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ABSTRACT

This study examines the effects of cooperative versus competitive goal structures on the subsequent willingness of fourth-grade children to help each other by testing three hypotheses: a) nonwinners will express lack of goodwill toward the winner in the competitive situation; b) children in the cooperative situation will evaluate their learning experience more favorably than nonwinners but less favorably than winners in the competitively structured situation; and c) female subjects will have a tendency to help others more than male subjects, regardless of the learning situation. One hundred-eighty subjects were randomly assigned to learning groups of three each. Members of the cooperative groups worked together as a group to make up a story, and all were rewarded. Members of the competitive group worked independently, and only one person was rewarded. Subjects were then given a prize-giving task and a toy take-away task. Finally, the winners chose prizes, and the others received pads of paper for participating. Results indicated that a) children in a cooperative learning environment are more likely to show goodwill toward others than are nonwinners in a competitive environment; b) winners in the competitive situation viewed the learning experience positively while nonwinners viewed it negatively, and c) data supported the prediction of sex differences. (Eleven tables and a 14-item bibliography are included.) (PD)

The Educational Context for the Study of Cooperation and Helpful Concern for Others

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The research we are reporting was designed to isolate the effects of specific classroom variables on the development of cooperation and social concern. Specifically, this study examines the effects of cooperative versus competitive goal structures on the subsequent willingness of 4th grade children to help and share with each other. In the cooperative goal situation children worked as a group on a single project and were rewarded on the basis of the group's product. In the competitive goal situation children sat at the same table with each other but worked individually on their own projects and only one child was rewarded on the basis of his individual product. In sum, two situational variables were operating in each situation: first, the variable of working on a project as a group versus as an individual and second, the variable of public reward.

This research was prompted by a host of observations, theories, and research suggesting that when children and adults work individually and where only some are publicly rewarded on the basis of their individual effort, they appear to be less likely to enjoy the experience, less likely to like each other, and less likely to work cooperatively with others than when they work and are rewarded as a group.

To begin, let us consider the observations recorded by Jules Henry (1966) in a situation where a child is publicly unable to solve a given arithmetic problem.

> "The teacher turns to the class and says, 'Well, who can tell Boris what the number is?' There is a forest of hands and the teacher calls on Peggy who says that 4 should be divided into

> both the numerator and denominator. It is obvious that Boris' failure made it possible for Peggy to succeed, and, since the excited handwaving of the children indicates that they wanted to exploit Boris' predicament to succeed where he was failing, it appears that at least some of the children were learning to hope (covertly) for the failure of fellow students. (p. 172).

According to Henry, such public "one-can-win only" learning situations are commonplace in American elementary schools. Henry suggests that the consequences of such experiences appear to be that children learn to dislike other children, to resent their successes, and eventually to act on these negative feelings. While public reward may increase the achievement of the individual rewarded, public reward may also stimulate invidious comparison between children.

Henry's descriptions and conclusions are consistent with what we would expect on the basis of both theory and research. Deutsch (1962) describes a cooperative situation as one in which "the goals of the separate individuals are so linked that there is a positive correlation between their goal attainments." (p. 276.) The psychological consequences include positive cathexis (increased liking between group members) and inducibility (willingness to do things for each other). In a competitive social situation the individuals' goals are "so linked that there is a negative correlation between their goal attainments." (p. 276.) The psychological consequences are presumably decreased liking between group members and decreased willingness to help or do for others.

Whereas Deutsch (1962) considers the effects of independent versus dependent striving toward goals and rewards, Aronfreed (1968) focuses on the consequences of shared affective experiences among persons. According to Aronfreed, altruism does have a component of self-interest; while there is no external reward for altruism it may make an individual "feel bad" to see someone suffer, "feel good" to see someone happy. Aronfreed (1968) theorizes that the first step in acquiring empathy is "a conditioning mechanism that rests on a close and repeated association between cues which convey the experience of others and

simultaneous events which have direct affective consequences for the child." (p. 118.) For example, two children experience some pleasure simultaneously; the teacher says, "You've both done such a good job"; or, even without adult sanction, two or more children work to accomplish something and are pleased with their accomplishment. In both situations, the two children share some pleasure simultaneously. Under such conditions it is likely that each child will smile or verbally convey his delight and thereby recognize his ability to share the feelings being experienced by the other.

Both experimental and naturalistic research are supportive of the predictions of Henry (1966), Deutsch (1949), and Aronfreed (1968). College student subjects in cooperative situations were perceived as friendlier, were more satisfied with the group, were more attentive to and affected by what fellow members said, and were more secure than subjects in competitive situations (Deutsch, 1949). In addition, competition (in Deutsch's terms) produced more incidences of self-oriented need behaviors and more dissatisfaction with the learning situation (Naught & Newman, 1966; Haines & McKeachie, 1967). These findings hold true for younger children as well. Stendler, Damrin & Haines (1951) studied seven-year-olds and found that friendly conversation, sharing and helping exceeded destructive, boastful and deprecatory behavior in a situation where the group was working toward a common goal and mutual reward. The reverse was true when goals were individual and rewards limited to only a few individuals. Questions which remain are what happens when rewards are limited and the same individual wins over a period of time and what happens in interpersonal encounters following the cooperative and competitive goal structures.

In regard to what happens to a person's willingness to share following a single session of success, Isen, Horn, and Rosenhan (1973) found that children who experience success are subsequently more altruistic, that is, they donate more to charity. Whether there are differential effects according to different

kinds of success remains to be studied. Does success in a cooperative as compared with a competitive goal structure have the same effects on the "winner's" subsequent willingness to help and share with a peer? Whether one is a "winner" or "loser" is certainly likely to influence one's reaction to the others in the group.

In regard to examining the consequences of cooperative and competitive goal structures across settings, a naturalistic study by Crockenberg and Bryant (1973) attempted to look at the relationship of a composite of teacher behaviors in the classroom setting with child behaviors outside the classroom setting. We found less helping and sharing among children taken from a classroom which was competitively structured than from a cooperatively structured classroom. A more controlled, experimental design became necessary to determine which variables of the composite studied are most important to the development of cooperation and social concern in children. The study we are reporting today is one of a series of experimentally controlled studies which will look at the effect of specific variables on the development of cooperation and social concern.

The present research is also concerned with the relationship between sex and willingness to cooperate and to show social concern. It is well known that females are viewed as and are expected to be more nurturant, more helping than males. Research by Margaret Mead (1949) and Matina H ·ner (1971) suggests that competent adult females achieve less than their male counterparts because women fear success. They fear rejection because success frequently means another fails and such behavior is viewed as "competitively aggressive behavior," and therefore, as "unfeminine." Not only is it expected that females will more actively help others, but also that they will avoid harming others. Data obtained from children also suggests that 4th and 5th grade girls tend to share and exhibit altruistic behavior more than do boys (Hansen, 1974; Staub, 1973).

On the basis of the foregoing theories and research the present study

was designed to test the following hypotheses: First, children in the cooperative, group condition where all children win will be more helpful to each other than children in the competitive, individual condition where only one child wins. More specifically, it is hypothesized that non-winners in the competition condition will express a lack of goodwill toward the winners in the competition situation. Second, children in the cooperative condition will evaluate their learning experience more favorably than nonwinners but not more than winners in the competitively structured situation. Third, female subjects will exhibit greater tendencies to help and share with others than will male subjects regardless of the goal structure of the learning situation.

Method

Subjects

One hundred eighty fourth graders, 90 boys and 90 girls, participated in this study. The children attended three elementary schools in a rural-suburban school district of Northern California.[1]

Teachers provided information on ethnicity and rated each child's reading ability as high, medium or low. Only Caucasians were selected for further study. Using a stratified (sex and ability) random sampling procedure children were assigned to learning groups of three children. Then groups were randomly assigned to either the group (cooperative) or individual (competitive) conditions, such that proportional numbers of each sex and each ability group were represented in each condition.

Conditions

Cooperative Condition. Children worked together as a group to make up a story and all were rewarded for their efforts.

Competitive condition. Children worked independently. Each child wrote his own story, and only one child (the randomly chosen "winner") was rewarded for his efforts.

Procedure

Pre-experimental condition. Prior to the project the children were introduced to the female experimenter; they were told that she would be their teacher in a special writing project. The E described the project briefly and then asked the children to list the three like-sex classmates they would most like to work with and the three they would most like to play with.

Experimental conditions. Each group of children was taken by the experimenter to a private room on two consecutive days, one half hour the first day, an hour the second.

On Day 1 the children were told that this was their practice day. They were shown a picture and asked to work together (Cooperative Condition) or independently (Competitive Condition) to make up a story. They were asked to include what the people in the picture were doing, feeling, thinking and how the story ended. Prior to the story writing, the experimenter explained what "feeling" meant and gave the children a practice exercise with flash cards to insure that they understood the instructions. After the story writing (a maximum of 15 minutes was allowed), the experimenter read the story/stories and praised the Cooperative Condition subjects for working together and writing a good story. In the Competitive Condition, the E praised the randomly selected "winner" for having written the best story. Then the E reminded them that they would write another story the next day. In the Cooperative Condition the children were told that they would all get prizes if they worked well together and wrote another good story on the following day. In the Competitive Condition the children were told that whoever wrote the best story the next day would get some prizes (shown by the E). Finally, the E also said she would write reports to their teacher about how they did in the writing project.

Post-experimental condition. Immediately following the experimental condition the E administered the following measures:[2] a prize giving task (Crockenberg & Bryant, 1973) in which children were asked to indicate (privately) how many

prizes (1-10) the picture (drawn earlier) of each group member deserved; and a toy take-away task (Kagan & Madsen, 1972) in which each of two children played against the third. The game involved either moving a marker to the toy, in which case the player took the pen away from the other child but could not keep the toy himself, or moving the marker away from the toy in which case the other player kept it.

Follow up. Two follow up measures were administered to the children in their classrooms: an evaluation of the writing class in the form of a seven item questionnaire; and an eighteen-item self-concept scale.[3]

Finally, the children who received prize tickets for their work in the special writing project were given an opportunity to exchange their tickets for a variety of 10-cent toys. Children who did not receive prize tickets were given pads of paper "for participating in the writing project."

Results

Giving credit to others

One measure of the willingness to help out or show goodwill to another was the number of prizes each child awarded to each other child in his "learning" group for their individually drawn pictures. The expectation was that children in the group condition would give more prizes than children in the individual one-can-win condition, particularly more than the losers. In addition, a significant sex effect was expected with girls giving more than boys. Table 1 presents the mean number of prizes awarded to others by cooperation winners, competition winners, and competition nonwinners. Table 2 shows the analysis of variance results.

Insert Tables 1 & 2 about here

Contrary to the hypothesis, no condition effects were found. There was

a clear trend for a sex effect in the hypothesized direction ($F=3.71$, $p < .06$).

To clarify the nature of reward giving to others, analyses were made comparing the number of prizes given to nonwinners by others, that is by competition winners and competition nonwinners. (All were winners in the group condition. As Table 3 indicates, no significant condition or sex effects were found in this analysis.

Insert Table 3 about here

Similarly, analyses were made comparing the number of prizes given to winners by others, that is by competition nonwinners and cooperation winners (awards to self by cooperation winners were not considered). Mean number of prizes given to winners by others are shown in Table 4 and the analysis of variance results are shown in Table 5.

Insert Tables 4 & 5 about here

Contrary to the hypothesis, nonwinners gave more, not less, to winners in their experimental group than individuals in the cooperation condition gave to their peers. There was a tendency for females to give more than their male counterparts.

Taking away something from others

One measure of showing lack of goodwill toward others is the Kagan and Madsen (1972) game where children are given the opportunity to take a toy away from a peer even when this leads to no gain for themselves. Two conditions were available for comparison: group cooperation winners versus competition nonwinners as they played against winners in their particular experimental group. Frequencies and chi-squares for this comparison are presented in Table 6.

Insert Table 6 about here

Boys, but not girls, among competition nonwinners were more likely than cooperation group members to take toys away from previous winners.

Evaluation of the learning experience

Finally, how did the children themselves perceive and evaluate this "special writing class"? Here the prediction was that group winners and individual winners would not differ, but that nonwinners in the competitive situation would view their experiences less favorably. Means for the total evaluation score (sum of the seven items on the evaluation questionnaire) and analysis of variance results are shown in Tables 7 and 8.

Insert Tables 7 & 8 about here

As Table 8 indicates the main effect of condition on total evaluation score was significant ($F=11.67$, $p < .001$).

F tests comparing the variances among the three conditions also indicates that the variance of the scores among competition winners was significantly smaller than the variances for both competition nonwinners ($F=2.44$, $p < .01$) and group winners ($F=2.30$, $p < .01$).

On the basis of analysis of variance, the following five questionnaire items showed main condition effects (d.f.=2,174): 1) "My writing class was boring" ($F=3.53$; $p < .05$); 2) "My writing class was fun" ($F=4.07$; $p < .01$); 3) "My writing class was fair" ($F=5.14$; $p < .01$); 4) "I thought my work was good" ($F=6.25$; $p < .005$); and 5) "If (special writing teacher) had given grades in the writing class I think she would have given me below average, average, good, or very good" ($F=13.70$; $p < .001$). Table 9 provides the mean scores for individual

questionnaire items.

Insert Table 9 about here

No condition effects were found for the following two items: 1) "My writing class was hard" (F=1.62) and 2) "My writing class was pleasant" (F=1.90).

To see what specific items on the evaluation had significantly different variances on the three conditions, Table 10 was prepared. The three items pertaining to feelings about the actual experience ("boring," "fun," and "fair") consistently yielded results that the variance for the cooperation winners group was larger than the variance for the competition winners. Likewise, the variance for the competition nonwinners was larger than the variance for the competition winners group. No differences of variances were found between the competition nonwinners and cooperation winners.

Insert Table 10 about here

Given the finding of unequal variances between groups the Kruskal-Wallis non-parametric analysis of variance was used to check group differences on total evaluation score and on individual evaluation items.

As Table 11 indicates, differences between groups on total evaluation score and on individual ittms (boring, fun, fair, my work good, teacher thought my work good) were all significant, n=177; d.f.=2.

Insert Table 11 about here

In addition, to determine which specific groups differed Mann-Whitney Us were calculated for both total evaluation score and individual items. As

predicted, there was only one significant difference between group winners and individual winners at the .05 level; individual winners thought the learning environment was less boring than did group winners. Group winners differed from individual nonwinners on total evaluation score, evaluation of one's own work as good, and perception of teacher's evaluation as good, all at $p < .01$. However, not only did individual winners differ from individual nonwinners on these variables, they also differed significantly ($p < .01$) in their evaluation of the writing class as less boring, more fun and more fair.

Discussion

Our results indicate that children in a group-structured, cooperative learning environment are more likely to show goodwill toward others than are the non-winning children in an individually structured, competitive learning environment. At least this relationship holds with respect to some sorts of "do-gooding," in this case, refraining from taking a toy from another child given the opportunity to do so. On the other hand, the group children gave fewer prizes to winners for their pictures than did nonwinners in the individually structured condition. How do we explain this apparent contradiction?

One possibility is that non-winning children in the competitive, one-can-win condition generalize from the teacher's recognition of excellence in peers. Perhaps as Staub (1973) suggests, a "norm of deservedness" is developed. In this study it could be argued that the "norm of deservedness" is more clearly established where there is just one winner, just one person singled out to be rewarded. It is also interesting to note that this "norm of deservedness" generalizes from creative writing performance to drawing skill. It appears that once a child has received repeated recognition for excellence (twice in this study), others will evaluate his accomplishments in other realms in a similar fashion. In other words, there is a halo effect.

One might also say that these fourth grade children come to vicariously

share the joy of the winner in a competitive situation and reveal this goodwill in the number of prizes given for a picture. But given the results of the "toy-take away" game, this interpretation seems unreasonable. Children in the competitive experience, particularly boys, expressed less goodwill by taking a toy away from the winner significantly more frequently than did boys in the cooperative experience.

It is important to note at this point that the predictions concerning sex differences received some support from the data with girls giving more prizes to others, and specifically to winners than did boys. In addition, it was only the boys in the competitive condition who took toys away more frequently than in the cooperative condition. One could say that the girls refrained from taking the toy away from the winner because such behavior was viewed as competitive, aggressive, unkind, and most of all, unfeminine. But one could also argue that the girls simply accept the "deservedness norm" to a greater extent than the boys. Not only does it generalize to giving prizes for a picture but to a game where there is no suggestion that the person "deserves" the toy except that earlier she was the story-writing "winner." But why would girls be more likely to over-generalize the norm? One would have to add an additional assumption, for example, that girls are more accepting of adult standards, more conforming than boys and this leads them to employ this standard of "reward the winner" even when the context has changed significantly

Finally, there is the question of how much the children in the cooperative and competitive conditions enjoyed their experiences. One reason frequently given for setting up competitive experiences is that children are enthusiastic about such experiences; they enjoy them. On the other hand, the research cited earlier indicates that at least older students report the cooperative learning environment to be more satisfying. The present research sheds some light on this discrepancy by distinguishing between whether one is a winner

or a nonwinner in the competitive learning environment. It was the nonwinners who perceived their learning experience most negatively--as the most boring, the least fun and the least fair, who evaluated their own performance most negatively, and who saw their writing teacher do likewise. However, while nonwinners in the study differed from group winners on these last two dimensions they differed from the winners in the competitive situation on a larger number of dimensions and to a greater extent. Thus, whether one views one's competitive learning experience as satisfying clearly depends on whether one sees oneself as a winner. As the comparison of variances suggest, the competitive winners were almost unanimously fully satisfied with their experiences.

There are, of course, other ways a learning environment might be structured. For example, children might work individually in a situation where there are different goals for each and all can win. It would also be interesting to compare the results of a group cooperation situation where the group wins versus where the group loses. Does the pleasure and the interdependence of working together lead to fewer feelings of resentment or is it the shared feelings of success that produces the results of the cooperative group learning experience reported here? Studying the effects of competition between groups of children, combining cooperative and competitive goal structures, would also answer important questions for teachers who are frequently asked to prepare children for a society that requires people to compete as well as to cooperate.

Finally, if time permits in the "question-answer" part of this symposium, we can report on findings pertaining to intrapersonal variables and processes such as self concept and giving to oneself in relation to competitive and cooperative goal structures.

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Footnotes

1. The authors wish to express gratitude to the Elk Grove School District for their cooperative participation in this research.
2. Prior to administering these measures the E gave the Paired-Hands task and wrote the reports to the teachers. Early in the research it was decided that the Paired-Hands task was not providing useful information. However, rather than discard it and thereby alter the timing of the experiment it was continued. Together these two activities took approximately twenty minutes.
3. Results pertaining to self concept will be reported at a future date.

Table 1

Mean Number of Prizes Given Others

	Condition			
Sex of Subject	Cooperation Winners	Competition Winners	Competition Nonwinners	$\bar{X}$
Male	9.97	11.20	11.15	10.77
Female	10.83	12.35	13.25	12.24
$\bar{X}$	10.40	11.78	12.20	---

Table 2

Analysis of Variance: Number Prizes Given to Others

Source	Ss	df	Mean Square	F	p
Condition	98.05	2	49.03	2.32	n.s.
Sex	78.22	1	78.22	3.71	.06
Interaction	11.56	2	5.78	.27	n.s.
Error	3669.48	174	21.09		

Table 3

Analysis of Variance: Number Prizes Given to Nonwinners

Source	Ss	df	Mean Square	F	p
Condition	.27	1	.27	.04	n.s.
Sex	13.07	1	13.07	1.73	n.s.
Interaction	.60	1	.60	.08	n.s.
Error	876.25	116	7.55		

Table 4

Mean Number of Prizes Given Winners

	Condition		
Sex of Subject	By Cooperation Winners	By Competition Nonwinners	$\bar{X}$
Male	4.83	5.70	5.33
Female	5.37	6.95	6.27
$\bar{X}$	5.10	6.32	----

Table 5

Analysis of Variance: Number of Prizes Given to Winners

Source	Ss	df	Mean Square	F	p
Condition	51.45	1	51.45	6.71	.025
Sex	27.26	1	27.26	3.55	.07
Interaction	4.40	1	4.40	.57	
Error	1043.43	136	7.67	7.67	

Table 6

Taking Away from Others (df=1)

	Cooperation Winners		Competition Nonwinners			
Sex	# Let Other Keep	# Took Away	# Let Other Keep	# Took Away	X^2	p
Males	11	9	9	31	4.96	.025
Females	13	7	22	18	.21	
Combined	24	16	31	49	4.03	.025

Table 7

Total Evaluation by Condition

	Cooperation Winners	Competition Winners	Competition Nonwinners
Mean	24.28	25.45	22.69
s.d.	3.14	2.07	3.23
n	57	40	80

Table 8

Analysis of Variance: Total Evaluation

Source	Ss	df	Mean Square	F	p
Condition	209.60	2	104.80	11.67	.001
Sex	5.25	1	5.25	.58	
Interaction	3.99	2	1.99	.22	
Error	1535.56	171	9.00		

Table 9

Learning Environment Evaluation - Individual Items

	Cooperation Winner (n=57)	Competition Winner (n=40)	Competition Nonwinner (n=80)
		Boring	
$\bar{X}$	3.81	3.98	3.76
s.d.	0	0.16	0.51
		Fun	
$\bar{X}$	3.47	3.78	3.36
s.d.	0.85	0.42	0.80
		Easy	
$\bar{X}$	3.77	3.73	3.61
s.d.	0.42	0.45	0.63
		Pleasant	
$\bar{X}$	3.44	3.65	3.38
s.d.	0.78	0.48	0.80
		Fair	
$\bar{X}$	3.44	3.70	3.21
s.d.	0.76	0.52	0.92
		My work good	
$\bar{X}$	3.16	3.22	2.74
s.d.	0.82	0.73	0.91
		Teacher thought my work good	
$\bar{X}$	3.19	3.40	2.63
s.d.	0.79	0.81	0.91

Table 10

Analyses of Variances

	F	df	p
"My class was boring"			
Cooperation winner* vs. Competition winner	6.15	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.62	(79,56)	n.s.
Competition nonwinner vs. competition winner	10.00	(79,39)	.01
"My class was fun"			
Cooperation winner vs. Competition winner	4.00	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.12	(79,56)	n.s.
Competition nonwinner vs. Competition winner	3.56	(79,39)	.01
"My class was fair"			
Cooperation winner vs. Competition winner	2.15	(56,39)	.01
Competition nonwinner vs. Cooperation winner	1.48	(79,56)	n.s.
Competition nonwinner vs. Competition winner	3.15	(79,39)	.01
"I thought my work was good"			
Cooperation winner vs. Competition winner	1.26	(56,39)	n.s.
Competition nonwinner vs. Cooperation winner	1.22	(79,56)	n.s.
Competition nonwinner vs. Competition winner	1.55	(79,39)	n.s.
"My teacher would have given me a 'good' grade"			
**Competition winner vs. Cooperation winner	1.26	(39,56)	n.s.
Competition nonwinner vs. Cooperation winner	1.55	(79,56)	n.s.
Competition nonwinner vs. Competition winner	1.24	(79,39)	n.s.

*In all cases, the larger of the two variances being compared is listed on the left side of the comparison.

**This was the only comparison where the variance of the competition winners was larger than the group winners.

Table 11

Kruskal-Wallis Analysis of Learning Evaluation Questionnaire

Total Evaluation Score	H = 23.42	$p < .01$
Boring	H = 7.35	$p < .05$
Fun	H = 7.33	$p < .05$
Fair	H = 9.02	$p < .05$
My evaluation of my work	H = 10.66	$p < .01$
Teacher's evaluation of my work	H - 24.38	$p < .01$