

## BRIEF RESEARCH REPORT

# Effects of Informal Cooperative Learning and the Affiliation Motive on Achievement, Attitude, and Student Interactions

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The purpose of this study was to investigate the effect of informal cooperative learning and the affiliation motive on achievement, attitude, and student interactions. Participants classified as high or low need for affiliation used either an informal cooperative learning strategy or an individual strategy while receiving information, examples, practice and feedback from an instructional television lesson. Results indicated that participants who used the individual strategy acquired significantly more knowledge from the lesson and indicated significantly more continuing motivation for working alone than those who used the informal cooperative strategy. Instructional strategy did not influence performance on the application portion of the test. Results also revealed that high affiliation participants expressed significantly more continuing motivation than low affiliation participants for working with another person. Low affiliation participants expressed significantly more continuing motivation than high affiliation participants for working alone. Finally, results indicated that high affiliation dyads exhibited significantly more on-task group behaviors (taking turns, sharing materials, group discussion of content) and significantly more off-task behaviors than low affiliation dyads. © 2000 Academic Press

Proponents of active learning believe that cooperative strategies should be implemented in college classrooms to help students internalize, understand, and remember material (Bonwell & Sutherland, 1996; Johnson, Johnson, & Smith, 1991; Smith, 1996). These writers have suggested a variety

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of ways to implement cooperative learning in college classrooms ranging from highly structured, long-term, *formal* cooperative groups to less structured, short-term, *informal* cooperative groups (Bonwell & Sutherland, 1996; Johnson, Johnson, & Smith, 1991; Smith, 1996; Smith & MacGregor, 1992). Informal cooperative learning allows students to work together in temporary, ad hoc groups that last from a few minutes to one class period. These informal cooperative groups are organized so that students engage in focused, "turn-to-your-partner" discussions before, during, and after a lecture (Johnson et al., 1991; Smith, 1996).

According to Johnson and Johnson (1996), informal cooperative learning can be used during a film to focus student attention, help set expectations, ensure cognitive processing, and provide closure to instruction. Furthermore, Adams, Carson, and Hamm (1990) suggested that cooperative strategies can influence attention, motivation, and achievement when students use the medium of television. However, the few studies that have investigated the use of cooperative learning with instructional television (ITV) have produced mixed results. Some researchers have found that college students who worked alone during an ITV lesson learned more content and expressed more continuing motivation than those who worked in cooperative groups (Klein, Erchul, & Pridemore, 1994). Others have reported that college students who used cooperative strategies to learn from ITV spent more time working on practice activities and reported greater satisfaction than those who worked alone (Klein & Pridemore, 1992). Still others have indicated that instructional elements like orienting activities and type of practice influenced achievement, motivation, and interactions when college students used cooperative learning with ITV (Klein & Pridemore, 1994).

The mixed results for implementing cooperative learning with ITV may be attributed to the needs and motives of the students who participated in these studies. Advocates of cooperative learning have indicated that some individuals are more predisposed than others to act cooperatively (Johnson & Johnson, 1989) and that this predisposition may influence how students cooperate when they work with others (Slavin, 1983). Others have suggested that students should be provided with opportunities for cooperative interaction to satisfy their need for affiliation (Keller, 1983). The need for affiliation is represented by a desire to participate in cooperative, noncompetitive activities and by a desire for close, friendly relationships with others (McClelland, 1965, 1976). Individuals with a high need for affiliation are more friendly, sociable, and cooperative than those with a low need for affiliation (Jackson, 1974).

A few researchers have investigated the influence of affiliation motives and related constructs in cooperative learning settings. Klein and Pridemore (1992) reported that college students with high affiliation who worked alone during an ITV lesson performed worse than students in all other treatment

groups when asked to apply what they had learned from the lesson. Chan (1980–1981) found that high school students with high need for affiliation indicated more preference for group work than those with low need for affiliation. Chan did not find achievement differences between high and low affiliation students when they used either a cooperative or individual learning method. Hall et al. (1988) reported that pairs of college students who were classified as having high or medium levels of social orientation performed better on a technical task than pairs who were low in social orientation. These researchers also found that college students with low levels of social orientation performed better than those with high or medium social orientation when they were required to work alone (Hall et al., 1988). Sutter and Reid (1969) reported that college students with high levels of sociability performed better using cooperative, computer-assisted instruction (CAI) and introverted students performed better using individual CAI. Finally, Jones, Sullivan, and Klein (1996) found that high school students who indicated a high preference for group work performed worse on an achievement test than those who indicated a low preference for group work when they were required to use cooperative learning with CAI. Jones et al. (1996) suggested that was due to their finding that students who indicated a high preference for group work exhibited significantly more off-task behaviors when placed in cooperative groups during the CAI lesson.

The purpose of the current study was to investigate the effect of informal cooperative learning and the affiliation motive on achievement, attitude, and student interactions. Participants classified as high or low need for affiliation used either an informal cooperative learning strategy or an individual strategy while receiving an ITV lesson. The study is an attempt to extend previous research (Klein & Pridemore, 1992) by examining the relationship between affiliation and student interactions in an informal cooperative learning setting.

## METHOD

### *Design and Participants*

A  $2 \times 2$  factorial block design was used in this study, with instructional strategy (individual versus informal cooperative) and need for affiliation (high versus low) as the independent variables. The dependent variables were acquisition of knowledge, application of skills, attitude, and student interaction behaviors.

Participants were 122 undergraduate education majors (34 males, 88 females) enrolled in a required course in educational psychology at a large southwestern university. Participation in the study fulfilled a requirement for this course.

### *Materials*

Materials used in this study were an instructional television lesson and a need for affiliation scale. The instructional television lesson was one of the nine units from the series *Instructional*

*Theory: A nine unit mini-course* (Gerlach, 1973). The lesson included a videotape and a workbook that provided instruction on the topic of objectives-based assessment. The videotape was divided into seven segments which presented information and examples on the content of the lesson. The videotape portion of the lesson was approximately 30 min in length. After each segment, the videotape instructed participants to turn to their workbook for practice on the content presented in that segment. The workbook included (a) a list of objectives for the lesson, (b) seven exercises that provided constructed-response practice aligned to the objectives and tests, and (c) written feedback following each exercise. For example, Segment 4 provided instruction on the use of paper-and-pencil tests, interviews, and observations of student performance or product. After providing information and examples of these three types of objectives-based assessment, the tape presented viewers with three instructors who wished to evaluate a student's work of sculpture. The videotape directed participants to "Turn to Exercise 4 in your workbook" where they were asked to "Describe the best type of objectives-based assessment for this situation."

The affiliation scale of the Personality Research Form-E was used to measure need for affiliation. This scale consists of 16 items that measure the degree to which an individual is motivated to affiliate with others. A true-false format is used to indicate whether or not a person agrees with statements such as "Sometimes I have to make a real effort to be social" and "I spend lots of time visiting friends." According to Jackson (1974), a high score on this scale suggests that the individual enjoys being with other people, accepts people readily, and makes an effort to have friends and maintain associations with others. Norming data indicate that the average score on this scale is 8.6 ( $SD = 3.35$ ) and that the internal consistency reliability is .86 when used with college students (Jackson, 1974). The median score for participants in the current study was 10 and the range was 2-16.

### *Criterion Measures*

Criterion measures in this study were a posttest and an attitude survey. In addition, data on interaction behaviors were collected for participants in the cooperative condition.

The posttest consisted of 15 constructed-response items developed for use in a previous study (Klein et al., 1994). Items were directly aligned with the objectives and practice found in the ITV lesson. Ten items on this test measured application of skills and five items measured acquisition of knowledge. Each application item was worth one point; the maximum score on this section of the test was 10 points. For knowledge items, points were given for each part of a question that required a multiple response; the maximum score on this section of the test was 10. One person scored all of the items on this test without knowledge of a participant's affiliation score or treatment condition. The internal-consistency reliability was .81 on the application section and .69 on the knowledge section of the test for participants in the current study.

A 10-item, paper-and-pencil survey was used to assess student attitude. This survey consisted of all six questions from the satisfaction subscale of the Instructional Materials Motivation Scale (Keller, 1987) and four questions written by the experimenters to assess continuing motivation for returning to tasks like those implemented in the study. A 5-point Likert scale was used to answer questions such as, "I enjoyed the activity so much that I would like to learn more by participating in a similar type of activity." The Cronbach alpha internal-consistency reliability estimate of the attitude survey was .83 for participants in the current study.

The number of student interactions exhibited by participants in the cooperative dyads was observed and recorded on an observation sheet developed for a previous study (Klein & Pride-more, 1994). Interaction behaviors were grouped into the four categories of (1) helping behavior (asking for help, giving help when asked, giving unsolicited help), (2) on-task group behavior

ior (taking turns, sharing materials, group discussion of content), (3) on-task individual behavior (assuming control, taking notes, working alone), and (4) off-task behavior (talking to other about something unrelated to the lessons and non-verbal actions such as reading a newspaper).

Trained observers were centrally located among four to six dyads as participants progressed through the lesson. At 2-min intervals, an observer recorded the interaction behaviors of a dyad and then rotated to observe the next dyad. Observations continued during the entire lesson; each dyad was observed while watching the video, working on practice exercises, and waiting for other dyads to complete an exercise. Interactions were documented on the observation sheet for type and frequency; each observer placed a mark on the sheet when a dyad exhibited an interaction behavior. Observers were not informed of the affiliation scores for their assigned dyads.

Inter-rater reliability was established prior to the study by having four observers watch a videotape of one dyad working together on an instructional lesson. Reliability was based on observers having similar totals for this dyad in each of the four behavior categories and was calculated using percentage of agreement. The inter-rater reliability was 80% for helping behaviors, 85% for on-task group behaviors, 90% for on-task individual behaviors, and 100% for off-task behaviors.

### *Procedures*

Several weeks before receiving the instructional treatment, all participants completed the affiliation scale of the Personality Research Form-E (Jackson, 1974). Participants were blocked by affiliation using the median score obtained from the current sample ( $Md = 10$ ) and were randomly assigned to either the individual or informal cooperative treatment. Affiliation scores were also used to assign partners in the cooperative treatment; high affiliation participants worked together in dyads and low affiliation participants worked together in dyads.

Individuals and cooperative dyads participated in the study in separate rooms; each room had more than one individual or dyad present at a time. Desks in the cooperative condition were arranged side-by-side in pairs to allow students to work together; desks in the individual condition were arranged in a traditional classroom format in rows. After everyone was seated, all participants were informed that they would be viewing an instructional television program on objectives-based assessment and that they would be using a workbook to receive practice and feedback on the content of the lesson. In addition, all participants were told to write the answer to each practice exercise in the workbook and read the feedback that followed each exercise.

Participants received specific directions for implementing individual versus cooperative strategies. Participants in the individual condition were each given a workbook, instructed to work independently during the lesson, and told to do their best work. Individuals were also informed that they could earn bonus points in their course if they achieved 90% or better on the end-of-lesson test. Participants in the informal cooperative condition worked with a partner who had a similar affiliation motive. Each dyad was given a workbook and told to (a) work together during the lesson, (b) discuss all practice exercises and any disagreements over the answers, and (c) discuss the given feedback. Cooperative participants were also informed that they could earn bonus points in their course if they and their partner both achieved 90% or better on the test.

After the above instructions were provided, the videotape was started for each treatment condition. When Segment 1 was completed, the tape was stopped and participants completed Exercise 1 in their workbooks. When participants indicated that they were ready, the videotape was started again. This cycle was continued until all seven sections of the lesson were completed. The interaction behaviors of participants in the cooperative condition were observed throughout the lesson following the procedures described above. In addition, the notes on the

behaviors of individuals were recorded to account for any possible bias that might be introduced by observing participants in only one treatment condition. Upon completion of the lesson, all workbooks were collected and each subject individually completed the attitude survey and the posttest.

## RESULTS

### *Achievement*

Posttest scores were obtained and analyzed for all 122 participants in the study. Separate  $2 \times 2$  analysis of variance (ANOVA) tests were conducted on the scores from the knowledge and application sections of the posttest since a previous study suggested that these types of items may be influenced differently in cooperative learning settings (Klein & Pridemore, 1994). ANOVA conducted on knowledge scores revealed a significant main effect for instructional strategy [ $F(1, 118) = 4.25, p < .05, ES = .37$ ]. Participants who worked alone ( $M = 5.57$ ) performed better on the knowledge portion of the test than participants who worked in informal cooperative groups ( $M = 4.81$ ). ANOVA did not show a main effect for affiliation motive [ $F(1, 118) = 0.93$ ] or an interaction between strategy and affiliation [ $F(1, 118) = 0.81$ ]. ANOVA conducted on the application scores did not indicate a significant main effect for instructional strategy [ $F(1, 118) = 0.86$ ], affiliation motive [ $F(1, 118) = 1.87$ ], or an interaction between strategy and affiliation [ $F(1, 118) = 0.01$ ].

### *Attitude*

Attitude scores were obtained and analyzed for all 122 participants in the study. A multiple analysis of variance (MANOVA) was conducted on these data by including each of the ten survey items as dependent variables (see Stevens, 1996). MANOVA was followed by univariate analyses on the individual attitude items if a significant multivariate effect was found. MANOVA revealed a significant main effect for instructional strategy [ $F(10, 109) = 2.26, p < .05$ ] and need for affiliation [ $F(10, 109) = 2.29, p < .05$ ]. MANOVA did not indicate a significant interaction between strategy and affiliation [ $F(10, 109) = 0.33$ ]. Follow-up univariate analyses indicated that participants in the individual treatment ( $M = 2.97$ ) expressed significantly more continuing motivation than those in the informal cooperative treatment ( $M = 2.55$ ) for future activities that would allow them to work alone [ $F(1, 118) = 4.60, p < .05, ES = .37$ ]. In addition, participants with low affiliation ( $M = 2.98$ ) expressed significantly more continuing motivation than participants with high affiliation ( $M = 2.60$ ) for activities that would allow them to work alone [ $F(1, 118) = 3.67, p = .058, ES = .33$ ]. Furthermore, high affiliation participants ( $M = 3.63$ ) expressed significantly more continuing motivation than low affiliation participants ( $M = 3.06$ ) for

TABLE 1  
Number of Interaction Behaviors Exhibited by Cooperative Dyads<sup>a</sup>

Interaction behavior	Dyad type	
	Low affiliation	High affiliation
Helping	92	90
On-task group	67	97
On-task individual	57	48
Off-task	8	25

<sup>a</sup> Data are reported for a sample of 13 low and 13 high affiliation dyads.

participating in future activities that would allow them to work with another person [ $F(1, 118) = 7.40, p < .01, ES = .49$ ].

### *Cooperative Interaction Behaviors*

The number of student interactions exhibited by participants in the cooperative dyads were observed and recorded for all dyads. Chi-square tests of significance were used to analyze data for each of the four categories of interaction behaviors. Data from 13 low affiliation dyads and 13 high affiliation dyads were included in these analyses. Table 1 shows the number of interaction behaviors exhibited by these dyads. Chi-square tests of significance conducted on these data revealed that high affiliation dyads exhibited significantly more on-task group behaviors (taking turns, sharing materials, group discussion of content) than low affiliation dyads [ $\chi^2 = 5.49, p < .05$ ]. Furthermore, high affiliation dyads exhibited significantly more off-task behaviors than low affiliation dyads [ $\chi^2 = 8.76, p < .01$ ].

## DISCUSSION

The purpose of this study was to investigate the effect of informal cooperative learning and the affiliation motive on achievement, attitude, and student interactions. Participants classified as high or low need for affiliation used either an informal cooperative learning strategy or an individual strategy while receiving an instructional television lesson.

Results indicated that participants who used the individual strategy performed significantly better on the knowledge portion of the posttest test and indicated more continuing motivation for working alone than those who used the informal cooperative strategy. These findings are consistent with results from another study where college students who worked alone during an ITV lesson learned more content and expressed more continuing motivation than those who worked in cooperative groups (Klein et al., 1994). However, results should be interpreted with caution since effect size estimates in the

current study indicated that instructional strategy had a small effect on knowledge acquisition and continuing motivation.

While instructional strategy had a significant effect on knowledge acquisition, it did not influence performance on the skill application test. This was likely due to the instructional materials used by students in both treatment conditions. The ITV lesson was designed following a systematic approach and included objectives, information, examples, practice, feedback, and review; posttest items were directly aligned with objectives and practice activities found in the lesson. Bossert (1988–89) suggested that researchers comparing individual and cooperative learning do not consistently find differences between these methods when well designed instructional materials are used and that many studies showing positive results in favor of small groups have compared carefully designed cooperative materials to poorly designed instructional materials for individuals. Furthermore, Druckman and Bjork (1994) indicated that treatments have not always been well controlled in cooperative learning studies. In the current study, participants were assigned to controlled treatments and well designed instruction was used by all participants.

Turning to the affiliation motive, the results of the current study support the notion that some people are more predisposed than others to act cooperatively (Johnson & Johnson, 1989) and that this predisposition may influence how students cooperate when they work with others (Slavin, 1983). Results revealed that high affiliation participants expressed significantly more continuing motivation for working with another person in the future and low affiliation participants expressed significantly more continuing motivation for working alone in the future. Furthermore high affiliation dyads exhibited significantly more on-task group behaviors (taking turns, sharing materials, group discussion of content) and significantly more off-task behaviors than low affiliation dyads. Combined with the findings of other researchers (Chan, 1980–81; Hall et al., 1988; Jones et al., 1996; Klein & Pridemore, 1992; Sutter & Reid, 1969), the results from the current study suggest that educators should consider students' needs and motives for working with others before assigning them to an individual or cooperative learning strategy.

Some potential limitations of this study should be noted. The relatively short duration of the treatment may have influenced results in this study. Extending the overall time for instruction may lead to results in favor of cooperative learning not found in this study. Furthermore, including higher-order problems on the achievement test could increase the benefits of this instructional strategy. In addition, because participants in the study were predominately female undergraduate education majors, the generalizability of the results are limited. Finally, the average score on the need for affiliation measure in this sample was somewhat higher than the average for the general college population reported by Jackson (1974). The results of the current



study may have been different if more students with a lower need for affiliation had participated.

Future research should continue to explore the use of informal cooperative learning with mediated instruction. While findings from the current study do not support the assertion that small group strategies can affect achievement and attitude when students are presented with films or television (Adams, Carson, & Hamm, 1990; Johnson & Johnson, 1996), these claims should be tested when students use mediated lessons that were not designed following an instructional systems approach. Researchers should continue to examine student characteristics to discover which attributes influence interactions, attitude, and learning in cooperative settings. These suggestions will assist us in determining the appropriate use of cooperative learning.

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