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ABSTRACT

Four experiments comparing behavior of children from Los Angeles, California, and Nuevo San Vicente, Baja California, Mexico, were conducted to analyze cooperative and competitive behavior of Anglo American city and Mexican rural children. Eighty children from each setting, 40 of age 7-9 and 40 of age 10-11, equally divided by sex, served as subjects for all 4 experiments. Results of Experiment I, which was designed to assess motivation and ability of children to cooperate in a problem situation with no obvious conflict of interest cues, failed to support the hypothesis of a cultural difference in motivation and ability to cooperate. In Experiment II, which assessed the degree to which children are competitive and rivalrous in a situation without direct social interaction and the necessity of mutual assistance, both groups appeared highly motivated to take a toy away from a peer when they could keep it. Anglo children, however, were more highly motivated than Mexican children to lower another child's outcomes, even when it meant no gain to themselves. In Experiment III, which examined rivalrous behavior in the presence of direct social interaction, Anglo more than Mexican children responded with conflict to a peer's rivalrous intents in an interpersonal interaction situation; Mexican children were more submissive. In Experiment IV, which measured tendencies to engage in and avoid direct interpersonal conflict, Mexican children were more avoidant of conflict than Anglo children. (Author/NQ)

EXPERIMENTAL ANALYSES OF COOPERATION AND COMPETITION OF ANGLO-AMERICAN AND MEXICAN CHILDREN[1]

by

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Abstract

Four experiments were conducted to analyze cooperative and competitive behavior of Anglo-American city and Mexican rural children. Results of Experiment I failed to support the hypothesis of a cultural difference in motivation and ability to cooperate. In Experiment II both Anglo-American and Mexican children appeared highly motivated to take a toy away from a peer when they could keep it for themselves. Anglo-American children, however, were more highly motivated than Mexicans to lower another child's outcomes even when it meant no gain to themselves. In Experiment III Anglo-American more than Mexican children responded with conflict to a peer's rivalrous intents in an interpersonal interaction situation; Mexican children were more submissive. In Experiment IV Mexican children were more avoidant of conflict than Anglo-American children. The irrational reaction to conflict of both Anglo-American and Mexican children is discussed.

Experimental Analyses of Cooperation and Competition of Anglo-American and Mexican Children[1]

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This paper reports the results of four experiments comparing the behavior of children from two settings: Los Angeles, California and Nuevo San Vicente, Baja California, Mexico. Children from these two cultures have been shown to differ profoundly in the degree to which they cooperate or compete at a choice point. Two experiments (Madsen & Shapira, 1970; Kagan & Madsen, in press), each using different techniques to force a choice between cooperation and competition, have demonstrated that Mexican children are much more cooperative and less competitive than their Los Angeles counterparts.

In view of these clear results, it was decided to inquire further into the psychological basis of the differences in cooperative-competitive behavior of children in the two cultural groups. Previous experimental situations forced children to choose between cooperation and competition. Experiment I was designed to assess the motivation and ability of children to cooperate in a problem situation with no obvious conflict of interest cues. In the absence of substantial differences between cultural groups in Experiment I, Experiments II, III, and IV were designed to successively increase the possibility of interpersonal conflict.

Experiment II assesses the degree to which children in the two cultural groups are competitive and rivalrous in a situation without

direct social interaction and the necessity of mutual assistance. Experiment III examines rivalrous behavior in the presence of direct social interaction. Experiment IV measures the tendencies of children to engage in and avoid direct interpersonal conflict.

Each subject in the following experiments participated in only one condition of one experiment, with the exception of a few Mexican children who participated in one condition of the Cooperation Box experiment and also one condition of another experiment. The Cooperation Box experiment, however, was concluded a year before the other three experiments were begun, and the subjects who participated in a second experiment did so with a different pair-mate.

Experiment I: Cooperation and Helpfulness

Previous research which forces a choice between cooperation and competition indicates that rural Mexican children are more cooperative than Anglo-American city children. The apparent cooperativeness of the Mexicans, however, may have little to do with their motivation or ability to cooperate. The Mexicans may be more cooperative than Anglo-American city children only in situations which force a choice between cooperation and competition, because of strong motivation to avoid competition (Madsen, 1967; Kagan & Madsen, in press). Also, in the forced choice situations cooperative tendencies of the Anglo-American children may be masked by a strong tendency to compete. The question, therefore, remains as to whether the Mexican children are more cooperative than Anglo-American city children in situations which have no cues for competition.

One reason to believe rural Mexicans are more able or motivated to cooperate than Anglo-American children is that rural children more than city children work with their parents and peers to help supply and maintain the basic necessities of the household. Further, because poverty forces the members of most rural Mexican families to share a limited supply, they may have a heightened realization of their interdependence and need for mutual assistance. However, interpersonal relations in a Mexican community have been described as independent and non-cooperative (Foster, 1960). Further, observations of rural Mexican children's play have revealed little tendency toward spontaneous cooperation (Maccoby, Modiano, & Lander, 1964). Thus, the basis for believing rural Mexican children to be more cooperative than Anglo-American city children is at best equivocal.

In order to put to empirical test the hypothesis of a cultural difference in ability and motivation to cooperate independent of motivation to compete, an experimental task was created which had no cues for competition or the avoidance of competition; the task could be completed only by cooperation. The task was presented under two conditions, one to assess the ability of children to cooperate when motivated to do so, and the other to measure children's spontaneous motivation to help a partner. To test for developmental and sex trends, pairs of boys and girls of two ages were selected.

Method

Subjects: Subjects for all four experiments were drawn from the same areas in which previous research had shown cultural differences in cooperation-competition situations. The Mexican children were residents

of Nuevo San Vicente (pop. 800), 88 km south of Ensenada, Mexico. The children lived either in or within a few miles of the town. The economy of the area is largely agricultural with a few small businesses in the town proper. The Anglo-American children were drawn from one elementary school and several day care centers located in lower income districts in and around Los Angeles, California. Eighty children in each culture, 40 of age 7-9 and 40 of age 10-11, equally divided by sex, served as subjects.

Apparatus: The apparatus was a Cooperation Box (68 cm long, 18 cm high, 23 cm wide) with a hinged lid that was secured in the closed position by four spring latches (Figure 1b). The latches are spaced so that the simultaneous use of four hands is necessary to open the box, thus requiring the cooperation of two children. A smaller box (18 cm square) with two latches, was used to pre-train children individually (Figure 1a).

Insert Figure 1 about here

Procedure: To minimize the possibility that subsequent differences between groups was due to differential familiarity with mechanical latches, all children were given a one-minute experience in attempting to open the two-latch box. The box was placed in front of the child and the experimenter then placed a toy in the box, closed the lid, and informed the child that he could have the toy if he could open the box. Only 15 of the 160 children, seven in Mexico and eight in the U.S., all of the younger age group except one, could not open the box within one minute. These children were given instruction.

Following pretraining, half of the children in each culture, age, and sex subgroups participated in the Cooperation condition and the other half in the Help condition. In both conditions the Cooperation Box with the lid open was placed on a small table in front of pairs of like-sexed children. In the Cooperation condition, the experimenter showed the children two identical toys, and asked the children if they would like to have the toys. After an affirmative answer, the experimenter placed the toys in the box, shut the lid, and said, "If this box is opened, you two may have the toys inside. You may do anything you like with the toys, they are for you to keep. You may talk with each other if you like, and you may both do anything you want." The experimenter then presented the Cooperation Box to the children and recorded the time to solution with a stop-watch. If the box was not opened in one minute, children were instructed in opening the box and allowed to keep the toys. Pairs received five trials, each trial with a different set of toys.

In the Help condition the experimenter showed only one toy and asked one of the children if he would like to have it. After an affirmative answer, the toy was placed in the Cooperation Box, the lid closed, and the following instructions given: "If this box is opened, 'Robert' may have the toy inside. Robert may do anything he likes with the toy, it is his to keep. You may both talk to each other if you like, and you may both do anything you want." In both conditions children received five trials, each trial with different toys.

Results and Discussion

The mean time required by each subgroup to open the Cooperation Box is indicated in Table 1 (trials collapsed). The differences among

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Insert Table 1 about here

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means were analyzed by a 2 x 2 x 2 x 2 x 5 (culture x condition x sex x age x trial) analysis of variance. All analyses of simple effects were performed by the Newman-Keuls procedure.

The results indicated no significant effects due to culture, sex, or age, but significant effects due to condition ($p < .05$) and trials ($p < .001$). Children in the Help condition averaged 7.8 seconds per trial as compared with a mean of 4.1 seconds under the Cooperation condition. The direction of this difference is the same for all subgroups. The trial effect indicated that children required more time to open the box on trial one than on successive trials. The mean time on trial one, 16.6 seconds, differed significantly from the mean time on each successive trial ($p < .001$). Mean times on the remaining four trials ranged from 4.9 to 3.1 seconds and did not differ significantly from each other. The age difference approached, but did not reach, the .05 level of significance.

The only two way interaction that reached significance was culture x sex ($p < .05$). As is evident from Table 1, the mean time was lower for Mexican girls than boys under both conditions at both ages. In the U.S., in contrast, boys were faster than girls in three of the four subgroups. This interaction was due to scores on the first trial. On trial one, Anglo-American boys were faster than girls ($p < .05$) and Mexican girls were faster than boys ($p < .01$). No significant sex differences were found on subsequent trials. This culture x sex x trial interaction is significant at the .05 level.

In view of these results, previous findings that rural Mexican children are more cooperative than Anglo-American city children at cooperation-competition choice points appear due to a cultural difference in tendency to compete rather than a difference in motivation or ability to cooperate. The results of the Cooperation condition fail to support the hypothesis that the Mexican children are better able to cooperate than are Anglo city children. The results of the Help condition fail to support the hypothesis that the Mexican and Anglo-American children differ in their motivation to help a peer. Typically, following instructions in the Help condition, children would either begin working together or after only slight hesitation would ask, "Can I help him?" or "Can he help me?" When the instruction "You can both do anything you want" was repeated, almost all children worked together vigorously to open the box.

Opening the Cooperation Box requires a certain amount of assertive leadership because at least one child must communicate the need to coordinate efforts. It has been noted that rural Mexican boys are reluctant to assert themselves or to take on leadership roles (Maccoby et al. 1964). This reluctance is consistent with the finding that Mexican boys were initially slower than Mexican girls to open the Cooperation Box. That Anglo-American girls were initially slower than both Anglo-American boys and Mexican girls may be due to their relative lack of familiarity with mechanical things and their desire to appear helpless and coy.

Experiment II: Rivalry and Competition

The competitiveness of Anglo-American children at cooperation-competition choice points appears even more formidable in light of their ready cooperativeness in Experiment I. The results of the Cooperation Box experiment are consistent with the cooperation-competition experiments if we assume that when both cooperative and competitive behavior is possible, the intense competitiveness of Anglo-American children masks their motivation and ability to cooperate.

While there is strong evidence to support the hypothesis of Anglo-American competitiveness, the basis of that competitiveness needs explanation. Competitive children in cooperation-competition situations are unwilling to allow their pair-mate a toy even when they have no chance of receiving the toy themselves. Thus the competitiveness of Anglo-American children may be due not only to a strong individual rather than mutual goal orientation, but also to a motivation to worst one's partner. The hypothesis of a strong motivation in Anglo-American children to lower the outcomes of their peers is consistent with the finding that Anglo-American children tend to be strongly oriented toward relative rather than absolute gain (McClintock & Nuttin, 1969).

The nature of Mexican non-competitiveness also needs further explication. Mexican children may appear non-competitive in cooperation-competition situations either because of a simple absence of competitive motivation or because of a reluctance to express competitive or rivalrous behavior. Previous research has placed children in direct social interaction so that motivation to compete may not have found expression because of avoidance of direct competitive social interaction. Direct competitive interaction is considered taboo in at least one Mexican

rural population (Romney & Romney, 1963).

In an attempt to separate absence of competitive and rivalrous motivation from inhibition of such motivation in active interpersonal interaction, the present experiment tested rivalry in a situation relatively free of direct social interaction. To distinguish competition (pursuance of one's own interest in a conflict-of-interest situation) from rivalry (pursuance of negative outcomes for another), competition was operationally defined in the present experiment as taking a toy from another for oneself and rivalry as taking the toy away to prevent one's pair-mate from keeping it.

Method

Subjects. In both Mexico and the United States 32 like-sex pairs, ages 7-9, were randomly assigned to competition and rivalry conditions so that each condition contained 8 pairs of boys and 8 pairs of girls from each culture.

Apparatus. The Circle Matrix Board (Kagan & Madsen, in press) was used in this experiment. The Circle Matrix Board is a 38 cm square playing surface on which are drawn 7 rows of 2.5 cm diameter circles with seven circles to a row (Figure 2). The circles are connected by

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Insert Figure 2 about here

2.5 cm lines along which children can move a marker from one circle to another.

Competition Condition. Children were seated on opposite sides of the Circle Matrix Board. The marker was placed in the center circle (D4).

One child was handed an inexpensive ball point pen and was told, "This is a present for you; you may keep the pen and do anything you like with it."

After the child had time to admire his present, he was asked to put it down by the center circle of the row nearest him (G4). The second child was then informed, "You may move the marker along the lines wherever you want, one circle at a time. You cannot move more than six times. If the marker reaches this circle (G4), you will take (name) pen away from him and keep it for yourself. If the marker reaches this other circle (A4), then (name) will keep his pen. You may move wherever you want."

The second child then moved the marker until it reached either the "take" or "let keep" circle, or until six moves were made. If no goal was reached by six moves, the experimenter stated that since the marker reached neither goal, the first child could keep his pen. After the first trial, the procedure was repeated three times with different toys (magnifying glass, magnet, and ring).

Rivalry Condition. The Rivalry condition was identical to the Competition condition except the second child had no opportunity to keep the first child's present. Instead, the second child was told that if the marker reached the "take" circle, the first child's toy would be taken from him and neither of the children would keep it. When the marker reached this circle, the experimenter simply placed the first child's present out of sight.

Results

In both the Rivalry and Competition conditions, trials ended when the marker reached the "take" or "let Keep" circle or when the six

alloted moves were exhausted. The percentage of each type of response, for subjects in each culture and condition, is presented in Table 2.

Insert Table 2 about here

Because frequency of outcomes were not significantly affected by trials, trials were collapsed in all analyses so that each subject received a score representing the sum of his performance over trials. The Mann-Whitney U test was used for all analyses unless otherwise stated. No significant sex differences were found.

Take. Children in the Competition condition took the toy from the other child more often than children in the Rivalry condition ($p < .001$). Anglo-American children took more often than the Mexican children ($p < .001$). This cultural difference was significant ($p < .01$) in the Rivalry condition, but a trend in the same direction did not reach significance in the Competition condition (See Table 2).

The cultural difference in rivalry is mirrored also in the number of children always or never taking. Seven of the 16 Mexican children and only two Anglo-American children never took a toy in the Rivalry condition ($p < .06$, Fisher test). Six Anglo-American children but only one Mexican child took on all four trials of the Rivalry condition; ($p < .05$ Fisher test).

Let Keep. Children in the Rivalry condition let the other child keep the toy more often than those in the Competition condition ($p < .001$). Mexican children let their pair-mate keep the toy more often than Anglo-American children ($p < .01$). This cultural difference was somewhat greater in the Rivalry ($p < .02$) than in the Competition ($p < .05$) condition.

In the Competition condition seven Mexican and three Anglo-American children ever moved to let the other child keep his toy. In the Rivalry condition 13 Mexican and only five Anglo-American children ever moved to let the other child keep the toy. This difference is significant ($p < .02$, Chi Square).

Avoidance. If children reached neither goal in the six alloted moves, the trial was labeled avoidance. Avoidance was the least common of the three outcomes. More avoidance behavior occurred in the Rivalry than in the Competition condition ($p < .05$). Considering both conditions together, more than twice as many Mexican (12) as Anglo-American (5) children used avoidance on at least one trial. This difference is a significant trend ($p < .10$, Chi Square). The trend toward a cultural difference is indicated by the percentage of avoidance trials in each condition. The cultural difference in frequency of avoidance outcomes is marginally significant only in the Rivalry condition ($p < .10$).

Discussion

In this situation, which involves no active interpersonal interaction, both Mexican and Anglo-American children are quite willing to take a toy away from a peer to keep for themselves. If we accept the generality of this finding, it would mean that previous cultural differences in cooperation-competition situations may not be due to simple absence of competitive motivation in Mexican children. It appears more likely that Mexican non-competitiveness is due to avoidance of conflict in situations involving direct interpersonal interaction.

The results indicate a strong cultural difference in willingness to express rivalry. On 78% of the Rivalry condition trials Anglo-American children took the other child's toy away for apparently no other reason

than to prevent the other child from having it. This rather striking willingness to wors. another is expressed about half as often in the Mexican as in the Anglo-American children.

In the Rivalry condition, Mexican children most often moved to let the other child keep his toy. That 22% of the Mexican trials ended in avoidance, however, suggests that Mexican children often had an impulse toward rivalry to which they did not give full expression. The relative absence of avoidance in the Anglo-American pairs suggests that they experienced little conflict in moving to separate another child from his toy.

Experiment III: Social Interaction in a Rivalry Situation

The results of Experiment II, when examined together with previous research, suggest that Mexican children are competitively motivated, but that they avoid competition which involves direct social interaction. In the third experiment, a rivalry situation was created so that children actively responded to the moves of their peers. It was thus possible to observe the tendency of Mexican children to avoid direct competitive interaction.

The behavior of the Anglo-American children in Experiment II is consistent with the results of cooperation-competition situations and raises the question of how far Anglo-American children will go to reduce the outcomes of a peer. While the present experiment did not examine outcomes worse than losing a toy, it did allow quantification of the extent children would compete in attempting to prevent another child from keeping his toy.

By comparison of the first moves of children in the present experiment with those in the Rivalry condition of Experiment II, it is possible to examine the way in which a responding peer, and the potential for subsequent competitive social interaction, modify initial expression of rivalrous intent.

Method

Subjects and Apparatus. In both Mexico and the United States, eight pairs of boys and eight pairs of girls 7-9 years of age participated. The children were seated, as in Experiment II, on opposite sides of the Circle Matrix Board.

Procedure. The goal contingencies and the method of presentation were the same as for the Rivalry condition of Experiment II. The only differences between the two situations were that in the present experiment children were informed they would take turns moving the marker, and that trials were terminated after a total of 20 moves if no goal were reached. Each pair received four trials. The child without the toy always moved first.

Results

The data were analyzed in three ways. First, analysis was made of the direction of the first move on each trial, and these results were compared with the first moves of the Rivalry condition in Experiment II. Second, the responses to initial "take" moves were examined. Third, as in Experiment II, analysis was made of the frequency of "take", "let keep", and avoidance outcomes. Unless otherwise stated, all analyses were made by the Mann-Whitney U test.

First Moves. Children began each trial with a move in one of three directions: forward, to deny their peer his toy; backwards, to let the peer keep the toy; or sideways, in the direction of neither goal, avoiding the decision. See Table 3.

Insert Table 3 about here

Anglo-American children more often than Mexicans began trials with a move to separate the other child from his toy. Anglo-American pairs made an initial "take" move on 81% of their trials; Mexican children did so on 48%. This cultural difference is significant ($p < .05$). The number of pairs beginning all four trials with "take" moves also reflects the cultural difference in initial intention. More Anglo-American (10) than Mexican (3) pairs always began with "take" moves ($p < .05$, Chi Square).

The tendency for Mexicans to more often begin trials with a sideways move reached only trend proportions ($p < .10$). The tendency for Mexicans to more often begin their trials by moving to let the other child k[illegible] his toy was not statistically significant. Comparison of initial moves of the present experiment with those of the Rivalry condition of Experiment II reveals no significant differences in frequency of any type of initial move for either cultural group.

Response to Initial Take Moves. Fifteen Anglo-American and 12 Mexican children had an opportunity to respond to at least one initial "take" move. The 15 Anglo-American children were forced to respond to initial "take" moves on an average of 3.3 times; the 12 Mexican children were presented with an average of 2.6 initial "take" moves.

Children could make three types of responses to an initial "take" move: 1) Conflict, moving the marker back into the circle from which the other child had just moved, away from the "take" goal; 2) Sideways, moving the marker sideways to the other child's advance; and 3) Submission, moving the marker in the direction of the other child's initial "take" move, toward the "take" goal. The percent of moves in each direction for responding children of each culture is presented in Table 4.

Insert Table 4 about here

Nine of the 12 Mexican children never responded to an initial "take" move with a Conflict move; only one of the 15 Anglo-American children was similarly restrained. This difference is significant ($p < .005$, Fisher test). Such an extreme difference cannot be explained by the fact that Anglo-American children had more opportunities to respond to initial "take" moves.

Most Mexican children preferred to move Sideways rather than make a Conflict or Submission move. Eight of the twelve Mexican children moved Sideways on 75% or more of their responses. Such a high frequency of Sideways responses was observed in only two of the 15 Anglo-American children. This difference is significant ($p < .01$, Fisher test).

In both cultures the least common of all responses to initial "take" moves was Submission. No Anglo-American child ever submitted. Four of the 12 Mexican children responded at least once with Submission; two did so at every opportunity. The cultural difference in number of pairs ever resorting to Submission is significant ($p < .05$, Fisher test).

Trial Outcomes. The most frequent trial outcome for both Anglo-American and Mexican children was to reach neither the "take" nor the "let keep" goal circles (see Table 5). Anglo-Americans reached no goal on 80% of all trials; Mexicans failed to reach a goal on 42%. The cultural difference in frequency of no-goal outcomes was significant (p .02).

Insert Table 5 about here

The intensity of the cultural difference in reaching goals is reflected in the number of pairs always and never reaching a goal. Eight Anglo-American and only three Mexican pairs never reached a goal. Six Mexican and only one Anglo-American pair reached a goal on every trial (p .05, Fisher test).

Anglo-American children reached the "let keep" goal on 9% of the trials; Mexican children did so on 36%. This difference in frequency of "let keep" outcomes is not statistically significant. The difference in number of Mexican (6) and Anglo-American (1) pairs moving to the "let keep" circle more than once, however, is significant (p .05, Fisher test).

Reaching the "take" circle was the rarest trial outcome, occurring on 22% of all Mexican and 11% of all Anglo-American trials. This difference is not statistically significant.

Discussion

The initial response to a rivalrous move and the subsequent interactions differ dramatically in the Mexican and Anglo-American children. In response to another child's initial move to take away a toy, Anglo-American children most often made direct conflict moves. Although the Anglo-American children also sometimes moved Sideways, they never submitted to the rivalrous intent. The Anglo-American refusal to submit to rivalry is analagous to their refusal to be exploited in a Maximizing Difference Game (McClintock & Nuttin, 1969). Mexican children, in contrast, almost always moved Sideways or submitted; they almost never made conflict moves. The avoidant behavior of Mexican children in this experiment is similar to their behavior in cooperation-competition situations (Kagan & Madsen, in press).

The initial responses set the pattern for the remaining moves in both cultural groups. Anglo-American children competed quite actively, with one child attempting to reduce the other's outcomes, and the second child attempting to defend himself. As a group the Anglo-American children made 581 conflict moves, or an average of approximately nine such moves per trial. The Mexican children totaled only 96 conflict moves, or approximately 1.5 per trial.

The presence of active interpersonal interactions in the present experiment reversed the tendency observed in Experiment II for Anglo-American children to more often reach goals. Although Anglo-American children more often than Mexicans made initial moves toward the "take"

goal, the peer willingness to defend their toys by persisting in interpersonal conflict prevented rivalrous children from reaching the "take" goals. Ironically, as a group the Mexicans significantly less often expressed initial rivalrous intentions but non-significantly more often reached the "take" goal. As a group more Mexicans reached the "take" goal because the few consistently rivalrous Mexicans met little opposition; their partners avoided conflict and allowed their toys to be taken away.

That the first moves of both cultural groups did not differ significantly from those of Experiment II indicates that the mere presence of a responding other and the potential for subsequent competitive social interaction does not significantly modify the initial expression of rivalrous intent.

Experiment IV: Avoidance of Conflict

The tendency observed in Experiment III for rural Mexican children to avoid interpersonal conflict has also been noted in anthropological (Romney & Romney, 1963) and experimental (Madsen, 1967; Kagan & Madsen, in press) studies. The fourth experiment represents a more direct attempt to quantify the tendency of children to avoid interpersonal conflict.

To measure avoidance of conflict, children were set off in a direction which would necessarily result in conflict. Children in conflict had the alternatives of avoiding the conflict by moving aside or prolonging the conflict by refusing to move. The experimental situation was structured so that if both children remained in conflict for all of the alloted moves on any trial neither child would obtain the toy for which he was striving. If a child always responded to conflict by stepping aside, however, he also would never obtain any toys.

Thus, in terms of the children's own goals, strategies of uncompromising conflict or compulsive avoidance of conflict were irrational. The experiment therefore allows conclusions about the type and rationality of responses to conflict by children of each culture.

Method

Subjects and Apparatus. In both Mexico and the United States subjects of the experiment were eight boy and eight girl pairs of 7-9 years. The children were seated, as in Experiments II and III, on opposite sides of the Circle Matrix Board.

Procedure. A marker was placed in the center circle of the row nearest each subject (A4 and G4). Subjects were informed that they would take turns, each commanding his own marker. On each turn a subject chose to move his marker or not, stating "move" or "stay". The marker could be moved along the connecting lines to another circle, but it could not enter a circle occupied by the other child's marker.

Before the experimental trials, all subjects practiced taking both "stay" and "move" turns at least three times. After practice, the markers were returned to the middle circle of the row nearest each subject. Subjects' attention was then drawn to eight plastic chips and to a large assortment of toys (ball point pens, puzzles, bracelets, magnets, whistles, etc.). It was explained that later each plastic chip could be traded for one toy. A plastic chip would go to the first child whose marker reached the circle initially occupied by the other child's marker. It was further explained that if neither marker reached its goal by a total of 24 turns for the pair, neither child would receive a plastic chip for the trial. Children alternated moving first for the eight trials.

Because children began by moving their markers toward each other in the direction of their goals, after the first child had completed three turns and the second child had completed two, each marker stood between the other marker and its goal with no circles between them. The second child was then forced either to block the first child's approach by "staying," or to move aside out of conflict. If the second child chose to block, the first in turn was forced to choose between blocking and moving. The number of "stay" or blocking moves made by a pair when their markers each stood between the other marker and its goal with no circles between them is thus a measure of the willingness of the pair to remain in conflict. Because the pair was limited to 24 turns and because it takes five turns for the markers to meet, children could total from zero to 19 blocking moves per trial.

Results

Data from this experiment were analyzed in three ways: amount of blocking, number of toys lost by blocking, and distribution of toys received.

Blocking. All 16 Anglo-American pairs displayed at least some blocking. In contrast, only five of the 16 Mexican pairs ever blocked. This cultural difference in number of pairs ever blocking is significant ($p < .001$, Chi Square). The cultural difference in intensity of blocking is equally significant. No Mexican pair averaged over two blocking moves per trial; 10 Anglo-American pairs averaged over that number ($p < .001$, Chi Square). In total, the Anglo-American pairs averaged 4.5 blocking moves per trial; Mexicans averaged .35 per trial. This difference is significant ($p < .001$, Mann-Whitney U test).

The Anglo-American children appeared increasingly willing to block as trials progressed. Fourteen of the 16 Anglo-American pairs showed more blocking on the second four than on the first four trials. This split-half difference is significant ($p<.005$, Binomial test). Of the five Mexican pairs displaying blocking, three blocked more times on the second four trials. No significant sex differences were observed.

Toys lost. Twelve of the 16 Anglo-American pairs blocked each other sufficiently so that on at least one trial neither child received a toy. Seven Anglo-American pairs lost more than one toy. No pair lost more than three of the eight possible toys. As a group, Anglo-American children lost 22 toys. No Mexican pair lost a boy by blocking. The cultural difference in number of pairs ever losing a toy by blocking is significant ($p < .001$, Chi Square).

Distribution of toys. Eleven Mexican and only two Anglo-American pairs divided the toys with four for each pair member. This difference is significant ($p < .01$, Chi Square). Considering those pairs failing to distribute the toys four each, 12 of the 14 Anglo-American and only one of the four Mexican pairs distributed the received toys within one toy of equality (i.e., so that to make the distribution as equal as possible the child with fewer toys need take only one toy from the child with more toys). This difference is significant ($p < .01$, Fisher test). The two most unequal of all distributions occurred among the Mexican children: in one pair, one child received all eight toys and in another pair, one child obtained seven of the eight toys.

Discussion

In this experiment Anglo-American pairs tended to remain in conflict even when to do so prevented them from getting as many toys as possible.

The number of trials in which neither child obtained a toy may be seen as a measure of the pair's inability to avoid conflict when to do so is in their interest. Given this measure, Anglo-American children are significantly more irrational than Mexican children.

The Mexican children, however, tend to move aside even in the cases when to do so is irrational in terms of their individual interest. In those few cases where one Mexican child blocked in an attempt to receive more than half the toys, the other child seldom resisted, either by blocking or by verbal statements. In such cases the most extremely unequal distributions of toys resulted. Assuming that both children want as many toys as possible, failure of one child to block another from taking more than half the available rewards is irrational in terms of self interest. Thus, considering those pairs in which some blocking occurs, the extent the received toys are distributed less equally than possible is a measure of irrational avoidance of conflict. Given this measure, Mexican children are irrationally avoidant. The blocked Mexican child appeared to move aside automatically. In two Mexican pairs both children moved aside even though it was necessary for only one to do so. This tendency for compulsive avoidance in the Mexican children is consistent with the results of Experiment III and previous experiments (Madsen, 1967; Kagan & Madsen, in press).

Among the Anglo-American children, every time one child attempted to obtain more than half the toys by blocking, the other child blocked in return. The willingness of Anglo-American children to block had a leveling effect which prevented the extremely unequal distribution of toys sometimes observed in the Mexican pairs. Sometimes, as noted, blocking led Anglo-American children to lose toys, but other times

blocking was part of a heated interaction which allowed a just resolution of conflict. For example, when two Anglo-American girls had both "stayed" for some turns, the girl with fewer toys shouted at the other, "You pig! You try to grab everything." The girl with more toys thereupon moved aside.

Spontaneous verbal comments and informal discussion with the children after the experiment revealed an interesting difference in the way children of each culture conceptualized the experimental situation. When Anglo-American children were asked why they moved aside in the conflict situation, they most often phrased their response in terms of self-interest (eg., "so I can get a chip next time"). The Mexican children never responded in terms of self-interest. When asked why they moved aside in the conflict situation, Mexican children most often responded, "to let him pass."

General Discussion

Previous research has tended to show the irrational competitiveness of Anglo-American children in contrast with the rational cooperativeness of the Mexicans. The present four studies present a more balanced picture, demonstrating that the children of both cultures are, each in a different way, systematically irrational.

The irrational competitiveness of the Anglo-American children, while not as intense as at cooperation-competition choice points, is seen in Experiment IV. Taken as a pair, the Anglo-American children behave irrationally: they remain in conflict to an extent which denies them toys for which they are striving. The extreme rivalry of the Anglo-American children in Experiments II and III aims at decreasing their pair-mate's outcomes without increasing their own. That almost all

Anglo-American children find it reinforcing to lower the outcomes of their peers, throws into question the quality of peer interaction in the Anglo-American culture.

The Mexican children appear irrational in the opposite direction. In Experiment III a significant proportion of Mexican children made no attempt to defend their toy against the advances of a rivalrous peer. The Mexican child's submission to the peer's attempts to lower his outcomes is irrational in terms of self interest. Those Mexican children in Experiment IV who allowed their peers to take all or almost all the toys demonstrated compulsive rather than rational avoidance of conflict.

The present experiments demonstrate that Mexican children tend to avoid and Anglo-American children tend to remain in conflict to an irrational extent. That each culture is producing children who are systematically irrational in opposite directions suggests the possibility of cultural therapy. The present experiments have made no attempt to determine the institutions and child-rearing practices responsible for the observed cultural differences. If causal relations can be established, however, the possibility exists of making systematic changes which would provide children of both cultures alternatives to irrational behavior.

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Footnotes

1. This research was carried out through the UCLA Center for Research in Early Childhood Education, sponsored by the United States Office of Economic Opportunity, Contract No. CG 9938, Dr. Carolyn Stern, Director.

2. Requests for reprints should be sent to the authors, Psychology Department, University of California, 405 Hilgard Avenue, Los Angeles, California, 90024.

Figure Captions

Figure 1. (a) Training Box, (b) Cooperation Box

Figure 2. Circle Matrix Board

Table 1

Mean Seconds to Solution in Cooperation and Help Conditions as function of Culture, Age, and Sex (trials collapsed)

	Cooperation Condition		Help Condition	
Age & Sex Groups	Anglo-American	Mexican	Anglo-American	Mexican
7 - 9 Boys	2.8	8.9	8.0	13.6
7 - 9 Girls	5.5	1.8	9.9	6.4
10 - 11 Boys	2.8	3.7	5.0	11.8
10 - 11 Girls	5.8	1.5	4.5	3.2

Table 2

Experiment II Trial Outcomes: Percentage of Take, Let Keep, and Avoidance in each Condition by Culture (trials collapsed)

	Competition Condition			Rivalry Condition		
	Take	Avoid	Let Keep	Take	Avoid	Let Keep
Anglo-American	92	3	5	78	8	14
Mexican	77	9	14	36	22	42

Table 3

Experiment III Initial Moves: Percent of Take, Let Keep and Avoidance in Each Culture (trials collapsed)

	Take	Avoidance	Let Keep
Anglo-American	81	16	3
Mexican	48	38	14

Table 4

Experiment III Responses to Initial Take Moves: Percent of Conflict, Sideways, and Submission in Anglo-American and Mexican Children (trials collapsed)

	Conflict	Sideways	Submission
Anglo-American	72	28	0
Mexican	14	65	21

Table 5

Experiment III Trial Outcomes: Percent of Take, Let Keep, and No Goal Outcomes in each Culture (trials collapsed)

	Take	Let Keep	No Goal
Anglo-American	11	9	80
Mexican	22	36	42

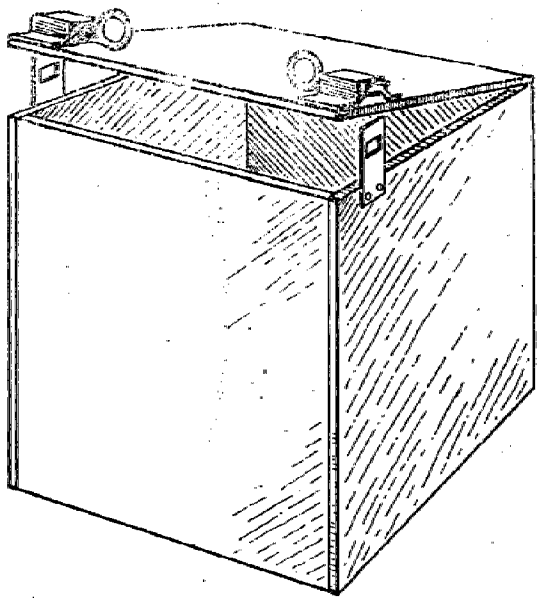

FIGURE 1a
TRAINING BOX

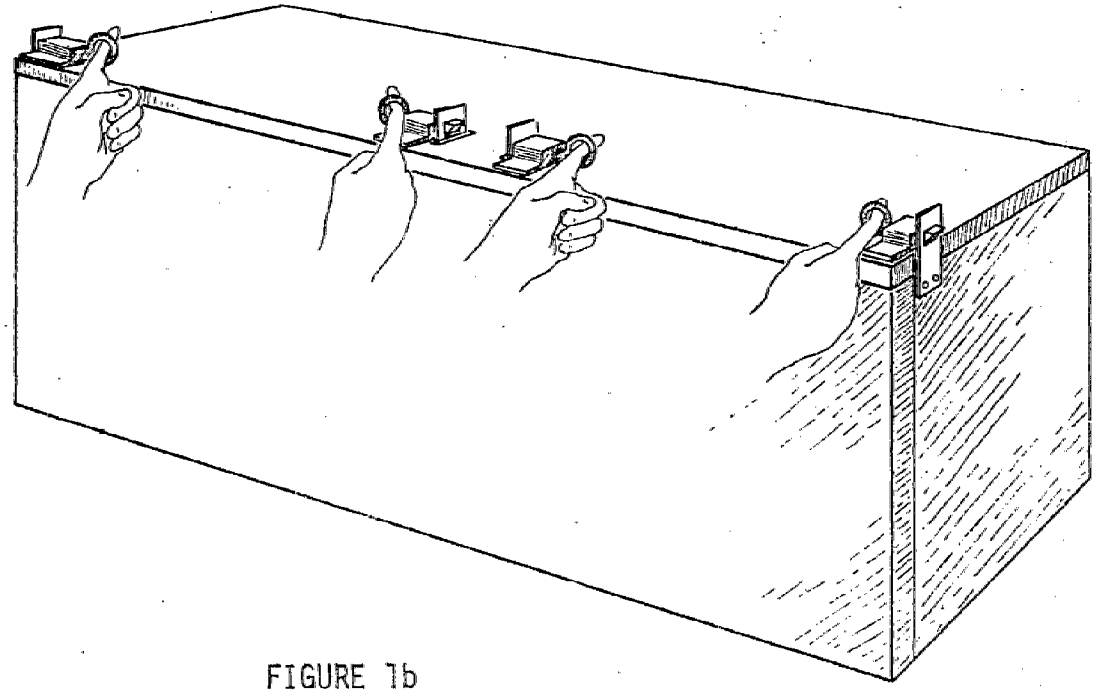

FIGURE 1b
COOPERATION BOX

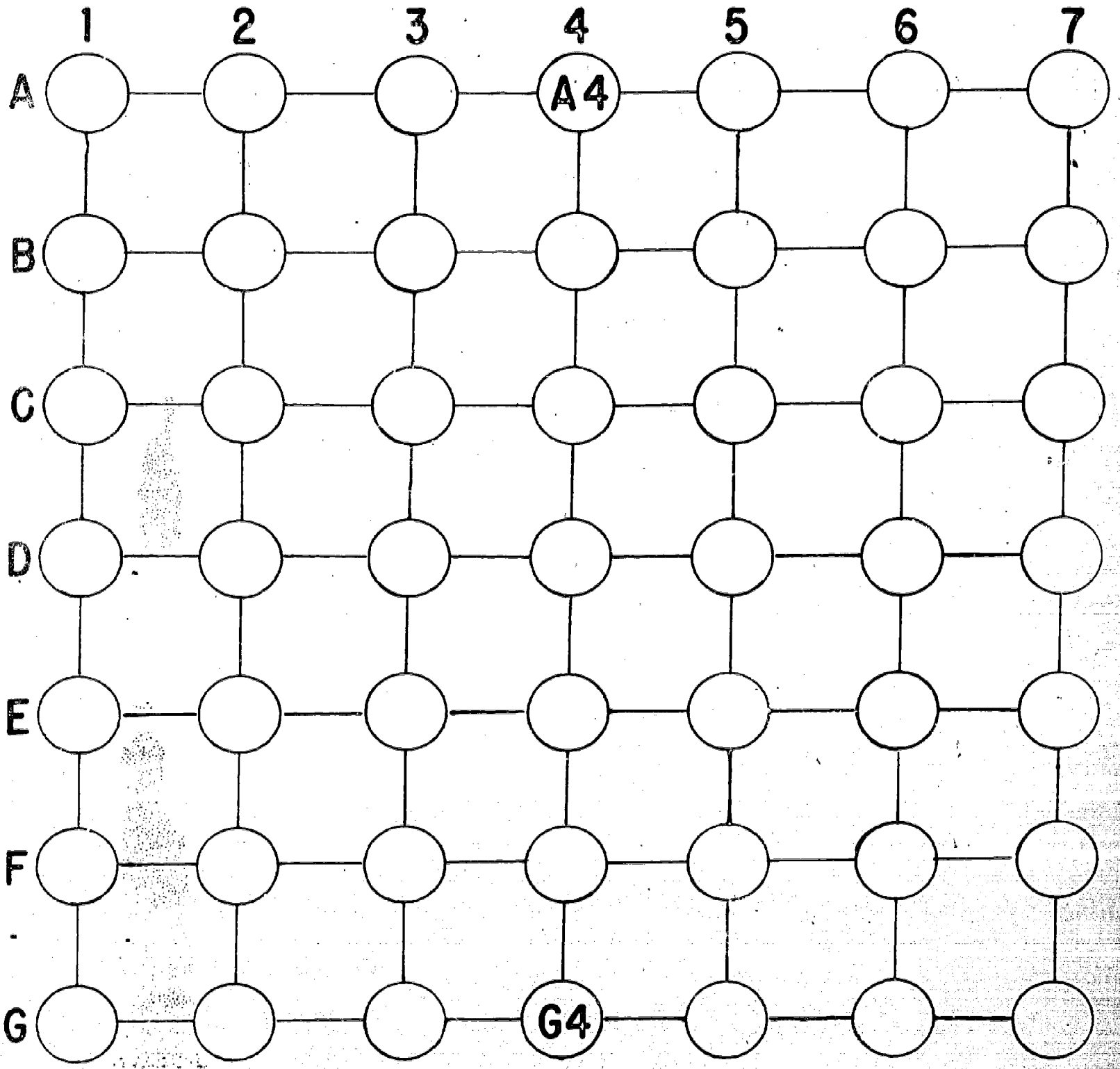

FIGURE 2
CIRCLE MATRIX BOARD