

Social Constraints on Naturally Occurring Preschool Altruism

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Social interaction among 26 children ranging in age from three to five years was videotaped for 30 hours during free play at a University preschool. Altruistic exchanges were identified from these tapes and coded into one of 16 categories. Approximately 1200 exchanges were observed. Nearly 60% of observed altruism was directed toward peers and 40% toward teachers. The degree of generality in children's altruistic behavior depended strongly on whether such activity was directed toward peers or teachers, and on whether the peer was a friend. A strong relationship was evident between individual rates of initiated and received altruistic behavior. These findings were related to previous experimental research on young children's "prosocial" behavior, and discussed with reference to both psychological and sociobiological conceptions of human altruism.

Key Words: Social constraints; Altruism.

INTRODUCTION

Psychological studies of young children's "prosocial behavior" have burgeoned over the last

several years as researchers have begun to investigate the causes and correlates of helping, rescuing, cooperating, and giving activities. In their reviews of this literature, Bryan (1975) and Rushton (1976) noted that the vast majority of these studies were not designed to examine children's normative altruism as it occurs in everyday settings. As a result, several questions remain unanswered from the type of laboratory research which has become characteristic in social psychology. For example, in what kinds of altruistic activities do children engage when left to their own resources? In a natural setting are some children generally more altruistic than others? What are the relative distributions and interrelations among spontaneously occurring altruistic behaviors? To whom are such behaviors directed? Are they reciprocated? Answers to these questions can only be obtained through the use of naturalistic research methods.

Tentative beginnings to the study of children's naturally occurring altruism have already been made. For example, Yarrow and Waxler (1976) recorded helping, sharing, and comforting activities of 77 nursery school children. These same children were also tested in six experimental situations embedded as naturally as possible in a play session with an adult experimenter. In both settings, helping was the most frequent form of prosocial response. Assess-

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ments of individual differences in engaging in these three prosocial activities indicated that there was not a tendency for some children to be generally more altruistic. From these observations, it was not possible to predict individual differences in any one category of altruism from scores on either of the other two behavioral measures. As Rushton (1976) emphasized, these preliminary naturalistic findings seem to corroborate previous laboratory results which strongly indicate that individuals cannot be differentiated according to their general likelihood of being altruistic, but rather that the occurrence of altruistic activities is strongly determined by specific aspects of the immediate situation.

However, at least three interpretations of such apparent specificity in naturally occurring prosocial behavior seem tenable. A *social specificity* hypothesis would emphasize the identity of the participants in a social exchange and the nature of the relationship which they have established prior to the potentially altruistic episode. This interpretation would predict that substantially higher correlations between individual rates of prosocial actions would be evident if the persons benefitting from such behaviors were distinguished according to their relationship with the young "altruist." This interpretation seems most compatible with sociobiological theories of prosocial behavior (Hamilton, 1964; Trivers, 1971; Wilson, 1975) which stress that relationships between individuals provide constraints on the likelihood of altruistic action. From this perspective, one would assume that altruism directed toward peers may differ from prosocial activity directed toward adult caregivers in terms of both its causation and function. Such differences could easily lead to the reportedly low predictability between different forms of prosocial behavior that have been observed in both laboratory (Rushton, 1976) and natural settings (Yarrow and Waxler, 1976).

A second interpretation of specificity in prosocial behavior, *response specificity*, might emphasize the situational factors immediately preceding or within an interaction sequence which signal that some form of altruistic response is appropriate. Differences between children in the recognition of specific cues for different forms of altruism could lead to the emergence of differences in individual response styles. The existence of such response styles could certainly explain the relatively low correlations that have

been reported between individual rates for different forms of prosocial activity. However, this view of response specificity in early altruism would also predict reasonably high test-retest measures of temporal stability in individual rates of specific altruistic activities. Essentially, the response specificity view implies that each child develops and maintains a consistent behavioral style for the expression of his altruistic tendencies.

Finally, the strong *situational specificity* hypothesis would emphasize concomittant variations in both social and physical settings which ultimately control the likelihood of altruistic activity. This hypothesis would predict low correlations between forms of prosocial behavior regardless of the social target, as well as low test-retest measures of stability in altruistic action. It seems clear that most of the data from experimental research in social development strongly supports this latter hypothesis (Rushton, 1976). However, these data do not permit an adequate evaluation of the response specificity and the social specificity hypotheses. Such an evaluation requires a naturalistic assessment of prosocial behaviors in a socially stable setting. The present research was designed to provide both a more comprehensive description of spontaneously occurring prosocial behavior and to evaluate the possible sources of specificity in young children's altruism.

METHOD

Participants

The participants were 26 children ranging in age from three to five years ($M = 51.35$ months, $SD = 7.12$) who attended the Early Childhood Education Centre at the University of Waterloo. With the exception of one Oriental boy, the children were all Caucasian. All children were from working or professional families.

Procedure

The children were videotaped at the preschool for one hour daily (9:30 to 10:30 AM) during their free-play period. Records were obtained five days each week, for six weeks during January to March of 1975. The preschool setting consisted of one large playroom and two smaller special activity rooms. The large playroom,

which was used by most of the group during free-play periods, was equipped with three video cameras and concealed microphones. The video cameras were permanently mounted in an inconspicuous fashion. Consequently, both teachers and children at the center had had at least four months of exposure to the apparatus prior to the observational period. The behaviors from the 30 hours of tape were coded using the behavioral inventory described below. Since each child was not necessarily in the observation room for the same length of time (because the two other rooms were available during free play periods), supplementary records of specific children present during every three-minute interval throughout all tapes were also obtained. These latter observational records allowed calculation of the total time that each child was available for social observation. A ratio of frequency of prosocial acts in each category to time observed provided estimates of specific behavioral rates for each child.

Behavioral Inventory

Eleven categories of child-directed behavior and five categories of teacher-directed behavior were developed from preliminary analysis of the video tapes. These mutually exclusive categories were organized into four general classes of activity. The first class, *Object Related Activity*, included the following five behavioral categories. *Sharing with peer* was defined as alternate possession of an object by two or more children. This category included instances where an object was repeatedly handed back and forth, but the complete sequence was coded as a single example of sharing. *Offering object to peer* included attempts to give an object which were refused or ignored. *Allowing object to be taken* was defined as not resisting if an object was taken by another child. This category was not scored if the social episode included any type of antagonistic gesture (Strayer and Strayer, 1976). *Object donation to peer* entailed giving an object to a child without being specifically asked to do so. *Object donation to teacher* differed from the peer-directed category only because of the target.

The second class of behavior concerned *Cooperative Activities*. It consisted of the following four behavioral categories. *Task cooperation with peer* was defined as working together to

achieve a common goal, as in unpacking a box of toys, or moving furniture within the playroom. These activities usually preceded the onset of a particular play episode. *Play cooperation with peer* included cooperative activities which occurred during the course of play. Examples include mutually building a block structure, or setting a table for tea. *Task cooperation with teacher* was defined as cooperating during the post-play clean-up period without being requested to do so. *Directed cooperation with teacher* was similar to the previous category, but the cooperation was preceded by a direct request from the teacher.

Helping Activities comprised the third general class of behavior. Helping was distinguished from cooperation because the specific activity of the helper differed from that of the recipient. The class of helping activity was also divided into four specific behavioral categories. *Task help to peer* was defined as assisting another child to accomplish some goal, as in putting on a smock, or doing up buttons. *Play help to peer* included any helpful activity during episodes of play, as in holding a ramp for another child during a racing car game, or pulling someone in a wagon while playing a fireman game. *Task help to teacher* usually included assistance in preparation for specific activities such as moving play equipment or fetching materials. *Directed help to teacher* differed from the previous category in that the assistance was preceded by a direct request from the teacher.

The final class of altruistic behavior concerned *Empathic Activity*. This class was divided into three mutually exclusive categories. *Look at upset peer* included any visual orientation toward a distressed child. *Approach upset peer* entailed orientation and locomotor activity which brought a child closer to a distressed peer. Finally, *comfort upset peer* required an additional behavioral activity which seemed intended to lessen the discomfort of a distressed child.

The reliability of this coding system was assessed in two ways. First, three trained observers independently coded the same hour of videotaped free-play interaction among preschool children. Agreement coefficients between observers for the complete coding system were calculated by dividing total agreements by agreements plus disagreements. The resulting coefficients were 0.76, 0.82, and 0.86. In addi-

tion, since our research questions focused upon individual differences in rates of altruistic behaviors, a second reliability check was conducted to compare rate estimates obtained by two independent observers coding ten minutes of video-taped free play for each of twelve subjects. The obtained correlation coefficients were 0.90 for object activity, 0.87 for cooperation, 0.89 for helping, 1.00 for empathy, and 0.90 for the complete inventory.

RESULTS

The Distribution of Prosocial Behavior

A total of 1,195 altruistic events were coded from the video records of free play. Thus, nearly 40 examples of the behaviors defined by the present inventory were observed during a typical hour of play at the preschool. Approximately 60% (714) of these behaviors were directed toward peer-group members, while 40% (481 behaviors) were directed toward teachers. These relative percentages reflect to some extent the relative availability of peers and adults as potential targets for prosocial behavior. Typically, only two or three teachers were present to supervise the activities of 10 to 12 children during free-play periods.

Table 1 shows both the absolute and relative frequencies for each behavioral category, as well as the mean individual rate of initiation during the course of the observations. These data provide a general picture of the distribution of naturally occurring prosocial activity without intervention, or provocation, by an agent external to the social ecology of the stable group. Within the peer-directed behaviors, 40% of the observed activity was object related. Cooperative behaviors comprised about 35% of peer-directed prosocial activity. Both helping and empathic activities occurred far less frequently. The former class comprised nearly 20% of peer-directed behavior, while the latter accounted for less than 10%. Among teacher-directed activities, cooperation was observed most frequently. Both helping and object-related activities were directed less often to teachers. These latter two classes each accounted for about 15% of teacher-directed behaviors.

CONSISTENCY AND STABILITY OF PROSOCIAL ACTIVITY

In order to provide a summary of the degree of association between the observed forms of altruistic behavior, separate rate measures which

Table 1. Summary of Observed Altruistic Activity

Behavioral Categories	Observed Frequency	Percent of Total Activity	Mean Individual Rate per Hour
<i>Object Related Activity</i>	362	30%	7.60
Shares with Peer	36	3%	0.64
Offers Object to Peer	36	3%	0.58
Allows Object to be Taken	48	4%	0.94
Object Donation to Peer	167	14%	3.45
Object Donation to Teacher	75	6%	1.99
<i>Cooperative Activity</i>	581	49%	6.66
Task Cooperation with Peer	126	11%	1.34
Play Cooperation with Peer	118	10%	1.19
Task Cooperation with Teacher	262	22%	3.34
Directed Cooperation with Teacher	75	6%	0.79
<i>Helping Activities</i>	197	16%	0.94
Task Help to Peer	74	6%	0.33
Play Help to Peer	54	5%	0.18
Task Help to Teacher	49	4%	0.30
Directed Help to Teacher	20	2%	0.14
<i>Empathic Activities</i>	55	5%	0.46
Look at Upset Peer	31	3%	0.32
Approach Upset Peer	20	2%	0.14
Comfort Upset Peer	4	0%	0.01
<i>Total</i>	1195	100%	15.56

Note: Since rates were calculated according to total observation time for each individual, these means are not directly comparable to either frequency or percent scores.

Table 2. Intercorrelations for Rates of Peer and Teacher Directed Classes of Prosocial Activity

Behavioral Class	1	2	3	4	5	6	7
1 Peer Object Activity	—						
2 Peer Helping	0.62 ^a	—					
3 Peer Cooperation	0.52 ^a	0.42 ^b	—				
4 Peer Empathy	-0.15	-0.36	-0.33	—			
5 Teacher Object Activity	0.20	-0.01	-0.01	-0.05	—		
6 Teacher Helping	-0.16	-0.04	-0.12	-0.09	0.51 ^a	—	
7 Teacher Cooperation	0.31	0.23	0.56 ^a	-0.22	-0.17	-0.46	—

^a $p < 0.01$, $df = 24$, one-tailed test.

^b $p < 0.05$, $df = 24$, one-tailed test.

differentiated both the type of activity and class of social target were computed for each child. The resulting intercorrelations between individual rates of different altruistic behaviors are shown in Table 2. With the exception of empathic activity, the classes of peer-directed behavior were all significantly intercorrelated. In addition, the rate of object activity directed toward the teachers correlated significantly with the rate of directing help to the teachers. Finally, the only significant relationship between peer-directed and teacher-directed behaviors was within the class of cooperation. This latter correlation reflects the strong relationship between *Play cooperation with peer* and *Directed cooperation with teacher*. Children who frequently engaged in cooperative play were quite often asked by teachers to participate subsequently in the replacement of toys and materials during the clean-up period. The relative magnitude of correlations between classes of behavior distinguished according to type of social target provide strong support for the social specificity interpretation of earlier findings. The cluster of significant correlations within these two social contexts argues against both the response specificity and situational specificity accounts of children's prosocial behavior in the present setting.

To assess the extent to which children maintained stable levels for specific forms of altruistic behavior, individual rate scores for each class of prosocial activity were calculated separately for each three-week observational interval. Five children who were not observed for at least 30 minutes in each of these two periods were not included in these analyses. Table 3 shows temporal stability coefficients obtained for each class of prosocial activity and for the total rate of initiated altruism. Once again, these indices

are separated according to the type of social target. Within peer-directed behaviors, object related and cooperative activity, as well as total rate of initiated altruism, showed modest but significant stability. Stability coefficients for helping and empathic activities were not statistically significant. However, it should be emphasized that the frequency of these latter two classes of activity were substantially lower than either object or cooperative activity in each half of the study. Consequently, split-half estimates of individual rates are probably less reliable for these less frequent activities than for the other two forms of prosocial behavior. Finally, helping activities directed toward teachers showed significant stability during the observational session, but the remaining teacher-directed behaviors were not predictable from one half of the sampling period to the next. In general, although the present results indicate moderate temporal stability in only three forms of altruistic behavior, stronger evidence for the stability of prosocial response styles may be found using more extensive, long-term sampling procedures.

Table 3. Temporal Stability of Altruistic Activities^a

Behavioral Class	Social Target	
	Peers	Teachers
Object Activity	0.40 ^b	0.07
Cooperation	0.36 ^b	0.23
Helping	0.22	0.42 ^b
Empathy	0.29	—
All Behaviors	0.41 ^b	0.06

^a Pearson correlation coefficients between rates of behavior during each half of the total observational period.

^b $p < 0.05$, $df = 20$, one-tailed test.

Social Specificity and Reciprocity

The social specificity in preschool altruism was also reflected in the finding that prosocial behaviors of each child were directed toward an average of only 5.4 other group members. Furthermore, when only those social targets who received at least two altruistic acts are included, this average drops to 3.4 children. Thus, although there were 25 other group members who potentially could receive altruistic behaviors, and usually about 10 children immediately available for any given altruistic act, the typical child in the present sample directed the majority of altruistic activity to less than four other members of the peer-group.

Some insight into the nature of this social specificity in naturally occurring preschool altruism was provided by comparing prosocial initiations and friendship patterns within the group. Figure 1 shows sociometric representations of altruistic and affiliative preferences for specific children in our sample. The affiliative preferences represent the frequency of dyadic approaches that were observed in an independent study conducted during the same period at the preschool center (Strayer, 1978). The arrows in the sociogram point to the particular group member to whom most of the altruistic or approach behaviors were directed by each child.

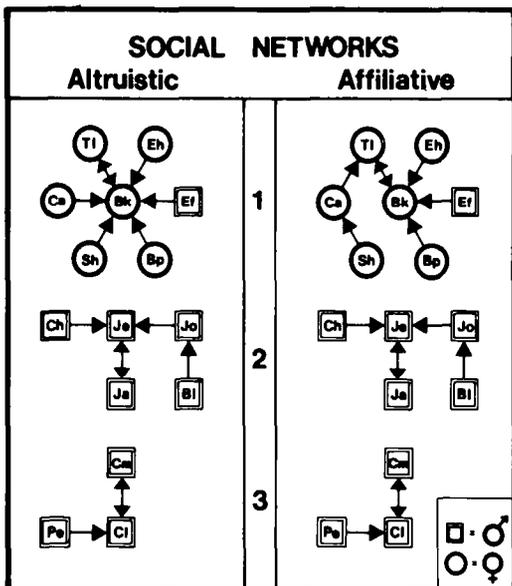


Figure 1. Sociometric representation of altruistic and affiliative preferences.

From these social networks it is evident that in 13 of the 15 cases where both types of information were available, children directed most of their altruistic and approach activity to exactly the same peer-group member. In the two cases where affiliative and altruistic preferences differ, there was still some indication that the frequency of these two activities corresponded. Both Sh and Ca played together most often with other girls in their social network; thus, they were in general proximity to Bk (their altruistic preference) more often than to children from the other two subgroups.

The sociograms in Fig. 1 also provide preliminary descriptive evidence for the general reciprocity of preschool prosocial behavior. Bk, who is the central child in the female subgroup, initiated and received the greatest number of altruistic behaviors during the course of the study. Similarly, the two central children in the remaining social networks, Cl and Je, were both above average in the rate with which they initiated and received prosocial activity. A more precise index of the degree of general reciprocity was obtained by correlating individual rates of initiated and received activity. The resulting coefficient was 0.46 ($p < 0.01$, $df = 24$). Finally, in order to examine the temporal constraints on such reciprocity, separate correlations were computed between initiation and receipt of altruistic behaviors during each half of the study. These analyses showed a similar level of reciprocity within each three week observational period ($r = 0.42$, $p < 0.05$ for Weeks 1-3; $r = 0.53$, $p < 0.01$ for Weeks 4-6). Inter-correlations between rate of initiating altruism during one half of the study and receipt of altruism during the other were substantially lower (both $r_s = 0.28$, n.s.). These final results indicated that the likelihood of receiving altruistic actions was better predicted by a child's current rate of being altruistic than the child's past altruistic record or subsequent altruistic performance.

However, we should emphasize that these general indices of altruistic reciprocity do not necessarily imply the existence of reciprocal dyadic relationships which govern altruistic exchange. The analysis of dyadic altruistic relationships requires the use of more elaborate sampling procedures which focus upon the dyad as a basic unit of study. These procedures would permit calculation of the actual interaction time

available to each dyad, and thus permit quantitative analysis of dyadic differences in rates of altruistic exchange. Given the present results, such an analysis seems an important, and perhaps necessary step in future studies of naturally occurring altruism.

DISCUSSION

The Nature of Preschool Altruism

The present study provides a much needed supplement to existing information on the nature of young children's prosocial behavior. Previous research has focused primarily upon theoretical interpretations of how socialization processes (Rushton, 1976) or cognitive abilities (Yarrow and Waxler, 1976) might determine individual differences in altruistic behavior. Typically, because of their theoretical focus, such studies have not examined the full range of questions which might be posed concerning the diversity and the organization of prosocial activity. By adopting a more ethological research strategy, the present investigation provides a more thorough descriptive analysis of altruistic activity in a natural social setting. The initial results of our research suggest that the observed frequency of prosocial behaviors far exceeded the levels reported in earlier experimental or observational research. In fact, the number of altruistic exchanges observed at Waterloo exceeded the number of dominance exchanges which were recorded during the same period (see Strayer, 1978). The greater number of prosocial acts observed in the present study probably reflects our emphasis on the development of a more finely differentiated behavioral inventory, as well as our use of video coding procedures. Frequently, social events which may have been omitted due to ambiguity under conditions of direct observation were repeatedly viewed and ultimately coded from the video record. Thus, the present estimates of relative frequency and mean rates of different prosocial behaviors probably provide a more accurate picture of the actual distribution of spontaneously occurring preschool altruism. However, it is important to stress that both the distribution and the organization of prosocial activities within other preschool groups will probably vary as a function of various factors in the social and physical ecology of the peer group. Research investigating the effects of

such contextual parameters could provide important information for programs which attempt to enhance the absolute rate of prosocial behaviors among young children.

A second important contribution of the present research concerns the development of more specific measures related to the organization of altruistic activity within the stable peer-group. Our evaluation of social specificity and individual reciprocity in preschool altruism suggests that a variety of qualitative measures can be developed for the description of organizational patterns in social behavior. Such measures are not necessarily derived from simple arithmetic transformations of either absolute frequency or individual rate of observed activity. Although the specific measures employed in the present report are not highly refined as descriptive indices, it seems clear that conceptually similar measures should be developed for future observational research. Perhaps more importantly, since such measures permit an objective description of the organization of prosocial behavior, they may provide interesting and fruitful dependent variables for more traditional research concerning the psychological and developmental antecedents of childhood altruism.

Our results also suggest important directions for future ethological analyses of naturally occurring altruism. Most importantly, it seems essential to design future observational studies using procedures which will permit a direct evaluation of the dyadic distribution and dyadic reciprocity in preschool prosocial behavior. Although the present results clearly demonstrate substantial discrimination by preschool children in the selection of recipients for altruistic activity, as well as a high correlation between the total acts given and the total acts received by each child, our present methods did not permit an analysis of dyadic altruistic relations within the group. However, the strength of our preliminary findings concerning social constraints on early altruism certainly suggests the need for a more complete dyadic analysis of preschool prosocial activity.

A second important direction for future research dealing with naturally occurring altruism should include the development of a more refined inventory for prosocial interaction. Such an inventory would permit identification of recurrent behaviors which characterize the activity of both participants in an altruistic exchange.

By monitoring the complete social interaction, before and after the altruistic act, it may be possible to determine which behaviors function to signal the appropriateness of different forms of altruism, as well as which behaviors serve to maintain and reward the altruist's intervention.

Theoretical Considerations

The reported relationships between classes of prosocial behavior have important implications for the psychological analysis of *generality* versus *specificity* in young children's altruism (Rushton, 1976). The cluster of significant correlations among classes of peer-directed activity indicates that the degree of behavioral generality in this specific social context was sufficiently high to warrant discussing general individual differences in tendencies to engage in peer altruism. Similarly, the intercorrelation between two of the teacher-directed activities suggests some generality within this second social context. However, in both cases the generality of prosocial behavior was constrained by the age-class (teacher or peer) of the social target. In either social context some children showed more of a tendency to be altruistic. However, children who were altruistic toward adults were not necessarily the same children who were altruistic toward their peers.

Stronger evidence for the social specificity of early altruism was provided in the analysis of most preferred targets for peer-directed behavior. The limited range of peers who received the majority of prosocial initiations indicates that children discriminate among group members and direct their altruistic activity to a small group of specific individuals. This demonstration of social specificity in naturally occurring preschool altruism poses serious questions concerning the validity of experimental procedures which have purported to measure a child's altruistic proclivities by offering the opportunity to help, rescue, or give to a complete stranger or an imagined charity. Hopefully, future experimental analyses will pay greater attention to specific ecological factors within the natural social context of their subjects. From a sociobiological perspective, such social ecological factors should provide the most powerful constraints on the altruistic behavior of both children and adults.

The degree of specificity and reciprocity in preschool altruism also has interesting implica-

tions for sociobiological analyses of human altruism. Although from an evolutionary or phylogenetic perspective, altruism has been explained in terms of inclusive fitness through kin selection (Hamilton, 1964), or norms of reciprocity (Trivers, 1975), the proximal mechanisms which lead to the discrimination of particular conspecifics as the most probable recipients of altruistic action may be found in the course of individual development. At the level of kin selection, the mediating discriminative processes are probably linked to the development of the affectional systems which underlie familial attachments. In the environment of human adaptedness, genetic relatedness and the development of individual social preferences would have overlapped substantially. Thus, the emergence of kinship altruism would have corresponded to the emergence of discriminative altruism toward conspecifics with whom an affectional bond had been developed. A person's willingness to engage in self-sacrificial actions for another group member might have varied with the degree of the recipient's genetic relatedness, but such actions probably were determined more by the nature and quality of the prevailing social relationship between the altruist and the recipient.

The dependence of kinship altruism upon the emergence of social bonds during individual ontogeny provides an interesting, and perhaps necessary, basis for the evolution of reciprocal altruism. When social bonds developed among nonrelated conspecifics, there would still have been a proximate motivational (i.e., affectional) basis for individuals to engage in altruistic acts. The biological value of such actions would have varied as a function of the altruist's ability to accurately determine whether the conspecific really adhered to a norm of reciprocity, and to constrain his own actions accordingly. The information necessary for such a decision must have been acquired through extensive but less costly social experience with particular conspecifics during the course of social development. In this sense, the reciprocity in young children's prosocial behavior during play may provide important information for the developing child which allows the formation of discriminative, but realistic, expectations concerning the probability that peers will reciprocate personal generosity. The exchange of such information early in development may be necessary for the for-

mation and stabilization of prototypic social relationships which provide natural constraints for the majority of adult altruistic behavior.

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REFERENCES

- Bryan, J.H. Children's cooperation and helping behaviors. In *Review of child development research*, E.M. Hetherington (Ed.). Chicago: University of Chicago Press, 1975, Vol. 5.
- Hamilton, W.D. The genetical theory of social behavior. *Journal of Theoretical Biology* 7: 1-52 (1964).
- Rushton, J.P. Socialization and the altruistic behavior of children. *Psychological Bulletin* 83: 898-913 (1976).
- Strayer, F.F. L'organisation sociale chez des enfants d'âge préscolaire. *Sociologie et Société*, 10: 43-64 (1978).
- Strayer, F.F., Strayer, J. An ethological analysis of social agonism and dominance relations among preschool children. *Child Development* 47: 980-989 (1976).
- Trivers, R.L. The evolution of reciprocal altruism. *Quarterly Review of Biology* 46: 35-57 (1971).
- Wilson, E.O. *Sociobiology: the new synthesis*. Cambridge, MA: Harvard University Press, 1975.
- Yarrow, M.R., Waxler, C.Z. Dimensions and correlates of prosocial behavior in young children. *Child Development* 47: 118-125 (1976).