large number of losers in competitions.

The relationship between individualism, when characterized as a lack of goal interdependence, and sociability is unknown. A person could prefer individualistic situations for a variety of reasons, including the reasons that they do not like to socialize or that they prefer to keep their work and social activities separated. This possibility suggests that individualism and sociability should be unrelated, but this hypothesis requires testing.

In order to test these hypotheses, a sociability scale containing items like "I enjoy spending free time with people more than being by myself" or "I like to take an active part in school activities such as sports, clubs, drama, et cetera" will be developed and its results will be reported in this study.

Need for Social Comparison

The relationship between competition and the need for social comparison has received considerable theoretical and empirical support. Several studies have found that as the availability of socially comparative information increases so does competitive behavior (Dakin & Arrowood, 1981; Levine, 1983; McClintock & McNeel, 1967, 1968; McClintock & Messick, 1966; McNeel, Sweeney, & Bohlin, 1974). In addition, most experimental manipulations used to produce competitive situations contain salient socially comparative information about the performance of others (Levine, 1983; Johnson & Johnson, 1989; Pepitone, 1980; Slavin, 1980,1990). Although these data clearly suggest that student attitudes about competition and social comparison should be intimately connected, there are no data that address the relationship between these attitudes.

The relationship between cooperation and social comparison has not received much theoretical or empirical attention. Cooperative situations are usually structured to minimize comparative information, a manipulation that may operate to avoid competition rather than to structure cooperation. Most theories of cooperation involve principles of equity, equality, and other rules of fairness (Deutsch, 1982; Lerner, 1977; McClintock & Van Avermaet, 1982; Rawls, 1972) all of which presuppose the availability of socially comparative information. For example, people must have information available regarding the outcomes and efforts of both self and others in order to determine whether their outcomes are equitable

or not. The same information is required to make determinations regarding equality. However, unlike competitive tasks which by their very nature require comparative information in order for people to perform, cooperative tasks do not require comparative information and can be performed without contact with other people. This analysis suggests that competitive and cooperative outcomes (products) require socially comparative information, whereas only competitive processes require comparative information.

In an information processing study, Liebrand and McClintock (1988) confirmed their hypothesis that competitors and cooperators required more time to choose between alternative outcome distributions for self and other, presumably because they had to compare their own outcomes to the outcomes of others, than did individualists and altruists who needed only to look at their own or the other's outcome respectively. This study suggests that cooperators exhibit a need to compare their outcomes with the outcomes of others. Therefore, if social comparison is characterized as a need to compare one's own outcomes with the outcomes of others, then cooperation should be positively correlated with social comparison. Cooperation should not correlate as highly with social comparison as competition because the fundamental nature of competition is to maximize the difference in outcomes received.

There are no data available, that I know of, that relates individualism with the need for social comparison. However, individualism should be unrelated to social comparison because it only refers to the conditions in which people prefer to work toward their goals and therefore provides no information about whether one

values information about the performance of others. This hypothesis should be accurate for people who prefer individualistic activities; however, a preference for individualistic outcomes could result from liking individualistic outcomes or disliking interdependent outcomes. In the first case, individualism and social comparison are likely to be uncorrelated, whereas in the second case, individualism and social comparison are likely to be negatively correlated.

Fear of Failure

A primary characteristic of people who score high on fear of failure measures is that they strive to avoid failure experiences. This goal can be achieved in a number of ways, such as avoiding certain types of situations, misinterpreting failure experiences, or changing aspiration levels (Birney, Burdick, & Teevan,1969; Harvey & Sherif, 1951; Gould, 1939; James, 1890; Schroder & Hunt, 1957; Sears, 1941). Birney, Burdick and Teevan (1969) state that the most obvious strategy to avoid failure experiences is to avoid situations in which failure always exists as a possibility. The structure of competition ensures that failure is a likely possibility. In fact, one of the main criticisms of competition in educational settings is that it produces few winners and many losers (Johnson & Johnson, 1989; Kagan, 1985; Pepitone, 1980). The two central fears of people who score high on fear of failure scales are lowered self-esteem and lowered evaluation of self by others (Birney, Burdick, & Teevan, 1969). Both of these fears require socially comparative information be available to people which is more abundant in competitive situations.

It has been found that persons who score high on fear of failure tend to perform poorly in noncooperative situations and worse in competitive situations (Birney, Burdick, & Teevan, 1969). Atkinson and Feather (1966) in describing the image of a fear of failure person, state that such a person resists activities in which their competence might be evaluated against others and that they lack the motivation to engage in the "customary competitive activities of life." This analysis suggests that competition and fear of failure should be negatively correlated.

The relationships of cooperation and individualism with fear of failure is not known. Atkinson and Feather (1966) suggest that fear of failure causes one to prefer cooperative situations that permit practice and skill development, especially if successes and failures are shared. However, this description entails only one reason for preferring cooperation, while a host of other possibilities exist as suggested in the prosocial literature.

Hypotheses

The focus of this study is to compare student attitudes toward goal interdependence and social interdependence characterizations of competitive, cooperative, and individualistic structures (Johnson & Norem-Hebeisen, 1979) in educational settings. The comparisons will be based on the interrelationships of competition, cooperation, and individualism; their relationships with helpfulness, sociability, need for social comparison, and fear of failure; and their abilities to predict student attitudes toward vignettes that describe competitive,

cooperative, and individualistic structures in actual classrooms. The goal interdependence scales will be examined as global scales of interdependence and as grade and task subscales.

An important and fundamental assumption that guides this project is that measures of competitiveness, cooperativeness, and individualness are context specific. That is, global attitude scales that survey attitudes across a variety of domains such as sports, education, and economic, political, and social relationships or that measure attitudes using abstract or contextless items, are largely unpredictive of attitudes in highly specific contexts. This assumption reflects the findings that predictions are enhance when the level of specificity for dependent and independent variables are commensurate (Ajzen & Fishbein, 1977; Magnusson, 1988). Therefore, mixed-motive measures of goal interdependence such as the prisoner's dilemma and decomposed games paradigms should have little predictive ability in contexts other than zero-sum or gaming situations.

This assumption has implications for measures of competition, cooperation, and individualism in educational settings. In educational settings, goal interdependence is usually structured in one of two ways: by grades or by tasks. It is possible that students could have different reactions to goal interdependent grades and tasks. For example, a student might like competitive activities because students playfully tease one another or because competition is used to prepare all students for an examination. However, he or she might dislike it when his or her grades are based on these same competitive activities or when students take tests by themselves and their grades are assigned on the basis of how well they score compared to other

students. This analysis suggests that the pattern of relationships for goal interdependent grades and tasks may differ. Specifically, the pattern of interrelationships, the pattern of relationships with other variables, and the pattern of predictions may differ for global scales of goal interdependence, grade subscales of interdependence, and task subscales of interdependence. Where possible, different hypotheses for each of the scales and subscales will be made.

Hypothesis 1

Student attitudes toward competitive, cooperative, and individualistic classroom settings are orthogonal when measured as goal interdependencies.

Hypothesis 2

The SI competition and cooperation scales are orthogonal, competition and individualism scales are orthogonal, and cooperation and individualism scales are negatively correlated. Parts one and three of these hypotheses are based on the analysis suggesting that the SI cooperation scale is largely a measure of helpfulness. See Hypothesis 4 for an explanation of the relationships between helpfulness and competition, and helpfulness and individualism.

Hypothesis 3

The SI cooperation scale is a measure of helpfulness and sharing, and is unrelated to the GI cooperation scale when controlling for the effects of helpfulness.

Hypothesis 4

Helpfulness is positively correlated with cooperation and uncorrelated with competition and individualism. This hypothesis should hold true for global scales and GI task subscales. The SI individualism scale, which measures attitudes toward working alone, is negatively correlated with helpfulness.

Hypothesis 5

Sociability is positively correlated with cooperation and competition, and uncorrelated with individualism according to goal interdependence theory and Johnson and Norem-Hebeisen (1979). Cooperation is more highly correlated with sociability than is competition. This hypothesis applies to goal interdependent tasks more than grades because sociability, like tasks, is characterized in terms of behaviors in this study.

Hypothesis 6

Social comparison is positively correlated with goal interdependence characterizations of competition and cooperation, and uncorrelated with individualism. Competition correlates more highly than cooperation with social comparison. Of the three goal interdependence task subscales, only the competition task subscale is significantly correlated with social comparison.

Hypothesis 7

Fear of failure is negatively correlated with attitudes toward competition, and uncorrelated with attitudes toward cooperation and individualism.

Hypothesis 8

The GI and SI competition scales and subscales predict student attitudes toward competitive classroom structures which allow students to help one another or not.

Hypothesis 9

The SI cooperation does not predict student attitudes toward cooperative classroom structures devoid of helping and socializing, but does predict student attitudes toward cooperative classroom

structures that contain helping and socializing. The GI cooperation scale predicts student attitudes toward both of these cooperative classroom structures.

Hypothesis 10

The SI individualism scale does not predict student attitudes toward individualistic structures that allow students to help one another, but does predict student attitudes toward individualistic structures that require students to work alone. The GI individualism scales and subscales predict student attitudes toward both of these individualistic classroom structures.

CHAPTER 3

METHOD

Subjects

All subjects for this study came from the Introductory Psychology subject pool at the University of Colorado, Boulder which requires students enrolled in Psychology 1001 to complete five hours of experimental course work as part of their course requirements. The present study was one of approximately 40 among which students were allowed to choose. Students were not given any information that they could use to select one study over another; instead, they usually chose the study that best fit their schedule.

A total of 150 subjects participated in this study of whom 46 percent (n = 69) were female students and 54 percent (n = 81) were male students. The average age for participating subjects was 19.01 years with a range from 18 to 26 years. The majority of subjects were enrolled or intended to enroll in either the School of Arts and Science (59%), the Business School (30%), the School of Engineering and Applied Science (7%), or some other major. The distribution of subjects by class was 49 percent freshmen (n = 74), 37 percent sophomores (n = 55), 11 percent juniors (n = 16), and 3 percent seniors (n = 5). The majority of subjects were White students although other

races such as Mexican-American, Chinese, Japanese, and Black were represented in small numbers.

Instruments

A booklet containing five questionnaires were given to all subjects. Student attitudes toward competitive, cooperative, and individualistic classroom structures were measured by the Goal Interdependence Scales, which in this study was called the School Setting Questionnaire (SSQ), and was developed for the purposes of this study. Students attitudes toward competition, cooperation, and individualism were also measured by the Social Interdependence Scales (Johnson & Norem-Hebeisen, 1979). Additionally, subjects were given a fear of failure self-report instrument (Houston & Kelly, 1987), and scales measuring helpfulness, sociability, and need for social comparison. The final questionnaire, constructed for this study, was called the Classroom Questionnaire which contained several vignettes describing various competitive, cooperative, and individualistic grade and task interdependencies in actual classroom settings.

All questionnaires were combined into a single booklet which contained separate instructions for each questionnaire. Students were required to respond to all questionnaire items on a six-point, forced-choice, Likert-type scale from 1 to 6. The response scales were forced-choice because they did not have a neutral point. Appendix A contains all questionnaires as they were given to the subjects.

Fear of Failure

Subjects' fear of failure were measured by a ten-item self-report measure constructed by Houston and Kelly (1987) with strict adherence to the conceptualization of fear of failure by Birney, Burdick, and Teevan (1969). This instrument has received little empirical testing other than the original study. Subjects respond to such items as "When I compete with someone that seems to be better than I am, I sort of give up trying" or "If I do poorly on something, I usually prefer to not let anyone else know or try to cover it up."

Nine of the ten items were from the Houston and Kelly scale, and I added a tenth item: "I would avoid taking a course in which I might do poorly even if it were very interesting." The scale was further modified to keep subjects on a six-point, forced-choice, Likert-type scale instead of the five-point Likert-type scale used in the original study. Subjects were required to indicate how well each of the items described them, from "1", which indicated that the statement was totally false about self through "6", which indicated that the statement was totally true about self.

The Cronbach reliability score in the Houston and Kelly (1987) study was .66. A pilot study which used the university subject pool (n = 49) had a Cronbach alpha of .57 for the fear of failure scale, and the Cronbach alpha for this study was .69.

Social Interdependence Scales

The Johnson and Norem-Hebeisen (1979) Social Interdependence Scales were modified to keep subjects on a six-point, forced-choice response scale. Subjects responded to items by indicating how strongly they agreed or disagreed with each statement. A response of "1" indicated that the subject strongly disagreed with the statement and a response of "6" indicated that the subject strongly agreed with the statement.

The scales were composed of 22 items, the competition scale had eight items, the cooperation scale had seven items, and the individualism scale had seven items. These scales have been used in many studies over the last decade and have consistently had Cronbach alphas greater than .70 (for a review see Johnson & Johnson, 1989). In a pilot study, the Cronbach alphas were as follows: competition scale, .87; cooperation scale, .88; individualism scale, .65. In this study, the Cronbach alphas were: competition scale, .88; cooperation scale, .75; individualism scale, .80.

Helpfulness Scale

The helpfulness scale asked students about their attitudes toward helping behaviors in educational settings. The scale was composed of sixteen items referring to helping tasks and represented four content areas or subscales: 1) global preferences, the extent to which students like helping and receiving help from other students; 2) motivation,

the extent to which students experience helping others as motivational, challenging, exciting, and so forth; 3) relationships, the extent to which students enjoy the relationships that develop when students help each other with their assignments; and 4) instrumentality, the extent to which students believe that helping other students leads to positive outcomes for themselves, such as better performance, learning more quickly, better ideas, greater future success, and better understanding of materials. The following are examples of the types of questions developed, "I like to help other students learn," "I do my best work when I share ideas and help other students learn," "I like classes in which students are required to help one another learn the material assigned." The helping scale was developed for this study. See Appendix A for a listing of all items.

The Cronbach alpha for the pilot study was .91. The present study, which had two less items, also had a Cronbach alpha of .91.

Need for Social Comparison

This scale was composed of six items that referred to a need for students to compare their grades and performances with the grades and performances of other students. The items were: "I often ask other students how they scored on a test," "I feel a strong need to know how others have performed on a test," " In order to feel that I really understand how I've performed on a test, I want to know both how I have performed and how other students have performed," "I like to find out how I've scored compared to other students on tests and papers," "I am content to know only my own grade on a test or

paper (reverse scored)," and "I like it when professors summarize how the class performed on a test because it helps me understand how I did compared to other students."

Each item was rated on a six-point, forced-choice, Likert-type scale that indicated how strongly the respondent agreed or disagreed with each statement. The Cronbach alpha in the pilot study was .71. Some of the items for the pilot study were rewritten and an item was added for the present study. The Cronbach alpha for the present study was .87.

Sociability

The sociability scale had nine items that referred to a preference for socializing with other students. This scale was developed by modifying items from Cattell and Child's (1975) "gregariousness" erg, the Minnesota Multi-Phasic Inventory (MMPI) social participation scale, and the California Personality Inventory (CPI) sociability scale to make them more appropriate for educational settings. The items were carefully worded to emphasize a desire for social interaction while de-emphasizing the nature of interaction.

Each item was rated on a six-point, forced-choice, Likert-type response scale that indicated the degree to which respondents agreed or disagreed with each statement. The Cronbach alpha for this scale in the pilot study was .66. The sociability scale was expanded by four items and several of the items in the pilot study were rewritten for the present study. The new scale had a Cronbach alpha of .75.

Goal Interdependence Scales

The goal interdependence scales for competition, cooperation, and individualism were constructed for this study by adhering strictly to the conceptualization of goal interdependence theory (Deutsch, 1949a, 1982; Johnson & Johnson, 1989; Pepitone, 1980). This instrument was composed of 78 items. The competition scale consisted of 24 items, the cooperation scale had 26 items, and the individualism scale contained 28 items. Each global scale (that is competition, cooperation, and individualism) had two major subscales relating to grades and tasks. Each of the major subscales (grade and task) were divided into minor subscales that measured student attitudes toward different aspects of the various interdependence conditions. These minor subscales, each of which had from two to seven items, were: 1) global attitudes, 2) motivation, 3) relationships, and 4) instrumentality.

Global attitude items refer to an overall preference for the various goal interdependencies. An example of an item of global preference for cooperative tasks is "I like to work on school projects that require both my own efforts and the efforts of other students in order to complete them." Motivation items refer to feelings of motivation, challenge, excitement, or happiness for the various goal interdependencies. For example, "I feel motivated when my grades are based on my own efforts and no one else can influence them." Relationship items refer to student attitudes about the relationships that develop in competitive and cooperative goal interdependence conditions, but not in individualistic conditions. For example, "I like

the relationships that develop between students when they try to outperform each other on a task." And finally, instrumental items refer to the belief that positive outcomes are forthcoming under certain conditions. For example, "I learn my school work quickly when I'm trying to outperform others."

The following is a summary of the goal interdependence scales and subscales: three global scales (competition, cooperation, and individualism); six grade and task major subscales (competitive grade and task subscales, cooperative grade and task subscales, and individualistic grade and task subscales); and nineteen minor subscales for global attitudes, motivation, relationships, and instrumentality . There were no grade and task minor subscales involving relationships for individualism.

Students responded to each item by indicating the extent to which they agreed or disagreed with each statement on a six-point, forced-choice, Likert-type scale. The Cronbach alphas for the global scales in the pilot study were: competition, .88; cooperation, .91; individualism, .88. New items were added to each scale, as necessary, in this study in order to retain some of the minor subscales that were lost in the pilot study. The Cronbach alphas for the global scales in the present study were: competition scale, .95; cooperation scale, .91; individualism scale, .92.

Classroom Questionnaire

The classroom questionnaire contained a series of eight vignettes that described features of competitive, cooperative, and individualistic

classroom activities. Each vignette fully described real-life grade and task interdependencies in either a competitive, cooperative, or individualistic condition. Vignette #8 is an exception in that it combined competitive, cooperative, and individualistic interdependencies in a single description. The purpose of these vignettes was to determine how well the goal interdependence and social interdependence scales would predict various classroom structures, and thus serves a validity measure for the scales.

Each goal interdependence condition, that is competition, cooperation, and individualism, was characterized in two vignettes that were identical with the exception that one vignette in the pair allowed students to help one another and the other did not. The eight vignettes were: 1) competitive tasks and grades without helping; 2) individualistic tasks and grades without helping; 3) cooperative tasks and grades without helping; 4) individualistic tasks and grades with helping; 5) competitive tasks with helping ; 6) cooperative grades and tasks with helping; 7) cooperative tasks and grades with helping; 8) competitive, cooperative, and individualistic grades and tasks with helping. Vignettes six and eight were not paired with other vignettes, but were descriptions of two of the CLMs currently in use by researchers.

Subjects were instructed to read each vignette carefully and then to answer a series of questions on the opposite page that asked about their attitudes toward the competitive, cooperative, and individualistic aspects of the activity. Each vignette explained how students were to accomplish classroom assignments and how grades were to be assigned based on performance. For example,

Activity #1. Your instructor assigns new material for students to learn during a two week block. During the first week the instructor teaches the material to the whole class. During the second week, students are given time to study the material. At the end of the second week, students engage in one-on-one competitions for points, in a game-type format, against other students in the class.

Since it is a small class (20 students), every student will compete against every other student in the class many times during the competitions. Each student accumulates points based on these competitions. Your grade is assigned based on the total number of points you get in competitions and your score on a quiz covering all of the materials. Students tend not to study together since they are constantly competing with one another.

Procedure

At the beginning of the study, all experimental subjects were seated in a classroom and given an introductory sheet that explained who was conducting the experiment, the students' rights as experimental subjects, the nature of the study, and a brief list of questions that represented the types of questions they would be answering. After the subjects had finished reading the introductory sheet, the experimenter briefly described the various questionnaires and read aloud the instructions to each questionnaire to ensure the subjects understood how they should respond to the questions. Subjects marked their responses on an optical scan sheet. The experimental subjects were given two hours to complete all questionnaires and were allowed to proceed at their own pace. The average time taken to complete the booklet of questionnaires was approximately 75 minutes, with a range of 45 to 105 minutes.

CHAPTER 4

RESULTS

Demographics

No difference was found between male and female subjects for fear of failure, sociability, need for social comparison, or helpfulness. There was only one significant difference found between male and female students for the goal interdependence and social interdependence scales. Male subjects scored significantly higher on the social interdependence (SI) competition scale than did female subjects, F (1,146) = 7.99, p =.005. The mean score for male students was 4.00, s. d., .89 and the mean score for female students was 3.52, s. d., 1.00. However, no gender difference was found for the goal interdependence (GI) competition scale nor for either of its subscales (competitive grades or tasks). In addition, no significant difference was found between subjects who were enrolled or intended to enroll in different schools within the university for fear of failure, sociability, need for social comparison, helpfulness, and all measures of interdependence.

Hypothesis 1: The Goal Interdependence Scales are Orthogonal

Two approaches were taken to develop goal interdependence scales and to determine the relationships between them. The first approach was to develop factor analytic scales and the second approach was to develop a priori or additive scales by adding the scores of all competitive items to develop the competition scale, and to do the same for the cooperation and individualism scales.

Factor Analysis

All items for the 19 subscales were factor and item analyzed to develop a statistically and conceptually relevant group of subscales. Next, these subscales were factor analyzed. Several extraction and rotation procedures were employed all of which gave essentially the same solution. A principal-components extraction procedure will be reported for an orthogonal and oblique rotation.

A varimax rotation method produced a four factor solution that accounted for 74% of the total variance. Communalities ranged from .58 to .89 with one subscale falling below this range. Factor 4, which accounted for 6% of the total variance, consisted of four subscales, two of which loaded higher on other factors (using .4 as criterion for significant loadings) and two of which loaded significantly on the individualism factor. Next, the subscales were forced to a three factor solution. The three factor solution produced a competition factor with all competition subscales loading between .70 and .90; a cooperation

factor with all cooperation subscales loading between .47 and .86 as well as two of the three individualism task subscales loading (-.45, -.40); and an individualism factor with all individualism subscales loading between .66 and .86.

An oblimin rotation method produced a four factor solution that was very similar to the varimax four factor solution. Factor 3 was an individualistic grade factor and all of its subscales loaded significantly on other factors. A forced three factor solution produced a structure matrix similar to the three factor varimax solution. The three factor solution produced a competition factor with all competition subscales loading between .70 and .90; a cooperation factor with all cooperation subscales loading between .50 and .87 as well as all three individualism subscales loading significantly (-.50, -.51, -.49); and an individualism factor with all individualism subscales loading between .72 and .86 as well as two cooperation subscales loading significantly (-.42, -.41).

The orthogonal and oblique solutions were very similar. Both three factor solutions produced a competition factor, a cooperation factor that allowed two or three individualism subscales to load significantly, and an individualism factor that allowed two cooperation subscales to load significantly in the oblique solution. The structure matrices showed that these solutions were essentially the same except the oblique solution allowed the cooperation and individualism subscales to load higher on the individualism and cooperation factors respectively. Table 1 contains the intercorrelations for the factors from the three factor oblique solution and shows that competition and cooperation had a low positive and insignificant correlation, that competition and

Table 1

Intercorrelations of GI Scales, Intercorrelations of SI Scales, and Correlations between the GI Scales and SI Scales for Oblimin Factor Scores and A Priori Scores

	GI Factor Scales			SI Factor Scales		
	Comp	Coop	Ind	Comp	Coop	Ind
GI Factor Scales						
Competition						
Cooperation	.13					
Individualism	-.06	-.39**				
SI Factor Scales						
Competition	.73**	.15	.06			
Cooperation	.08	.37**	-.39**	-.05		
Individualism	.09	-.14	.25**	.04	-.16	
	GI A Priori Scales			SI A Priori Scales		
	Comp	Coop	Ind	Comp	Coop	Ind
GI A Priori Scales						
Competition						
Cooperation	.19*					
Individualism	.07	-.47**				
SI A Priori Scales						
Competition	.75**	-.06	.03			
Cooperation	.18	.42**	-.59**	.08		
Individualism	.03	-.08	.50**	.01	-.29**	

* $p < .05$. ** $p < .01$. Pairwise, two-tailed.

individualism were uncorrelated, and that cooperation and individualism were negatively and significantly correlated ($r = -.39, p < .01$), but not highly enough to be considered a continuum.

A Priori Scales

A priori scales were calculated for competition, cooperation, and individualism. The a priori scales were developed by adding together all conceptually consistent items for each of the three scales. The results were very similar to the factor analytic results. The competition and cooperation scales had a low positive, yet significant, correlation ($r = .19, p < .05$), the competition and individualism scales were uncorrelated, and the cooperation and individualism scales were significantly and negatively correlated ($r = -.47, p < .01$).

When the a priori global scales were decomposed into grade and task subscales, a different pattern of relationships was found (see Table 2). Grade and task subscales, within each global scale, had high positive correlations. Competitive grades had a significant positive correlation with cooperative grades and a significant negative correlation with individualistic grades. In addition, cooperative grades had a significant negative correlation with individualistic grades. This pattern of results appears to contrast competition and cooperation with individualism along a goal interdependence continuum. That is, competitive and cooperative grades represent conditions of goal interdependence whereas individualistic grades represent a condition of no goal interdependence. However, this pattern was not replicated for

Table 2

Intercorrelations of GI Grade and Task Subscales

	Competition		Cooperation		Individualism	
	grade	task	grade	task	grade	task
Competition						
grade						
task	.85**					
Cooperation						
grade	.27**	.25**				
task	.10	.16	.71**			
Individualism						
grade	-.25**	-.08	-.39**	-.24**		
task	.01	.03	-.37**	-.54**	.57**	

* $p < .05$. ** $p < .01$. Pairwise, two-tailed.

interdependent tasks. Competitive and cooperative tasks had a low positive and insignificant correlation; competitive and individualistic tasks were uncorrelated; and cooperative and individualistic tasks had a significant negative correlation.

The results support the hypotheses that the competition and cooperation scales are essentially independent and that the competition and individualism scales are essentially independent. The cooperation and individualism scales had a moderate and significant correlation, but not high enough to be considered ends of the same continuum.

Hypothesis 2: Interrelationships of Social Interdependence Scales

Factor Analysis

Again both factor analytic and a priori interdependence scales were developed for competition, cooperation, and individualism. Several extraction and rotation procedures were used all of which gave essentially the same solution. A principal-components extraction method will be reported for an orthogonal and oblique rotation.

A varimax rotation procedure produced a five factor solution that accounted for 62% of the variance. Communalities ranged from .37 to .72 and were normally distributed throughout this range. The five factor solution contained two competition factors, two cooperation factors, and one individualism factor. Factor 3, one of the two competition factors, accounted for only 3% of the total variance, and Factor 5, one of the two cooperation factors, also accounted for only 3% of the total variance. Next, the items were forced to a three factor solution. The three factor solution produced a competition factor on which all competitive items loaded between .65 and .83; a cooperation factor on which all cooperation items loaded between .55 and .73 as well as two individualism items loading negatively (-.47, -.47); and an individualism factor on which 6 of 7 individualism items loaded between .59 and .79.

An oblimin rotation procedure produced a similar pattern of structural loadings. Again the five factor solution produced two competition factors, two cooperation factors, and one individualism

factor. A forced three factor solution produced a solution similar to the forced three factor oblimin solution. The three factor solution produced a competition factor with all competitive items loading between .65 and .83; a cooperation factor with all cooperation items loading between .52 and .74 as well as two individualism items loading (-.49, -.52); and an individualism factor with six of seven individualism items loading between .59 and .80. The orthogonal and oblique three factor solutions were nearly identical. Table 1 contains the three factor oblique solution and shows that competition and cooperation were uncorrelated, competition and individualism were uncorrelated, and cooperation and individualism had a low negative correlation ($r = -.16, p > .05$).

A Priori Scales

The a priori Social Interdependence Scales showed a similar pattern of relationships between competition, cooperation, and individualism as was found for the factor analytic solution. Table 1 shows that student ratings of competition and cooperation were independent, student ratings of competition and individualism were independent, and student ratings of cooperation and individualism were significantly and negatively correlated ($r = -.29, p < .01$). As in the case of the goal interdependence scales, the correlation between cooperation and individualism was not high enough to consider cooperation and individualism to lie on a continuum.

The results support the hypothesis that the SI competition and cooperation scales are uncorrelated, the competition and

individualism scales are uncorrelated, and the cooperation and individualism scales are significantly and negatively correlated.

Hypotheses 3 - 7: Sociability, Need for Social Comparison, Fear of Failure, and Helpfulness

Table 3 contains the correlations for sociability, need for social comparison, fear of failure, and helpfulness with the a priori goal and social interdependence scales. The correlations between the factor analytic scales and these variables were not included for two reasons: 1) the relationships between the factor analytic scales and the correlates were essentially the same as the relationships between the a priori scales and the correlates and, 2) the factor analytic scales weight all competitive, cooperative, and individualistic subscales and items for each factor scale, and therefore are not as conceptually pristine as the a priori scales.

Sociability

The hypotheses that sociability is positively correlated with cooperation and competition, more so with cooperation than competition, and uncorrelated with individualism were unsupported for the GI global scales. The GI cooperation scale was the only one of the three GI global scales that was significantly correlated with sociability ($r = .50, p < .01$). However, a different pattern of relationships emerged when the global scales were decomposed into their grade and task subscales, the results for the task subscales being

Table 3

Correlations of Sociability (S), Need for Social Comparison (SC), Fear of Failure (FF), and Helpfulness (H) with GI Scales, GI Subscales, and SI Scales

	S	SC	FF	H
GI Scales/Subscales				
Competition	.14	.36**	-.03	.00
grades	.08	.39**	.01	.00
tasks	.17*	.34**	-.05	.00
Cooperation	.50**	.20*	-.02	.58**
grades	.33**	.23**	.02	.39**
tasks	.57**	.14	.00	.64**
Individualism	-.13	-.15	-.01	-.26**
grades	.00	-.18*	-.03	-.09
tasks	-.22**	-.09	-.01	-.35**
SI Scales				
Competition	.18*	.37**	.04	.08
Cooperation	.40**	-.03	-.15	.69**
Individualism	-.36**	-.09	.05	-.50**

* $p < .05$. ** $p < .01$. Pairwise, two-tailed.

more supportive of these hypotheses. Sociability was significantly and positively correlated with cooperative grades (.33) and cooperative tasks (.57), although more highly correlated with cooperative tasks, t (141) = 4.64, $p < .01$. Additionally, sociability had a low positive, yet significant, correlation with competitive tasks ($r = .17$, $p < .05$) and a significant negative correlation with individualistic tasks ($r = -.22$, $p < .01$).

The SI scales produced a pattern of correlations with sociability similar to the GI task subscales pattern. Competition had a low, yet significant, positive correlation with sociability ($r = .18$, $p < .05$); cooperation had a significant positive correlation with sociability ($r = .40$, $p < .01$); and individualism had a significant negative correlation with sociability ($r = -.36$, $p < .01$).

Both the GI task subscales and SI scales showed the same pattern of correlations with sociability. Competition and cooperation were positively correlated with sociability, and cooperation was more highly correlated with sociability than competition, t (145) = 4.46, t (144) = 4.64, respectively; p 's < .01. Individualism was negatively correlated, not uncorrelated as predicted, with sociability.

The pattern of results for the GI cooperation subscale and SI cooperation scale confirm the hypothesis that cooperation is positively and significantly correlated with sociability. The pattern of results for the GI task subscales and SI scales also supported the hypothesis that sociability is more highly correlated with cooperation than competition, although the GI scales and GI grade subscale did not support this hypothesis. This conclusion needs further testing because the low, yet significant, correlation between sociability and

competitive tasks may be due to sample size. Unexpectedly, the GI individualism task subscale and SI individualism scale were significantly and negatively correlated with sociability.

Need for Social Comparison

The GI global scales displayed a different pattern of relationships with need for social comparison than did their decomposed grade and task subscales. The results for the global GI scales supported the hypotheses that competition and cooperation are positively correlated with the need for social comparison, that competition correlates more highly than cooperation with social comparison, t (141) = 2.12, $p < .05$, and that individualism is uncorrelated with social comparison (see Table 3). However, the grade and task subscales showed that competitive grades ($r = .39, p < .01$) and tasks ($r = .34, p < .01$) were both positively correlated with social comparison, but only cooperative ($r = .23, p < .01$) and individualistic ($r = -.18, p < .05$) grades, not tasks, were correlated with social comparison. This pattern of results suggests that the need for social comparison is activated whenever the outcomes of an activity are considered, regardless of the nature of the interdependency. However, this conclusion needs further investigation because the low, yet significant, negative correlation between individualistic grades and social comparison may be due to the large sample size. In contrast, only competitive tasks, which by their very nature require comparative information in order to perform the activity, seem to activate the need for social comparison. The only SI scale that was significantly correlated with

social comparison was the SI competition scale ($r = .37, p < .01$). The same pattern of correlations found between the SI scales and sociability were also found between the SI scales and social comparison. That is, the SI scales displayed the same pattern of correlations with sociability and social comparison that was found between the GI task subscales and sociability and social comparison.

Fear of Failure

None of the goal interdependence or social interdependence scales were significantly correlated with fear of failure. Fear of failure was significantly correlated with only one variable in this study, the need for social comparison ($r = .22, p < .01$).

Helping

The results for the global goal interdependence (GI) scales supported the hypotheses that competition is uncorrelated with helpfulness; that cooperation is positively and significantly correlated with helpfulness; but did not support the hypothesis that individualism is uncorrelated with helpfulness. Instead, individualism was negatively and significantly correlated with helpfulness ($r = -.26, p < .01$). The GI grade and task subscales displayed a different pattern of correlations with helpfulness (see Table 3). As predicted, the competitive grade and task subscales were uncorrelated with helpfulness, and the cooperative grade and task subscales were positively and significantly correlated with helpfulness

(r = .39, r = .64, respectively; p 's < .01). However, the individualistic grade subscale was uncorrelated with helpfulness, whereas the individualistic task subscale had a significant negative correlation with helpfulness (r = -.35, p < .01).

The SI scales produced the same pattern of correlations with helpfulness that was found for the GI task subscales. That is, competition was uncorrelated with helpfulness, cooperation had a strong positive correlation with helpfulness (r = .69, p < .01), and individualism had a strong negative correlation with helpfulness (r = -.50, p < .01).

The similarity of the SI scale results for sociability, need for social comparison, and helpfulness strongly suggest that the SI scales measure social interdependent tasks and not grades. However the hypothesis that the SI cooperation scale is not a cooperation scale, but instead a helpfulness scale remains unanswered. In order to test this hypothesis, partial correlations between the SI cooperation scale and the GI cooperation scale and subscales, controlling for helping, were examined. Table 4 shows that all zero-order correlations between the SI cooperation scale and the three GI cooperation scales were significant. However, the partial correlation coefficients were all insignificant when the effects of helpfulness were controlled. This result strongly suggests that the SI cooperation scale is a measure of helpfulness, not cooperation. Further evidence to collaborate or refute this conclusion will be found in the vignette data.

Table 4

Partial Correlations between the GI Cooperation Scale and Subscales with the SI Cooperation Scale while Controlling for the Effects of Helping

	SI Cooperation Scale	
	Zero-Order Coefficients	First-Order Coefficients
GI Cooperation Scale	.41**	.02
grade subscale	.29**	.02
task subscale	.45**	.00

* $p < .05$. ** $p < .01$. Pairwise, two-tailed

Hypotheses 8 - 10: GI and SI Scales Predictions of Vignettes

Global Ratings of the Vignettes

Subjects were required to rate how much they liked each of the vignettes as a whole. Of the eight vignettes, two were constructed to contrast student ratings of competitive classroom structures that allow students to help one another with competitive classroom structures that do not allow student helping. On average, students rated the competitive vignette that allowed helping, that is competitive activities designed for the purpose of preparing one another for an exam, more favorably than the competitive vignette in which competitive activities were performed to determine grade assignments, t (149) = 11.27; p <.01. The mean score for the competitive vignette that allowed students to help one another was

4.18, s.d., 1.35 and the mean score for the competitive vignette that did not allow students to help one another was 2.90, s.d., 1.12.

Table 5 shows that both the GI competition scale and the competition grade and task subscales predicted student ratings of both competitive vignettes; however, they were better able to predict student ratings of the competitive vignette containing both competitive grades and tasks than the competitive vignette containing competitive tasks only, t (142) = 2.91, $p < .01$; t (143) = 2.04, $p < .05$; t (146) = 3.55, $p < .01$; respectively. The SI competition scale predicted student ratings of the competitive vignette containing competitive grades and tasks, and although the SI competition scale was able to predict student ratings of the competitive vignette containing competitive tasks only, it accounted for less than 5% of the total variance.

Two cooperative vignettes were constructed to contrast cooperative classroom structures that allow students to help and socialize with one another with cooperative classroom structures that do not allow students to help and socialize with one another. On average, students rated the cooperative vignette that allowed students to help and socialize with one another, that is a group discussion concerning how to answer a common problem, more favorably than the cooperative vignette that did not allow student discussions about how to solve a problem, t (148) = 3.91; $p < .01$. The mean score for the cooperative vignette that allowed students to help one another was 3.70, s.d., 1.03 and the mean score for the cooperative vignette that did not allow students to help one another was 3.19, s.d., 1.21. Table 5 shows that both the GI cooperation scale and cooperation grade and

Table 5

Correlations between Student Global Ratings of Each Vignette with Student Ratings of GI Scales, GI Subscales, and SI Scales

	Vignettes							
	PN1	PH5	CN3	CH7	IN2	IH4	CH6	MX8
GI Scales								
Competition	.50**	.27**	.08	.20*	-.11	.07	.04	.28**
grade	.42**	.25**	.09	.18*	-.10	.07	.07	.27**
task	.53**	.25**	.08	.23**	-.13	.05	.04	.28**
Cooperation	.09	.14	.26**	.30**	-.39**	-.04	.46**	.34**
grade	.11	.11	.31**	.31**	-.25**	-.05	.38**	.31**
task	.06	.15	.20*	.26**	-.43**	-.02	.45**	.32**
Individualism	-.12	.09	-.27**	-.26**	.47**	.11	-.23**	-.25**
grade	-.18*	.04	-.21*	-.23**	.37**	.07	-.16	-.19*
task	-.05	.09	-.25**	-.23**	.46**	.13	-.24**	-.26**
SI Scales								
Competition	.36**	.18*	-.01	.18*	.06	.03	.03	.11
Cooperation	-.08	.13	-.02	.06	-.08	.01	.18*	.01
Individualism	-.04	.00	-.21*	-.09	.33**	.19*	-.39**	-.14

Note. Competition without Help (PN1), Competition with Help (PH5), Cooperation without Help (CN3), Cooperation with Help (CH7), Individualism without Help (IN2), Individualism with Help (IH4), Cooperation with Help (CH6), Mixed (MX8).

* $p < .05$. ** $p < .01$. Pairwise, two-tailed

task subscales predicted student ratings of both of these cooperative vignettes. However, the SI cooperation scale did not predict student attitudes toward either of these cooperative vignettes. Interestingly, the GI individualism scale and subscales predicted both cooperative vignettes.

The results from the cooperation vignettes confirmed the hypothesis that the SI cooperation scale would be unable to predict student ratings of cooperative classroom situations that are devoid of helping and social interaction. A second, and more sensitive measure, of cooperative tasks that are devoid of helping and socialization was calculated by adding together student ratings of the cooperative tasks only. The global rating of the vignette was a summary measure of student attitudes toward all aspects of the vignette, not just the cooperative tasks. Again, the results showed that the GI cooperation scale and cooperation grade and task subscales were strongly correlated with student ratings of cooperative tasks that were devoid of helping and socializing ($r = .57, r = .48, r = .56$, respectively; all p 's $< .01$), whereas the SI cooperation scale was not significantly correlated with this more sensitive measure ($r = .14, p > .05$).

The second part of this hypothesis, that the SI cooperation scale would predict cooperative classroom situations that allow helping and socializing, was similarly analyzed. Again, a more sensitive measure of cooperative tasks was calculated by adding together student ratings of cooperative tasks only. Again the results show that the GI cooperation scale and cooperation grade and task subscales were strongly correlated with cooperative tasks that allow students to help and socialize with one another ($r = .66, r = .55, r = .66$, respectively; all

p 's < .01). The results also showed that the SI cooperation scale was positively correlated with cooperative tasks that allow students to help each other and socialize (r = .26, p < .01), which was in contrast to the results of the global ratings of this vignette.

Vignette 6 was an additional cooperative vignette that required students to help one another complete an assignment by doing such things as helping one another organize a paper, and discussing where to find references and how to improve each otners' sections of a cooperative paper. Both the GI cooperation scale and cooperation grade and task subscales predicted student ratings of this vignette (r = .46, .38, .45 respectively, all p 's < .01), whereas the SI cooperation scale, although predicting student ratings of this vignette (r = .18, p < .05), accounted for very little of the variance. Additionally, the GI and SI individualism scales and the GI individualism task subscale had significant negative correlations with student ratings of this cooperative vignette, similar to the findings of the cooperative vignettes discussed earlier.

Two individualistic vignettes were constructed to contrast individualistic classroom structures that required students to help one another with individualistic classroom structures that did not allow students to help one another. There was no significant differences between student ratings of these vignettes, t (145) = .48; p > .5. However, the individualistic vignette that did not allow students to help one another was predicted by the GI and SI individualism scales and the GI individualism grade and task subscales (r = .47, .33, .37, .46, respectively; all p 's < .01). In addition, the GI cooperation scale and cooperation grade and task subscales also predicted student ratings of

the individualism vignette that did not allow helping (r = -.39, -.25, -.43, respectively, all p 's < .01).

The individualism vignette that allowed students to help one another was uncorrelated with all GI individualism scales. The SI individualism scale did predict student ratings of this vignette, and, although significant, the correlation coefficient was low (r = .19, p < .05) and possibly a function of sample size.

A more sensitive individualism task score was calculated for each individualism vignette to test the hypothesis that the SI individualism scale would not predict student ratings of individualistic tasks that allow students to help one another, but would predict individualistic tasks that do not allow students to help one another. The results showed that both the GI individualism scale and grade and task subscales predicted both the helping (r = .48, r = 39, r = .45, respectively; all p 's < .01) and no helping (r = .46, r = .38, r = .43, respectively; all p 's < .01) individualism task scores. The SI individualism scale predicted the vignette individualism task measures for helping and no helping conditions (r = .32, r = .36, respectively; all p 's < .01). Thus the hypotheses that the SI individualism scale would not predict student ratings of individualistic tasks that structure helping is not supported.

The last vignette (Vignette 8) was a mixture of competitive grades and tasks, cooperative grades and tasks, and individualistic grades. Table 5 shows that all GI competition and cooperation scales and subscales were positively correlated with students ratings of this vignette and all GI individualistic scales and subscales were negatively correlated with student ratings of this vignette. However, none of the

SI scales were significantly correlated with student ratings of this vignette.

Cumulative Measures of Grade and Task Interdependence Conditions and Helping from the Vignettes

In order to determine the predictive abilities of GI and SI scales and subscales seven cumulative measures of competitive, cooperative, and individualistic grades and tasks were calculated from the vignette items. The cumulative measures were calculated by combining student ratings of all similar interdependence conditions to form total rating scores. For example, all items in the eight vignettes that measured competitive grades were combined to form a cumulative rating of competitive grades. The same was done for competitive tasks, cooperative grades and tasks, individualistic grades and tasks, and for a cooperative measure of student willingness to rely on one another to obtain information they needed to complete a cooperative task. The number of items combined as part of the cumulative measures were: competitive grades, four items; competitive tasks, six items; cooperative grades, 10 items; cooperative tasks, 20 items; cooperative reliance, six items; individualistic grades, 10 items; and individualistic tasks, 14 items. These measures included student ratings of how much they liked these various aspects of different vignettes as well as how motivating they found them to be.

All correlation coefficients between competitive, cooperative, and individualistic scales and subscales with cumulative scores are contained in Table 6. The competitive grade and task cumulative

scores were strongly predicted by the GI and SI competition scales and GI competition subscales. Although the GI scales and subscales had slightly higher correlations with the competitive cumulative scores than did the SI scale, all correlation coefficients were .50 or above. The only other scales that predicted the competition cumulative scores were the GI cooperation scale and cooperation subscales, which predicted the competitive task cumulative score. Their correlation coefficients were considerably smaller than the competition scales and accounted for very little of the total variance (< 5%).

Tables 6 and 7 show that the cooperative grade, task, and reliance cumulative scores were strongly predicted by the GI cooperation scale and cooperation subscales (all coefficients > .43), and they continued to predict the cumulative scores when the effects of helping were partialled out (all partial correlation coefficients > .45). The SI cooperation scale predicted the cooperative task cumulative score only ($r = .27, p < .01$), but did not predict this cumulative score when the effects of helping were partialled out ($r = .00, p > .5$). This result provides further evidence suggesting that the SI cooperation scale is largely a measure of helpfulness.

The GI individualism scale and subscales predicted the cooperation cumulative scores, but the correlation coefficients were much smaller than the coefficients for the GI cooperation scales (coefficients between -.21 to -.40). Interestingly, the SI individualism scale had significant negative correlations with the cooperation grade, task, and reliance cumulative scores ($r = -.34, r = -.53, r = -.41$, respectively; all p 's < .01), although the SI cooperation scale was unrelated to these scores.

Table 6

Correlations of GI and SI Scales with Student Cumulative Rating Scores of Goal Interdependence Structures from the Vignettes

	Cumulative Scores						
	Competition		Cooperation			Individualism	
	grades	tasks	grades	tasks	rely	grades	tasks
GI Scales							
Competition	.64**	.67**	.25**	.13	.13	.14	.05
grades	.55**	.57**	.26**	.15	.14	.11	.00
tasks	.67**	.69**	.28**	.14	.13	.17*	.11
Cooperation	.13	.21*	.48**	.72**	.59**	-.20*	-.30**
grades	.11	.17*	.47**	.58**	.49**	-.17*	-.18*
tasks	.13	.21*	.43**	.73**	.59**	-.19*	-.36**
Individualism	.00	-.04	-.30**	-.32**	-.35**	.60**	.61**
grades	-.04	-.07	-.24**	-.15	-.21*	.55**	.44**
tasks	.00	-.02	-.30**	-.39**	-.40**	.51**	.62**
SI Scales							
Competition	.52**	.50**	.13	.08	.00	.23**	.08
Cooperation	-.05	.01	.10	.28**	.13	.00	-.03
Individualism	-.08	-.09	-.34**	-.53**	-.41**	.22**	.47**

* $p < .05$. ** $p < .01$. Pairwise two-tailed

Table 7

Partial Correlations of GI and SI Scales with Student Cumulative Rating Scores of Cooperative and Individualistic Vignette Structures while Controlling for the Effects of Helping

	Cumulative Scores				
	Cooperation			Individualism	
	grades	tasks	rely	grades	tasks
GI Scales					
Cooperation	.46**	.63**	.54**	-.19*	-.28**
grades	.46**	.51**	.45**	-.12	-.09
tasks	.45**	.66**	.56**	-.12	-.26**
Ind	-.33**	-.28**	-.33**	.59**	.59**
grades	-.24**	-.14	-.20*	.55**	.42**
tasks	-.28**	-.29**	-.34**	.50**	.60**
SI Scales					
Cooperation	.01	.00	.05	.14	.18
Individualism	-.33**	-.41**	-.34**	.16	.41**

* $p < .05$. ** $p < .01$. Pairwise two-tailed.

The individualistic grade and task cumulative scores were strongly predicted by the GI individualism scale and subscales (all coefficients > .44). The GI individualism scale and individualism subscales continued to predict the individualistic cumulative scores when the effects of helping were controlled (all partial correlation coefficients > .42). The SI individualism scale predicted the individualism grade and task cumulative scores (r = .22, r = .47, respectively, p 's < .01), but failed to predict the individualism grade score when the effects of helping were controlled (see Table 7).

A six-item cumulative helping measure was calculated from several vignettes. The helping scale predicted the helping cumulative measure (r = .44, p = .000), as did the GI cooperation scale and GI grade and task subscales (r = .36, r = .26, r = .39, respectively; all p 's < .01). Both the SI cooperation and individualism scales were significantly correlated with the helping measure (r = .35, r = -.26, respectively; all p 's < .01).

CHAPTER 5

DISCUSSION

The purpose of this dissertation is to contrast the goal interdependence and the social interdependence characterizations of competition, cooperation, and individualism by examining their interrelationships, their relationships with theoretical correlates, and their predictive abilities. It was hypothesized that the Social Interdependence Scales (Johnson & Norem-Hebeisen, 1979) misrepresent the concept of cooperation and confound individualism with the concept of working alone. As a result of this misrepresentation and confound, the pattern of SI scale intercorrelations, relationships with their correlates, and predictions of student attitudes toward vignette descriptions was expected to differ substantially from the pattern of results for the goal interdependence scales. In addition, all three types of analyses (intercorrelations, correlations, and predictions) were expected to show that the Social Interdependence Scales characterize competition, cooperation, and individualism as task interdependencies and not grade interdependencies, with the exception of the competition scale.

Several hypotheses were proposed that tested for differences between the goal and social interdependence scales. Most of the hypotheses were confirmed.

Comparison of Goal and Social Interdependence Scales

The data strongly support the hypothesis that the GI and SI competition scales measure essentially the same content. The relationships of these scales to each other and correlates, and their predictions of the vignette data were almost identical. The only difference between the two scales was that the GI competition scale was more highly correlated than the SI competition scale with cumulative measures of competitive grades, t (144) = 2.94, $p < .01$, and tasks, t (144) = 3.66; $p < .01$, in the vignette data.

The data strongly support the hypothesis that the SI cooperation scale is a measure of helpfulness and not cooperation. Support for this hypothesis was clearly shown by its high correlation with helpfulness and moderate correlation with the GI cooperation scales, by its near zero partial correlations with the GI cooperation scales and subscales when the effects of helping were controlled, by its inability to predict student global ratings of the cooperative vignettes or the student cumulative rating scores for cooperative grades or reliance, and by its inability to predict student cumulative rating scores for cooperative tasks when the effects of helping were controlled. Although the SI cooperation scale did predict a cumulative measure of cooperative tasks, the predictions of this cumulative measure by the GI cooperation scale was significantly better, t (144) = 6.98, $p < .01$.

The GI and SI individualism scales showed essentially the same results. The only difference between these scales was that the SI individualism scale prediction of the cumulative measure of

individualistic grades in the vignette data accounted for very little of the shared variance (< 5%) and was significantly worse than the GI individualism scale prediction, t (144) = 14.93, p < .01.

These data suggest that the SI scales are inappropriate for examining person-environment fit theories for cooperation and individualism. The SI cooperation scale is a measure of helpfulness and not promotive goal interdependence, and therefore has less power to examine person-environment fit in cooperative conditions than do goal interdependence scales. In addition, the SI scales either do not predict student ratings of interdependent grades or do so less well than their GI counterparts. The correlation data showed that the SI scales and GI task subscales had remarkably similar patterns of results for sociability, need for social comparison, and helpfulness which further supports the finding that the SI scales measure behavioral relationships (processes) and not outcome relationships (products). The SI scales are limited in person-environment studies not only by misrepresenting helpfulness as cooperation, but also by failing to measure student attitudes toward cooperative and individualistic grades.

These findings suggest that research on cooperative learning methods that mix cooperation and helping structures may be basing conclusions on the results of cooperative helping situations, not cooperative situations. There is a growing interest within cooperative learning research to experimentally test for the effects of individual components of various learning methods (Sharan, 1980; Slavin, 1980, 1990; Okebukola, 1986). However, no one has suggested isolating the effects of helping from the effects of cooperation. The effects of

helpfulness in cooperative situations may account for the findings in some studies that cooperation fosters interpersonal attraction, self-esteem, social support, prosocial behavior, and psychological health (Graves & Graves, 1985; Johnson & Johnson, 1989; Kagan, 1985; Sharan, 1980, Slavin, 1980). These conclusions are often based on studies that contrast cooperative with competitive situations and must be viewed skeptically to the extent that cooperation and helpfulness are mixed in cooperative conditions.

A general conclusion for the comparison of the GI and SI scales is that the SI scales do not measure cooperation, and the cooperation and individualism scales do not measure student attitudes toward grade interdependence conditions.

Interrelationships of Competition, Cooperation, and Individualism

The results strongly suggest that competition and cooperation are essentially independent concepts. It should be noted that any reference to cooperation and its relationships with other variables refers to the GI cooperation scale and not the SI cooperation scale. Independence, as applied here, means that student ratings of competition provide little information about how students rate cooperation; and therefore, that competition and cooperation do not represent opposite ends of a continuum. The results definitely do not support the hypothesis that competition and cooperation are inversely related as has been suggested in previous research (Deutsch, 1949a, 1973, 1982; Pepitone, 1980). Deutsch and Pepitone have suggested that a prosocial continuum separates people's perceptions of competitive

and cooperative situations. When the effects of the prosocial continuum are removed, as was done in the GI attitudinal scales, the relationship between competition and cooperation is not negative. In fact, the data consistently show, across factor analytic scales, a priori scales, correlation data, and predictions of the vignette data, that the relationship is a low positive one. The shared variance was consistently around 5%.

Because the items measuring competition and cooperation adhere strictly to goal interdependence theories, it is likely that the positive relationship between competition and cooperation results from their characterizations as goal interdependence conditions. Although both conditions require people to rely on one other for their outcomes or to complete a task, the nature of their interdependence, positive versus negative, is dissimilar and therefore likely to keep the correlation low. It is likely, although it was not specifically tested, that the relationship between competition and cooperation would become negative as their characterizations include items representing bipolar contrasts such as the rivalry-helpfulness prosocial continuum.

The SI scales confused cooperation with helpfulness, one end of the prosocial continuum, but did not confound competition with rivalry, the other end of the prosocial continuum. And again, no relationship was found between competition and cooperation (helpfulness).

The pattern of results for the GI grade and task subscales further support the conclusion that competition and cooperation are essentially independent and that they have a low positive correlation. Although the relationship is low and positive for grade and task

subscales, the relationship is positive and statistically significant for grades. There are no data or theories which suggest a reason why competition and cooperation may be perceived by students to be significantly related in grade interdependence conditions, although it may be simply that students perceive their need to rely on others strongly in grade interdependence conditions.

The low positive relationship between competition and cooperation is seen in their interrelationships in the factor analytic and a priori data, their relationships with correlates such as sociability, need for social comparison, and helpfulness, and in the vignette data. The best illustration of the low positive relationship between competition and cooperation is found in vignette #8 where competitive, cooperative, and individualistic grades and tasks were combined into a complex classroom structure. The most salient aspect of this vignette is goal interdependence which is characterized by competition and cooperation. The GI competition and cooperation scales were significantly and positively correlated with student ratings of this vignette, whereas the GI individualism scale was significantly and negatively correlated with student ratings.

The data consistently show that competition and individualism are independent concepts. The correlation of competition and individualism was virtually zero across the entire data. This relationship exists despite the possibility that students could have contrasted competition and individualism along a goal interdependence continuum (that is, the presence versus absence of goal interdependence). This conclusion holds true whether individualism is characterized as a condition of no interdependence as

found in the GI individualism scale, or whether individualism is characterized as a condition of working alone versus in groups as found in the SI individualism scale.

The relationship between competition and individualism when characterized as task interdependencies is the same as their relationship when characterized as global measures. The factor analytic, a priori, and vignette data all show the GI global scales and task subscales of competition and individualism are unrelated. However, the relationship between competition and individualism when characterized as grade interdependence differs from the global and grade relationships. Although the results support the conclusion that competition and individualism are essentially independent (shared variance < 5%), the relationship between competitive and individualistic grades is significant and negative. There are no data or theories to suggest why competitive and individualistic grades are significantly related. However, the competition and cooperation results also showed a significant relationship between grade subscales. Again, it may be that students are highly sensitive to the presence-absence contrast of goal interdependence in grade interdependence characterizations. The data for the competition-cooperation relationship and the competition-individualism relationship provide some support for the hypothesis that relationships between concepts will vary depending on how goal interdependence is created. However, the correlational data strongly support this hypothesis.

The data also suggest that if the characterization of competition had included components of sociability as suggested by some researchers (Deutsch, 1982; Johnson & Norem-Hebeisen, 1979;

Pepitone, 1980), or rivalry as suggested by others (Kagan, 1977), the relationship between competition and individualism would likely have changed. For example, the correlational data showed that the competition task subscale was positively and significantly correlated with sociability, whereas the individualism task subscale was negatively and significantly correlated with sociability. If the characterization of competition included components of sociability, competition and individualism may have been more negatively related. In contrast, the individualism task subscale was significantly and negatively correlated with helpfulness. If the characterization of competition included components of rivalry, competition and individualism may have been more positively related. It appears that confounding the characteristics of one concept with the characteristics of highly correlated yet conceptually distinct concepts may change its pattern of relationships with other variables.

The relationship between cooperation and individualism was not as expected, although the inverse relationship is not strong enough to consider cooperation and individualism to be a continuum. The results in this study for the GI and SI scales are consistent with the results of the Johnson and Norem-Hebeisen (1979) and Owens and Straton (1980) studies which showed cooperation and individualism are moderately correlated. However, these previous studies measured cooperation as a preference for helping others or group work, and were based largely on samples of students from primary and secondary schools. The Johnson and Norem-Hebeisen (1979) study also sampled college students and found that cooperation and individualism were highly correlated ($r = -.60, p < .01$).

The pattern of results for cooperation and individualism are clear and consistent. The same pattern exists for the factor analytic scales, the a priori scales and subscales, the correlate data, and the vignette data. Cooperation and individualism are significantly and negatively correlated. Because this result was unexpected, no specific hypotheses were tested that might explain this relationship. However, a post hoc and speculative analysis of the correlation data does suggest a possible way to untangle this relationship that might be tested in future studies.

The relationships of the cooperation subscales with need for social comparison, sociability, and helpfulness differ significantly from the relationships of the individualism subscales with these correlates. For example, student ratings of cooperative tasks are strongly and positively correlated with sociability, whereas student ratings of individualistic tasks are significantly and negatively correlated with sociability. Second, student ratings of cooperative grades are positively and significantly correlated with ratings of need for social comparison, whereas student ratings of individualistic grades are negatively and significantly correlated with need for social comparison. Finally, student ratings of cooperative tasks are strongly and positively correlated with ratings of helpfulness, whereas student ratings of individualistic tasks are moderately and negatively correlated with ratings of helpfulness. In each case, the relationship of cooperation with these variables is in the opposite direction of the relationship of individualism with them.

In order to understand how cooperation and individualism might be related, an analysis of the common structure of these variables

might prove useful. The act of socially comparing one's own outcomes to the outcomes of others requires not only an awareness of others but acknowledgement that others have utility value. That is, others are perceived to be a referent or point of comparison that allows one to make sense of one's own outcomes. This comparison is believed to reflect the individuals desire to understand his or her own outcomes by gathering additional information about outcome range, variability, mean, and so forth (Dakin & Arrowood, 1981; Festinger, 1954; Radloff, 1966; Singer, 1966; Thornton & Arrowood, 1966). The perceived connectedness between individuals who socially compare outcomes may be best described as indirect contact through relational thought.

Sociability goes beyond awareness of others as a referent to a desire for direct contact. This too can be viewed as instrumental because it serves other needs such as excitement, companionship, self-esteem, and so forth. The nature of contact between individuals was not specified in the items that measured the desire for interacting with others. Helpfulness refers to direct social contact with others, but goes beyond general social interaction to specify a particular kind of interaction, one in which people help each other. The connection of self to other involves more intimate contact between individuals, as at first, one person helps the other, the person who has received help feels obligated to reciprocate, and comparative indeterminance causes the relationship to continue in the future to other situations (Gouldner, 1960).

One dimension that appears to underlie need for social comparison, sociability, and helpfulness is intimacy in relationships.

Each of these variables seems to represent a different level of intimate contact between individuals. This brings two questions to mind: 1) How do intimacy and goal interdependence differ? and 2) Is intimacy a dimension along which students perceive cooperation and individualism to differ? Goal interdependence refers to perceived relationships between the goals of individuals; cooperation, a positive correlation between goals, and individualism, a zero correlation between goals. Intimacy, in contrast, refers to the nature of the relationships between individuals on a personal level. This analysis suggests that goal interdependence is a structural or situational orientation whereas intimacy is a relationship orientation.

If the second question is true, one would expect that as intimacy increases from one level of intimate interaction to another, so should the difference between the correlations of cooperation and individualism. That is, the difference score between cooperation's correlation with helpfulness and individualism's correlation with helpfulness should be greater than the difference between cooperation's correlation with sociability and individualism's correlation with sociability, which should be greater than their difference score for need for social comparison.

Figure 4 graphs the correlations of cooperation and individualism with need for social comparison, sociability, and helpfulness and shows a possible trend that individualism becomes more negatively correlated with intimacy as intimacy increases (assuming that social comparison, sociability, and helpfulness represent different levels of intimacy). In contrast, cooperation appears to become more positively correlated with intimacy as intimacy increases. However, this study

did not propose to systematically test this hypothesis and unfortunately the intervals between social comparison, sociability, and helpfulness are not known and unlikely to be equal. Therefore, it is not possible to test whether the slopes of these lines are significantly different from zero.

Figure 5 graphs the difference scores for cooperation and individualism at each assumed level of intimacy. The difference in correlations between the correlations of cooperation and individualism with social comparison, sociability, and helpfulness are significant, t (145) = 3.02, t (142) = 6.47, t (141) = 8.77, respectively; all p 's < .01. This analysis is highly speculative and post hoc, but it does suggest that a simple study which systematically examines the relationships of individualism and cooperation at various levels of intimacy might shed new light on the relationship between cooperation and individualism.

A general conclusion for the data on the interrelationships among student attitudes toward goal interdependence conditions is that competition and cooperation are essentially independent concepts as are competition and individualism. Cooperation and individualism are correlated, non-independent concepts; however, the relationship is not strong enough to consider them to be polar opposites. Future studies should test for differential relationships of cooperation and individualism with other variables such as intimacy.

Correlation Data

The pattern of the correlation data suggest that how one

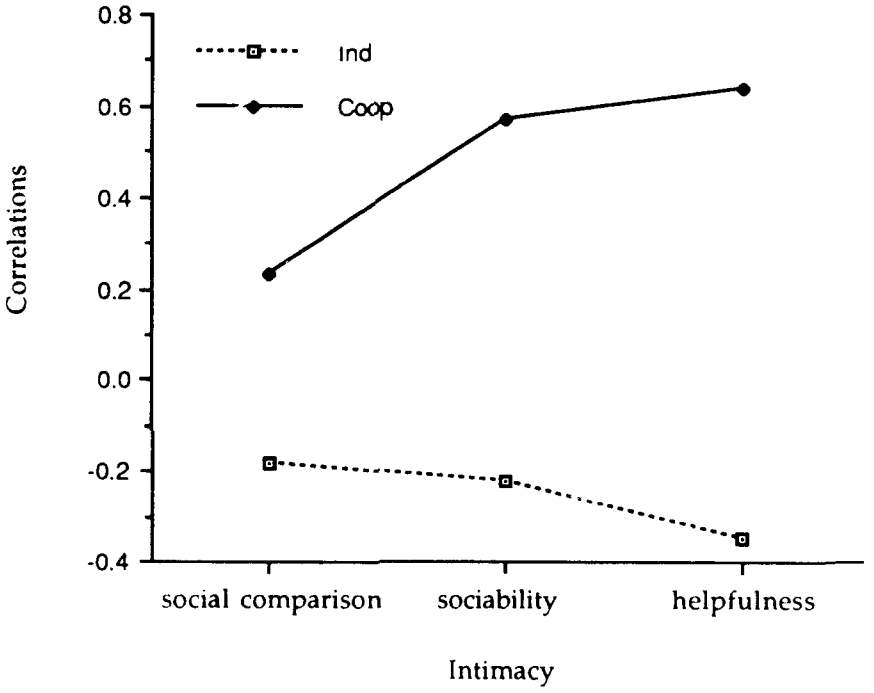

Figure 4. Correlations of Cooperation and Individualism with Intimacy.

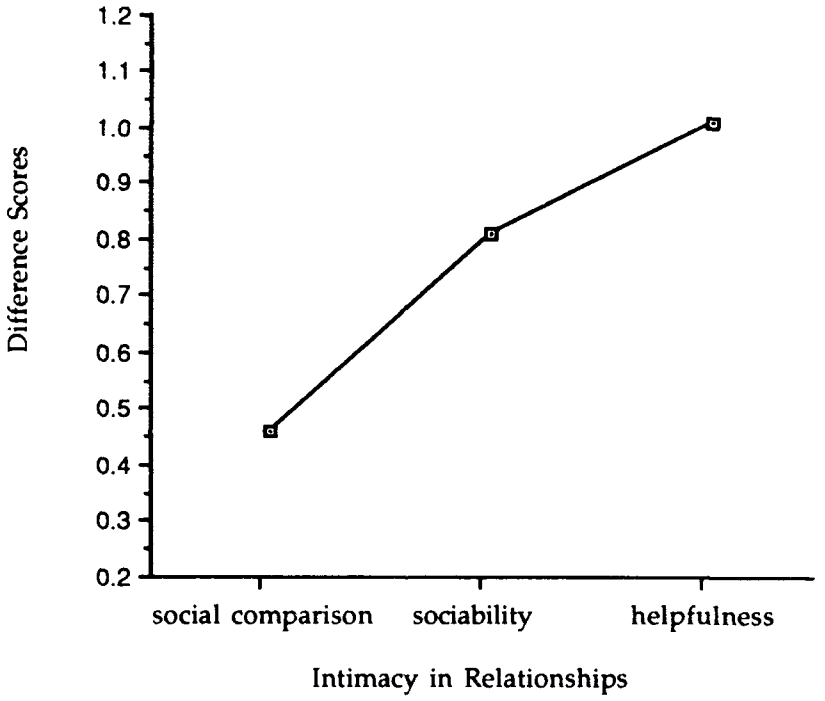

Figure 5. Difference Scores between Correlations of Cooperation and Individualism with Intimacy.

characterizes a concept may determine the relationships it has with other variables. The GI global scales, GI grade subscales, GI task subscales, and SI scales had different patterns of relationships with need for social comparison, sociability, and helpfulness. The grade (product) and task (process) interdependence scales provided a clearer and more understandable picture of the relationships between student attitudes of goal interdependence conditions and their correlates than did the global scales. For example, sociability is a task related variable that was significantly correlated with only one GI global scale and one GI grade subscale, cooperation. However, the GI task subscales showed that competition, cooperation, and individualism were all significantly correlated with sociability. Characterizing dependent and independent variables along similar dimensions increases the power of analysis (Ajzen & Fishbein, 1977; Magnusson, 1988). The importance of characterizing variables at the same level of specificity and using similar dimensions can not be overstated.

Goal interdependence situations, like most situations, are a complex array of different structures, people, intentions, perceptions, and so forth that are highly interactive and dynamic so that each aspect of the situation influences and is influenced by all other aspects (Deutsch, 1982; Magnusson, 1988). Among these complex interrelationships exist many different ways of structuring competition, cooperation, and individualism. This study suggests that external stimuli, perceptions of those stimuli, and behavioral intentions all interact dynamically to create subjective experience. Other contexts such as personal relationships, business, athletics, and politics are likely to have unique aspects that change the nature of goal

interdependence relationships. Therefore, global and contextless measures of goal interdependence, such as mixed-motive measures, are not likely to generalize well across situations because they represent a mismatch of underlying dimensions and are insensitive to situational nuances.

The social comparison data support an earlier finding (Liebrand & McClintock, 1988) and theories suggesting that cooperative outcomes (grades) elicit a need to compare one's own outcomes with the outcomes of others (Kagan, 1977; Deutsch, 1982). It is believed that cooperative comparisons help one to decide if an interaction has been fair using various rules such as equity, equality, group enhancement, or need . This finding also suggests that previous studies that found competitive behaviors to increase as the amount of socially comparative information available to subjects increases (McClintock & McNeel, 1966; McClintock & Messick, 1966; McNeel, Sweeney, & Bohlin, 1974) should expand future studies to include the systematic testing of different purposes for comparison.

The results also suggest that social comparison is an integral part of competitive activities, which by their very nature require comparative information to perform the activity, but is not integral to cooperative or individualistic activities.

The fear of failure data are rather confusing. The inability of the fear of failure instrument to predict student attitudes toward competition may be explained by several reasons, three of which are: 1) fear of failure and competition are unrelated, 2) self-report instruments are unable to measure the true feelings of a subject towards variables that cause him or her to experience anxiety, or 3)

college represents a challenging environment to which persons who are fearful of failure would not subject themselves. Each of these explanations are equally plausible, and currently there are no data to suggest that one explanation is more accurate than the others.

One of the most interesting findings for the helpfulness data is that student attitudes toward competition and helpfulness are unrelated. This finding was consistently seen throughout the data, including the factor analytic data, the a priori data, and the helpfulness cumulative score in the vignette data. Much of the previous research has compared the amount of helping found in cooperative and competitive situations (DeVries & Edwards, 1974; DeVries, Edwards & Slavin, 1978; Johnson & Johnson, 1982b; Weigel, Wiser & Cook, 1975). The data consistently show that people are more helpful in cooperative than in competitive situations. This strategy has failed to examine competitive conditions that might increase helping behaviors like those suggested in studies of cooperative competition (Sherif, Harvey, White, Hood & Sherif, 1988; Slavin, 1978a, 1978b). As both May and Doob (1937) and Mead (1937) suggest, the intention of competitive activities is not necessarily to obstruct the efforts of others to achieve, to reduce helping and sharing, or to increase antisocial tendencies as found in other studies (Barnett & Bryan, 1974; Berkowitz, 1972; Miller & Hamblin, 1963; Rausch, 1965). Situations can be structured so that the primary goal of competitive activities is to encourage individuals to help one another. Competition can be structured so that ingroup members help one another prepare for outgroup competition as is found in the Teams-Games-Tournament cooperative learning method (Slavin, 1978a), or so that the

competitive activity itself is perceived to help people sharpen their skills for a future activity as is found in intra-squad scrimmages for a sports team.

A general conclusion for the correlation data is that the relationships researchers discover between variables depends largely on how they characterize the variables.

General Discussion

A central concern of educators studying the effects of goal interdependence conditions in educational settings is how to improve student academic achievement. Two approaches have been used to study this relationship: 1) determine which goal interdependent conditions enhance student performance for each type of academic materials (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Miller & Hamblin, 1963; Sharan, 1980, 1990; Slavin, 1980, 1990), and 2) determine whether matching a student's preferred and actual studying conditions enhances academic achievement (Cohen, 1982, 1984; Feather, 1982, 1988; Okebukola, 1986; Okebukola & Ogunniyi, 1984; Widaman & Kagan, 1987; Zahn, Kagan & Widaman, 1986). Earlier research suggested that behavior alone does not provide enough information to assess whether individuals are acting competitively, cooperatively, or individualistically (May & Doob, 1937; Mead, 1937). It was assumed that the actor's intentions were more important for this determination than were his or her behaviors. This interpretation suggests that educators can structure various goal interdependence conditions and then manipulate student perceptions of these

structures by stating different purposes for the structures. This study tested such a manipulation.

Two vignettes were designed to contrast different competitive activities. In one condition, students competed with one another for points and the points were used to assign grades. In this case, competitive activities were instrumental to competitive grades. In the second condition, students competed with one another not for points which were used to assign grades, but instead as a means of preparing everyone for a test on the material. In the second condition, competitive activities were instrumental to preparing everyone for a test. Students were very sensitive to these structured intentional differences and rated the second condition far more favorably than the first. The competitive behaviors in these conditions were described identically, and yet these identical behaviors took on different meanings for students depending on the stated purpose of the activities.

This result has potential value for educators. It suggests that educators are not limited to improving student performance by either matching study materials with the goal interdependence condition that best enhances student performance or by matching student preferred and actual studying conditions. Instead both of these conditions can be met by structuring the goal interdependence condition that improves student performance most, and then describing the intention of the activity so that it matches student preferences. This hypothesis needs to be tested under conditions other than competitive goal interdependence.

It must be noted that the results of this study may or may not be found to generalize beyond college samples. The interrelationships of competition, cooperation, and individualism and their relationships with their theoretical correlates is not known for students in primary and secondary schools. The Social Interdependence Scales (Johnson & Norem-Hebeisen, 1979) and the Learning Preference Scales for Students (Owens & Straton, 1980) are the measures most often used with primary and secondary school students. The difficulty of using goal interdependence scales to measure young students' attitudes may result from the inability of youngsters to understand tightly drawn distinctions between concepts such as cooperation and helping.

A second issue is that teachers who attempt to assess student attitudes toward goal interdependence conditions may be struck by the number of their students for whom competition, cooperation, and individualism appear to be on a continuum or continua. This is a fallacy of descriptive data or measures of central tendency. It is likely that within any sample are subjects who perceive competition, cooperation, and individualism to lie on any number of continua. This study suggests that on average students do not view goal interdependence conditions to lie on a continuum. If however, a larger percentage of students had perceived competition, cooperation, and individualism to be alternative and therefore correlated choices, then the relationship between them would have been much stronger.

Many researchers have established procedures for categorizing subjects as competitors, cooperators, or individualists using variations of the prisoner's dilemma paradigm (Griesinger & Livingston, 1973; Kagan, 1977; Knight, 1981; Knight & Dubro, 1984; Kuhlman &

Marshello, 1975; Liebrand, 1984; McClintock, 1978; Sawyer, 1966). These procedures force subjects to use some dimension to polarize competition, cooperation, and individualism so that they can choose between them. Continuous measures can be used to partition subjects as well, competitors would score high on competition and low on cooperation and individualism, cooperators would score high on cooperation and low on competition and individualism, and individualists would score high on individualism and low on competition and cooperation. However, partitioning techniques are generally unable to categorize all people and therefore the results of the analysis would apply to a subset of the sample and general population.

The interactional perspective suggests that a greater amount of variance can be explained when situation, person, and interaction effects are examined (Feather, 1988; Magnusson, 1988; Owens & Barnes, 1982; Sherif & Sherif, 1969). This perspective suggests that a better understanding of goal interdependence would be found in studies that collect data for large samples and divide the overall sample into groups representing competitors, cooperators, individualists, and other subjects who do not view competition, cooperation, and individualism to be related. Such a study would then be able to examine within each group, the structure of interrelationships, relationships with correlates, and predictions in actual or vignette data. It is likely that different patterns of relationships will exist within each group which would provide a more complex, yet more accurate picture of student attitudes.

A logical next step in this line of research is to examine these same relationships in actual classroom conditions. That is, to determine whether goal interdependence scales can predict student attitudes toward actual goal interdependence conditions. Additional research is also needed to examine the relationships of goal interdependence characterizations of competition, cooperation, and individualism in other contexts. The goal interdependence concept has application for many different aspects of life such as athletics, business, education, politics, negotiations, interpersonal attraction, prejudice and discrimination, aggression, and group behavior. A more complex and dynamic description of goal interdependence should integrate findings for various contexts, people, and cultures.

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APPENDIX A

QUESTIONNAIRES AND COVER LETTER TO SUBJECTS IN THE RESEARCH STUDY

Introduction to Experiment

This experiment is being conducted by Joe Grisham, a graduate student in the Psychology Department, under the direction of Dr. OJ Harvey. Please direct any questions you may have about this experiment to either one of us by calling the following numbers: Joe Grisham, 492-3459; Dr. Harvey, 492-1125, or by sending information to the following address: Campus Box 345, University of Colorado, Boulder, CO 80302.

This experiment asks for your opinions about various educational structures often found in college classrooms. Your rights as an experimental subject are protected by the Human Research Committee at the University of Colorado, Boulder. Among these rights are the following: you have the right not to respond to any question, the right to withdraw from the study at any time, and the right not to participate in this study at all. If you have any concerns along these lines, please talk with the experimenter

You should proceed through the attached booklet at your own pace. The total amount of time required to complete this booklet will vary for each person, but you should finish within 1 hour and 15 minutes to 1 hour and 45 minutes, and you will receive 2 experimental credit hours for participating. Enclosed in this booklet are five different questionnaires of which the School Setting Questionnaire (SSQ) and the Classroom Questionnaire (CQ) represent the largest parts. The following questions are examples of the types of questions you will be asked to answer:

1. I feel motivated in classes in which students work for group grades.
2. I like t. ying to get better grades than other students.
3. It bothers me when I have to do my work by myself.
4. I sometimes find myself carelessly doing things that I might find difficult.
5. I'll use any excuse to socialize with other students.
6. I like to work at my own pace.
7. Other students are an unwelcome distraction when I'm studying.

If you feel uncomfortable answering these types of questions, please feel free not to participate. Once you finish answering these questionnaires , take all materials to the experimenter. He will give you a feedback sheet which further explains this experiment and will give you a yellow card which shows you have completed this experiment. Thank you for participating.

Background Information. Please mark your responses on the answer sheet.

1. What is your gender/sex?
   a. male
   b. female

2. In what school are you enrolled at the University (or intend to enroll in)?
   a. arts and science
   b. business and administration
   c. engineering and applied science
   d. environmental design
   e. journalism and mass communication
   f. law
   g. music
   h. pharmacy

3. What year are you in at the University?
   a. freshman
   b. sophomore
   c. junior
   d. senior

4. What is your college cumulative GPA?
   a. 0.00 - 0.49
   b. 0.50 - 0.99
   c. 1.00 - 1.49
   d. 1.50 - 1.99
   e. 2.00 - 2.49
   f. 2.50 - 2.99
   g. 3.00 - 3.49
   h. 3.50 - 4.00

5. How old are you?
   a. 17
   b. 18
   c. 19
   d. 20
   e. 21
   f. 22
   g. 23
   h. 24
   i. 25
   k. 26 or older

6. What is your religious preference?
   a. protestant
   b. catholic
   c. Moslem
   d. Jesus Christ of Latter Day Saints
   e. none of the above
   f. agnostic

Please indicate how well the following statements describes you. Use the following scale to determine your response. Mark your responses on the answer sheet starting with number 7.

totally false	false	more false than true	more true than false	true	totally true
A	B	C	D	E	F

7. In general, I prefer to work a puzzle that I know I can complete rather than try to do a puzzle that might be too hard for me.

8. If I do poorly on something, I usually prefer to not let anyone else know or try to cover it up.

9. I sometimes find myself carelessly doing things that I find difficult.

10. When I compete with someone who seems to be better than I am, I sort of give up trying.

11. Sometimes when others are talking about their accomplishments, I find myself exaggerating things I have done in the past.

12. I usually avoid telling a joke in public because people might not laugh.

13. When I do something particularly well, I usually let my family and friends know.

14. There are times when I worry about being a successful student.

15. I would avoid taking a course in which I might do poorly even if it were very interesting.

16. When I feel uncertain about how I might perform compared to others in an activity, I prefer to watch rather than participate.

Note. From "Type A behavior in housewives: Relation to work, marital adjustment, stress, tension, health, fear of failure, and self-esteem" by K. Houston and K. Kelly, Journal of Psychosomatic Research, 31, 55-61.

Indicate how much you agree or disagree with the following statements. Mark your responses on the answer sheet. Questions should be answered using the following scale.

totally false	false	more false than true	more true than false	true	totally true
A	B	C	D	E	F

17. I like to share my ideas and materials with other students.

18. It bothers me when I have to do my work all by myself.

19. I like the challenge of seeing who's best.

20. I can learn important things from other students.

21. I like my work better when I do it all myself.

22. I don't like to be second.

23. I like to help other students learn.

24. I don't like working with other students in school.

25. I am happiest when I am competing with other students.

26. I try to share my ideas and materials with other students when I think it will help them.

27. Working in small groups is better than working alone.

28. Competing with other students is a good way to work.

29. It is a good idea for students to help each other learn.

30. I like to work with other students.

31. I work to get better grades than other students do.

32. I like to cooperate with other students.

33. I do better work when I work alone.

34. I like to do better work than other students.

35. Students learn a lot of important things from each other.

36. I would rather work on school work alone than with other students.

37. I like to be the best student in class.

38. I like to compete with other students to see who can do the best work.

Indicate how much you agree or disagree with the following statements. Mark your responses on the answer sheet. Questions should be answered using the following scale.

totally disagree	disagree	disagree more than agree	agree more than disagree	agree	totally agree
A	B	C	D	E	F

39. I would rather spend free time with people than by myself.

40. I like to share my ideas and materials with other students.

41. I often ask other students how they scored on a test.

42. I like to help other students learn.

43. I enjoy talking with other students about school work and anything else that interests me.

44. I like when other students help me to learn.

45. I feel a strong need to know how others have performed on a test.

46. I am happiest when I am sharing my ideas with other students.

47. I enjoy the relationships that develop when students share ideas and help each other learn.

48. I'd like to be a part of several school groups such as sports, clubs, drama, et cetera.

49. I resent it when teachers require students to help each other learn their school work.

50. I like school activities that allow students to socialize with each other such as discussions, projects, et cetera.

51. In order to feel that I really understand how I've performed on a test, I want to know both how I have performed and how other students have performed.

52. I learn material quickly when I help other students learn.

53. I get my best ideas in classes requiring students to share ideas and materials with each other.

54. I do my best work when I share ideas and help other students learn.

55. I like classroom activities that are filled with lots of loud fun.

56. I like the feelings that develop between students when they share ideas and help one another learn.

totally disagree	disagree	disagree more than agree	agree more than disagree	agree	totally agree
A	B	C	D	E	F

57. I like classes in which students are required to help one another learn the material assigned.

58. I like to find out how I've scored compared to other students on tests and papers.

59. Learning how to share ideas with other students and how to help them learn will help me succeed in the future.

60. I find it exciting when students are required to share ideas and help each other learn.

61. I like the fact that schools provide students with lots of different ways of meeting and socializing with each other.

62. I am content to know only my own grade on a test or paper.

63. I enjoy the intellectual challenge in courses requiring students to share ideas and help each other learn.

64. I'll use any excuse to socialize with other students.

65. I like it when professors summarize how the class performed on a test because it helps me understand how I did compared to other students.

66. I feel great when I've helped another student understand his or her school work.

67. I like to participate in group projects just so I can be with other students.

68. I understand my school work best in classes in which students share ideas and materials.

69. I like interacting with other students whether I do so by competing, cooperating, helping, working, sharing, ...

SCHOOL SETTING QUESTIONNAIRE (SSQ)

In this survey there are many questions that ask about your feelings toward different aspects of school settings. Many of the questions are worded similarly and change only a single word from one question to the next. Therefore, it is important that you read each question carefully so that you understand its meaning. Once you understand the question, mark the answer that represents your first response. Try not to dwell on any one question.

Some questions may ask about things you have never experienced. In these cases, answer the questions based on how you think you would feel.

There are no right or wrong answers. Our only interest is to find out how students feel about these different aspects of school environments. All answers to this survey are strictly confidential. There is no way for us to connect you with your answers, so **please answer the questions honestly.**

Thank you for participating!!

HOW TO ANSWER QUESTIONS. Indicate how much you agree or disagree with each statement. Mark your responses on the answer sheet. Completely erase any mismarked answers. If you need a pencil or an eraser, please let the experimenter know.

Questions should be answered using the following scale.

totally disagree	disagree	disagree more than agree	agree more than disagree	agree	totally agree
A	B	C	D	E	F

totally false	false	more false than true	more true than false	true	totally true
A	B	C	D	E	F

70. I like courses in which my grade depends on how well I perform in comparison to other students.

71. I like courses in which my grade is based in part on my own performance and in part on the performance of other students.

72. I like courses that assign grades using some criterion (such as 90%=A, 80%=B, etc.) so that my grade depends solely on my own performance.

73. I learn my school work quickly when I'm trying to outperform others.

74. I am the happiest when I work with other students to complete a task from which we will all benefit.

75. I like classes in which I work to complete my own assignments, and other students cannot influence whether I complete them or not.

76. I like the feeling I get when I'm working with other students on a task on which we will all "sink or swim" together.

77. I like courses that require students to work to outperform one another in daily activities.

78. I feel motivated in courses in which I must work by myself to complete my assignments.

79. I enjoy the relationships that develop when students find out that their grades depend on outperforming each other.

80. I like trying to get better grades than other students.

81. I like courses in which student grades reflect both the student's individual performance and the performance of students with whom he or she is working.

82. I like courses in which my grade is based on my own performance, and other students can not influence the grade I get.

83. I find that trying to be better than others helps me come up with good ideas.

84. I am happiest when I'm working with other students to complete a task that requires us to coordinate our efforts to complete it.

85. I like working to complete a project on my own.

totally false	false	more false than true	more true than false	true	totally true
A	B	C	D	E	F

86. I enjoy the relationships that develop when students must coordinate their efforts in order to complete a task.

87. I dislike courses that require me to work to outperform other students.

88. I enjoy the challenge of working to complete my assignments by myself.

89. I like the competitive feelings that develop between students when they are trying to get the highest grades.

90. I dislike courses in which my grade depends on how well I perform compared to other students.

91. I like courses that assign group grades for group projects.

92. Grading systems in which my grade is based solely on my performance, and other students can not influence the grade I get, are fair.

93. I do better work when I know I have to compete against other students.

94. I find that working with other students on projects from which we will all benefit increases my motivation to work hard.

95. I like school work that I can finish on my own without having to interact with other students.

96. I enjoy the relationships that develop between students when they realize that their grades depend on their own test scores and the test scores of other students.

97. I like classes that structure competitions between students.

98. I am happiest when I'm working to complete my assignments, and other students cannot influence whether I complete them or not.

99. I like the relationships that develop between students when they try to outperform each other on a task.

100. Grading systems in which my grade depends on how well I perform in comparison to other students are fair.

101. I like courses in which student grades on tests and projects are combined to form a group grade.

102. I like classes in which my grade depends solely on my own performance, regardless of how others perform.

totally false	false	more false than true	more true than false	true	totally true
A	B	C	D	E	F

103. Learning how to outperform others in school will help me be successful in later life.

104. I enjoy the challenge of working on projects that require the efforts of several student to complete the task.

105. I don't like classes in which students work by themselves to complete their work.

106. I like the feeling of concern students have for one another when they are working for group grades.

107. I like classroom activities that require students to work to outperform each other.

108. I feel unmotivated to work hard when I must work by myself to complete my assignments.

109. I like the feelings that develop between students when they realize that they have to try to beat each other on a task.

110. I feel motivated when my grade depends on how well I perform compared to other students.

111. I like courses in which students work, either alone or in groups, for group grades.

112. I like courses in which my grade is based solely on my own performance.

113. I find I learn quickly when I work towards my own goals without having to pay attention to other students and their goals.

114. I like to work on school projects that require both my own efforts and the efforts of other students in order to complete them.

115. Other students are an unwelcome distraction when I'm studying to complete an assignment.

116. I find that I understand my school work better when I work with other students on a project that requires us to coordinate our efforts.

117. I feel motivated about my work when I have to compete against others in class.

118. I prefer my relationships with other students to be based on something other than grades.

119. I feel motivated in classes in which students work together for group grades.

totally false	false	more false than true	more true than false	true	totally true
A	B	C	D	E	F

120. The excitement of competing against other students for grades motivates me to work hard.

121. I like courses in which students coordinate their efforts to complete a task and they receive a group grade for their work.

122. I feel motivated when my grades are based on my own efforts and no one else can influence them.

123. I find that I get the my best ideas when I work by myself without having to pay attention to other students and their ideas.

124. I like tasks that require students to coordinate their efforts.

125. I feel motivated in courses in which my grade is based solely on my own performance.

126. I learn as much from other students as I do from the teacher on tasks that require students to coordinate their efforts to complete them.

127. I enjoy the challenge of trying to perform better than other students in one-on-one competitions.

128. I feel uncomfortable in relationships with other students that are based on grades.

129. I enjoy the challenge of working to get the grade I want in courses in which my grade depends on my own performance and the performance of other students.

130. I enjoy the challenge of trying to get better grades than other students.

131. I like courses in which students work by themselves on part of a group project and their grades are based on their own work as well as on the overall group project.

132. I enjoy the challenge of working to get the grades I want, especially when other students cannot influence whether I get them or not.

133. I like my work best when I when I do it by myself without anyone's help.

134. I like classes in which students must work together to complete tasks that any one student couldn't complete on his or her own.

135. I prefer not to think about my feelings for other students when I'm studying to complete an assignment.

totally false	false	more false than true	more true than false	true	totally true
A	B	C	D	E	F

136. Learning how to work with other students toward common goals will help me in the future.

137. I enjoy the excitement in classes where students try to outperform one another on a task.

138. I like assignments that students can finish without help from others.

139. I prefer to concentrate solely on my work and to avoid assignments requiring me to interact competitively or cooperatively with other students.

140. I am happiest when I'm trying to get better grades than other students.

141. Courses in which my grade depends on both my own performance and the performance of other students increase my motivation to work hard.

142. I am happiest when I am working to get the grades I want, and other students cannot influence whether I get them or not.

143. Learning how to work on my own will help me be successful in the future.

144. I feel confident that I will get the grade I deserve in classes that require students to coordinate their efforts to complete their assignments.

145. I understand my school work best when I study it by myself.

146. I learn material quickly when I work with other students to complete a task.

147. I am happiest when I am actively competing against other students to show who knows more.

CLASSROOM QUESTIONNAIRE

On the following pages are eight descriptions of different classroom activities. Each page describes an activity or how a classroom is organized and then asks questions about how you feel about the class. Read each description carefully, then answer the questions on the opposite page. Your responses should be marked on the answer sheet. There are a total of 82 questions in this questionnaire. Please check your answer sheet to make sure you have correctly coded your responses. If you have any questions, please talk with the experimenter.

There are no right or wrong answers. We are interested only in how you feel about these different classroom settings. Please read each class description carefully so that you understand it, and then answer the questions honestly. All answers are confidential. Thank you for your help.

Activity #1.

Your instructor assigns new materials for students to learn during a two week block. **During the first week** the instructor teaches the material to the whole class. **During the second week**, students are given class time to study the material. **At the end of the second week**, students engage in one-on-one competitions for points, in a game-type format, against other students in the class.

Since it is a small class (20 students), every student will compete against every other student in the class many times during the competitions. Each student accumulates points based on these competitions. Your grade is assigned based on the total number of points you get in competitions and your score on a quiz covering all of the materials. Students tend not to study together since they are constantly competing with one another.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 1-9.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

1. Do you like this new activity?

Do you **like** each of the following aspects of this activity?

2. studying by yourself
3. one-on-one competitions for points
4. your grade depends on the number of points you accumulate in competitions
5. your grade depends on your score on a test covering the materials

Do you find each of the following aspects of the course to be **motivating**?

6. studying by yourself
7. one-on-one competitions for points
8. your grade depends on the number of points you accumulate in competitions
9. your grade depends on your score on a quiz covering the materials

Activity #2.

In this activity you are required to work on your own to complete each block of materials. You check-out all learning materials from the instructor and study them at your own pace and on your own. If you have difficulty understanding something, you ask the instructor for help. Once you feel confident that you understand all materials, you take a quiz. You are allowed to seek help only from the instructor. This is to ensure that your work represents your own efforts.

Your grade is based solely on your own performance on a series of quizzes taken over each block of materials.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 10-20.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

10. Do you like this activity?

Do you **like** each of the following aspects of this activity?

11. working on an assignment that you can complete on your own
12. working to complete your assignments at your own pace
13. not being able to seek help from other students
14. taking quizzes by yourself
15. your grade is based solely on your own performance

Do you find each of the following aspects of the course to be **motivating**?

16. working on an assignment that you can complete on your own
17. working to complete your assignments at your own pace
18. not being able to seek help from other students
19. taking quizzes by yourself
20. your grade is based solely on your own performance

Activity #3.

Students are assigned to groups with 5 students in each group. Each student in the group receives part of the information needed to solve a complex question. The instructor gives one student the question to be solved. This student tries to answer the question on paper using only the information he or she was given by the instructor. After the first person tries to solve the problem, the instructor gives the question and the first person's written answer to the second person, who can use this new information (the first person's answer) and their own unique information to try to solve the problem. This process continues from one student to the next until all students have tried to solve the problem several times. Students are not allowed to talk to one another.

Your grade depends on two things. First, how well you solve the problem. Second, the average score of everyone's answer to the problem.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 21-29.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

21. Do you like this activity?

Do you **like** each of the following aspects of this activity?

22. working with other students on a task that requires the efforts of each student to complete it

23. students must rely on one another to get all the information they need to answer the question

24. not being able to talk to other students

25. your grade depends on how well you answer the question and how well other students answer the question

Do you find each of the following aspects of the course to be **motivating**?

26. working with other students on a task that requires the efforts of each student to complete it

27. students must rely on one another to get all the information they need to answer the question

28. not being able to talk to other students

29. your grade depends on how well you answer the question and how well other students answer the question

Activity #4.

In this activity students work in pairs. Each student in a pair checks out the same materials to study. Each student studies the materials on their own and at their own pace. If they don't understand something, they can ask their instructor for help, or if the instructor is busy, they can ask their teammate for help. Once both students are confident that they understand the materials, they go to the instructor to take a quiz. Each student takes a different quiz which asks different questions. Students are not allowed to help one another on the quiz. After both students have completed the quiz, they exchange papers, and using an answer sheet provided by the instructor, they grade each others' quizzes.

Each student's grade is based solely on his or her own performance on quizzes.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 30-40.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

30. Do you like this activity?

Do you **like** each aspect of this activity?

31. working on your own to complete your assignments
32. working at your own pace
33. being able to ask for help from the instructor or from your teammate
34. working in pairs to grade each others' quizzes
35. your grade is based solely on your own performance

Do you find each of the following aspects of the course to be **motivating**?

36. working on your own to complete your assignments
37. working at your own pace
38. being able to ask for help from the instructor or from your teammate
39. working in pairs to grade each others' quizzes
40. your grade is based solely on your own performance

Activity #5.

Every two weeks your instructor assigns new materials for the students to learn. **During the first week** the instructor teaches the material to the whole class. **During the second week**, students are given class time to study the material. **At the end of the second week**, students engage in one-on-one competitions for points, in a game-type format, against other students in the class. Since it is a small class (20 students), every student will compete against every other student in the class many times during the competitions. The purpose of these competitions is for students to have fun in class and to help students learn the materials so that they will do better on the final quiz.

Your grade is assigned based on your score on a final quiz covering all of the materials. Students tend not to study together since they are constantly competing with one another.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 41-47.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

41. Do you like this activity?

Do you **like** each of the following aspects of this activity?

42. studying by yourself

43. one-on-one competitions

44. your grade depends on your score on a test covering all materials

Do you find each of the following aspects of the course to be **motivating**?

45. studying by yourself

46. one-on-one competitions

47. your grade depends on your score on a test covering all materials

Activity #6.

The class is divided into groups with 5 students in each group. Each group is assigned a different part of a class topic about which they have to write a paper, and each student in your group is assigned a different part of your group's topic. Students in your group discuss where they might find information about their topics, how each subtopic relates to the group's overall topic, how to organize the paper, how to transition from one part of the paper to another, and so forth.

After these discussions and after having collected information, each student writes a draft of his or her section of the paper and brings it to class. Everyone in the group reads all sections of the paper written by other students, after which there is a group discussion about how each section of the paper should be changed in order to produce a better group paper. Next, students rewrite their own section of the paper. Finally, the paper is submitted to the instructor.

Your grade is based on how well you have written your part of the paper (draft and final), and how well written the overall group paper is.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 48-56.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

48. Do you like this activity?

Do you **like** each of the following aspects of this activity?

49. working on a paper that requires the efforts of other students to complete it

50. discussing how to organize the paper, where you might find information about the topic, et cetera

51. group discussions about how to improve each draft section of the paper

52. your grade is based on how well you write your part of the paper and how well written the overall group paper is

Do you find each of the following aspects of the course to be **motivating**?

53. working on a paper that requires the efforts of other students to complete it

54. discussing how to organize the paper, where you might find information about the topic, et cetera

55. group discussions about how to improve each draft section of the paper

56. your grade is based on how well you write your part of the paper and how well written the overall group paper is

Activity #7.

Students are assigned to groups with 5 students in each group. Each student in the group receives part of the information needed to solve a complex question. The exercise is divided into two phases. **During phase #1,** the instructor gives one student the question to be solved. This student tries to answer the question on paper using only the information he or she was given by the instructor. After the first person tries to solve the problem, the instructor gives the question and the first person's written answer to the second person, who can use this new information (the first person's answer) and their own unique information to try to solve the problem. This process continues for several rounds from one student to the next until all students have tried to solve the problem several times. Students are not allowed to talk to one another.

During phase #2, all students meet for 20 minutes to discuss the question and its solution. After this discussion, each student tries to answer the question on paper by him or herself. Your grade depends on two things. First, how well you solve the problem. Second, the average score of everyone's answer to the problem.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 57-67.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

57. Do you like this activity?

Do you **like** each of the following aspects of this activity?

58. working with other students on a task that requires the efforts of each student to complete it

59. students must rely on one another to get all the information they need to answer the question

60. not being able to talk to other students

61. group discussions about how to answer the question

62. your grade depends on how well you answer the question as well as how well other students answer the question

Do you find each of the following aspects of the course to be **motivating**?

63. working with other students on a task that requires the efforts of each student to complete it

64. students must rely on one another to get all the information they need to answer the question

65. not being able to talk to other students

66. group discussions about how to answer the question

67. your grade depends on how well you answer the question as well as how well other students answer the question

Activity #8.

Every two weeks the instructor assigns a new unit of materials to be learned by the class. **During the first week**, students are assigned to groups called "**hometeams**" and each student in a hometeam is assigned a different part of the learning unit. Students from different hometeams, who have been assigned the same materials, meet in "**expert groups**." The goal of these expert groups is to ensure all students, who have been assigned the same material, understand the material well enough to teach it to other students when they return to their hometeams.

During the second week and after students have met in their expert groups, all students return to their hometeams to teach their hometeam members what they have learned and learn what the other members have learned.

At the end of the second week, students engage in one-on-one competitions against students from other hometeams. Each student accumulates points based on these competitions. Additionally, all the students in a hometeam add their points together to get a hometeam total score.

On the last day, all students take a quiz covering the total learning unit. Each student's grade is based on four things: 1) how many points he or she accumulates during competitions, 2) how well he or she does on the final quiz, 3) how well his or her hometeam does compared to other hometeams in competitions, and 4) how well his or her hometeam does on the final quiz.

Questions for this activity are on the opposite page.

QUESTIONS. Use the following scale to answer questions 68-82.

no, not at all	no	no more than yes	yes more than no	yes	yes absolutely
A	B	C	D	E	F

68. Do you like this class?

Do you **like** each of the following aspects of the activity?

69. students work together in expert groups to learn their assigned materials

70. students in hometeams must rely on one another in order to learn other parts of the learning unit

71. one-on-one competitions against students from other hometeams for points

72. your grade depends on how many points you get in competitions

73. your grade depends on how well you score on a final quiz

74. your grade depends on how many points you get in competitions as well as how many points your hometeam gets in competitions

75. your grade depends on how well you score on a final quiz as well as how well your hometeam scores on the final quiz

Do you find each of the following aspects of the course to be **motivating**?

76. students work together in expert groups to learn their assigned materials

77. students in hometeams must rely on one another in order to learn other parts of the learning unit

78. one-on-one competitions against students from other hometeams for points

79. your grade depends on how many points you get in competitions

80. your grade depends on how well you score on a final quiz

81. your grade depends on how many points you get in competitions as well as how many points your hometeam gets in competitions

82. your grade depends on how well you score on a final quiz as well as how well your hometeam scores on the final quiz