


1985

## Sharing as a function of the number of play materials

Nancy Carol Milstead  
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AN ABSTRACT OF THE THESIS OF Nancy Carol Milstead for the  
Master of Science in Psychology presented April 5, 1985.

Title: Sharing as a Function of the Number of Play  
Materials.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:



Cathleen Smith, Chairman



Chadwick Karr



Adriane Gaffuri *JM*

This study examined whether the number of available  
play materials (toys) affected the occurrence of sharing  
behavior in preschool children. Eighteen four- and five-  
year-old children were assigned by age and gender to six

same-sexed groups of three children each and were observed during three, 10-minute observation sessions. All groups were observed playing with one toy, two toys, and three toys. The children's play activities with the toy(s) were videotaped, and a behavioral coding system was developed to record those behaviors. The effect of toy condition on the sharing categories of Asked-for-Share, Partial Share, Overall Share (a category combining the highly correlated behaviors of Asked-for-Share and Spontaneous Share), and Spontaneous Share was analyzed. Age and gender were found to be unrelated to sharing. Only the effect of toy condition on Overall Share was statistically significant. Further analysis revealed that the three-toy condition affected the occurrence of Overall Share by reducing the amount of sharing. Implications for further research were discussed.

SHARING AS A FUNCTION OF THE NUMBER OF PLAY MATERIALS

by

NANCY CAROL MILSTEAD

A thesis submitted in partial fulfillment of the  
requirements for the degree of

MASTER OF SCIENCE  
in  
PSYCHOLOGY

Portland State University

1985

TO THE OFFICE OF GRADUATE STUDIES AND RESEARCH:

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## CHAPTER I

### INTRODUCTION

The increasing complexities of modern society and a growing population have necessitated identifying those conditions which will promote prosocial or altruistic behavior, i.e., behavior which benefits other people. One of the basic issues is to identify those variables which may facilitate the development of such behavior, particularly in children. Hundreds of studies have been published in recent years detailing these factors, and although some conclusions can be drawn, there are many studies reporting inconclusive and contradictory findings (Mussen & Eisenberg-Berg, 1977).

It is important to define the terms prosocial and altruistic, since both terms are used throughout the psychological literature. This differentiation is important, since the choice of term may determine the type of research conducted and consequently the results reported (Rushton & Sorrentino, 1981). Prosocial and altruism have both been defined by theorists as acts benefiting another person (Gelfand & Hartmann, 1980). Altruism is further conceived to consist of those behaviors which benefit others without the actor's expectation of external reward. Research resulting from this perspective has involved

investigation of the actor's intentions and motivations in benefiting others and includes assessment of an individual's private thoughts and feelings, events that are difficult, at best, to verify (Gelfand & Hartmann, 1980). Eisenberg (1982) suggests that the term prosocial be used to designate behaviors which benefit others, appear voluntary and intentional, but for which no motive is specified or known.

Thus the term prosocial defines behavior that benefits another regardless of the reasoning or motivational components behind the act. Prosocial behavior can be viewed as having "positive social consequences" (Bar-Tal, 1976, p. 4). As Gelfand & Hartmann (1980) illustrate, those investigators of "prosocial" rather than "altruistic" behavior utilize operational definitions "in which concepts are defined in terms of the procedures used to measure or observe them" (p. 217). For example, helping behavior may be defined as assisting an experimenter pick up spilled objects; generosity defined as how much money a child donates out of his/her winnings to a "needy" child. In this respect the nature of altruism and the motivation of the child can be circumvented and the conditions which must exist to produce learning of prosocial acts can be studied.

The term prosocial behavior envelops a wide range of behaviors such as helping, sharing, comforting, and praising. This study will focus on observations of sharing

behaviors in preschool children as a function of play materials. Sharing is defined in various ways depending upon the researcher, but there is general consensus that to share is to grant to another a possession in order that another may use it, at least for a period of time. In the following sections of this introduction, observational studies of prosocial behavior in preschool children are first discussed, followed by a brief review of the experimental literature on external determinants of prosocial responses. A rationale for the focus in the present study on number of play materials is then presented, followed by a discussion of the use of "social" versus "isolate" toys. The introduction concludes with a review of age and gender differences in children's prosocial behavior.

#### PROSOCIAL BEHAVIOR IN PRESCHOOL CHILDREN

Various observational studies of preschool children at play have indicated that instances of prosocial behavior are exhibited, but infrequent. In a study by Murphy (1937) on sympathetic behavior, 70 nursery school children were observed for 216 hours; an average of "considerably less than one sympathetic episode per hour's record of a child" (p. 122) was found. Aggressive behavior was exhibited at approximately eight times the rate of sympathetic behavior. Yarrow & Waxler (1976) observed helping, sharing, and

comforting behaviors in 108 children ranging in age from three-and-one-half to seven years. Each child was observed for 40 minutes. These investigators reported that 87% of the children displayed some form of prosocial behavior. The children exhibited acts of sharing or comforting an average of 2.1 times, and helping acts 6.2 times, during the sampling period.

Beauvais, Worden, & Simovich (1982) observed 116 preschoolers and found infrequent sharing interchanges. They noted that "preschoolers don't readily give up their possessions" (p. 13) and concluded that preschoolers are not generally predisposed to engage in sharing exchanges in the preschool environment. In a descriptive study on helping behavior, Bar-Tal, Raviv, & Goldberg (1982) observed 156 children from 30 to 64 months of age in play situations. The children were separated by age into five groups with each group being observed for 30 minutes. All of the children performed helping acts, though the data indicated a low frequency rate. The ratio of helping acts to total social contacts ranged from 20.27% (for children 30 months of age) to 18.75% (for children 64 months of age).

Tonick, Gelfand, Hartmann, Cromer, & Millsap (1977) observed 27 four- and five-year-old children in a structured situation in which only one toy was provided for groups of three children. They examined the toy exchanges between the

children by comparing prosocial and antagonistic behaviors. Tonick et al. (1977) reported that the children were more likely to fight over the toy than to share or play with it.

#### EXTERNAL DETERMINANTS OF PROSOCIAL BEHAVIOR

Because prosocial behaviors are infrequently observed in young children, researchers have attempted to identify those variables in the environment which will foster the occurrence of prosocial behavior in children. For example, experimental studies have demonstrated that operant techniques such as reinforcement and modeling can be used to teach and promote prosocial behavior. Rushton (1982), in a review chapter on prosocial behavior, cited findings of various studies that assessed the effects of modeling upon donating behavior in children. These studies have found that children's donations of their game winnings to a "needy" child increase after observing a model who donates his/her game winnings. Rushton (1982) also noted that modeling combined with the preaching of generosity increases donation rates in children. In one study cited by Rushton (1982), a model's generous behavior produced an immediate effect of increasing children's donations whereas the preaching of generosity did not. However, preaching did have a significant effect on donating on a two-month retest. In reviewing a study which investigated the effect of the

amount a model donates, Rushton (1982) reported that the more a model donated, the more the children would donate.

In discussing the effects of reinforcement on prosocial behavior, Rushton (1982) reported that verbal praise or rebukes used as reinforcers affected donation rates in children; praise for donating increased donation rates while rebukes resulted in decreased donation rates. Gelfand & Hartmann (1980) have also reviewed studies examining the external determinants of prosocial behavior and conclude that adult praise is a powerful reinforcer for children's generosity.

Rogers-Warren, Warren, & Baer (1977) found that the combined use of modeling, self-report of sharing, and reinforcement for true reports of sharing increased the observed frequency of sharing behavior in eight four-year-olds, whereas modeling combined with reinforcement of the model's reports of sharing did not increase sharing. These researchers concluded that the modeling combined with reinforcement of the model's reports of sharing was not effective in producing increased rates of sharing due to the fact that the model was sharing with the experimenter at the same time as the children were interacting with each other. Thus, the children's attention was divided between their play activities and that of the experimenter and model.

In a study by Barton & Ascione (1979), instructions,

modeling, behavioral rehearsal, prompting, and praise were found to aid children in generalizing their sharing behavior to other situations. They trained 32 children to share in one of three ways: verbally (verbal statements indicating sharing of an object from one child to another), physically (nonverbal sharing, as when one child passed or handed materials to another child), or both physically and verbally. A control group received no treatment. Barton & Ascione (1979) hypothesized that if verbal and physical sharing were members of the same functional response class, one would expect reinforcement of verbal sharing to increase the probability of physical sharing and reinforcement of physical sharing to increase the probability of verbal sharing. The generalization of sharing in both directions was tested. It was found that the generalization of sharing was unidirectional; in order for physical sharing to generalize to other settings, verbal sharing must first be learned.

#### RATIONALE FOR PRESENT STUDY

Although several factors have been identified as promoting sharing, there is one external factor which has not been empirically examined in relation to the observed frequency of sharing behavior: the number of available play materials. However, there are indications in other areas of



child development that availability of materials may be an important factor. For example, Brooks & Lewis (1974), in reference to the lack of consistent findings in the literature on attachment behavior, noted six ecological dimensions that need to be systematically examined to ascertain their influence upon the outcome of attachment studies. The number and type of toys was mentioned as one of these ecological dimensions.

At least one study has examined the number of toys and the effects upon children's behavior. Vliestra (1978) investigated the interaction effects of adult-directed activity, number of toys, and gender of child on social and exploratory behavior in 73 preschool children. The children were divided into either an adult-directed (an adult selects the activities a child engages in) or a child-directed (activities are chosen by the children themselves) experimental condition. In each of these experimental conditions, the children were assigned to either a one-toy or five-toy condition. Vliestra (1978) found that the number of toys influenced the children's social and exploratory behavior. Children in the adult-directed condition engaged in more social interaction than did children in the child-directed condition, and more social interaction was noted for children in the one-toy condition than for the five-toy condition. Unfortunately, the data

did not indicate the type of social interaction the children engaged in, so it is not known whether the number of toys influenced the children's behavior in a prosocial or antagonistic direction.

Several studies have made reference to the number of play materials which were available to children in experimental settings designed to produce certain behaviors such as sharing. Barton & Ascione (1979) used more play materials than children in each group in an initial training session, although no rationale for this decision was noted. Since these investigators were attempting to increase the frequency of sharing behavior, it may be assumed that they thought this strategy would aid them in their endeavor. Thus, in the training session eight groups of four preschool children were provided with six toys per group. To ascertain whether sharing would generalize to other situations and objects, the children were subsequently observed in an art activity. The authors stated "in order to make the art activity one in which sharing was desirable, the number (of art materials) available in a particular set was always less than the number of children present" (pp. 419-420). In other words, more materials than children were present in the training session, whereas fewer materials than children were used in the generalization setting. The rationale for this difference in the ratio of play materials

to number of children in the training and generalization settings of this study is not clear.

In two experiments by Warren, Rogers-Warren, & Baer (1976), the rates of verbal and nonverbal offers to share and the rates of acceptance of these share offers by two groups of preschool children, three to seven years of age, were manipulated by different reinforcement contingencies. In both experiments, each group of four to five children was provided with one of a possible four sets of materials (plastic nuts and bolts, Lego blocks, magic markers, or crayons), although the authors did not offer a rationale for the number of materials chosen.

In another study by Rogers-Warren, Warren, & Baer (1977) five components of a procedure to increase the frequency of sharing behavior that included modeling, self-reporting, and reinforcement of self-reporting were analyzed. These authors stated that a "generous supply of materials was available thus it was not necessary that the children share" (p. 310). Rogers-Warren et al. (1977) reported that the four subjects increased their rates of sharing after introduction of the component training procedure, but it is not evident to what extent, if any, the ratio of play materials to number of children was important.

Finally, Beauvais et al. (1982) made reference to the consideration that availability of materials is one factor

which may influence the frequency of sharing interchanges in preschool children, but did not pursue this suggestion further.

It is difficult to determine whether the ratio of toys to the number of children in the studies which have been cited resulted in different rates of sharing in preschool children. There is no empirical evidence to substantiate a given researcher's rationale, or lack thereof, for a given ratio of materials to number of children. This study investigated whether the number of available play materials (toys) affected the occurrence of sharing behavior in preschool children.

#### TYPE OF TOY

Quiltich & Risley (1973) have investigated the type of toy which may influence and maximize the amount of cooperative play in children by differentiating between "isolate" and "social" toys. "Isolate" toys are defined as toys that are primarily played with by one child at a time, e.g., cash register, toy phone; "social" toys are defined as toys which are played with by two to four children at a time, e.g., pick-up sticks, games. The authors found that "social" toys dramatically increased the amount of observed cooperative play in seven-year-olds. In the Barton & Ascione (1979) study, preschool children were provided with

"social" toys which the authors reported may have inflated the observed amount of sharing behavior. This study used "isolate" toys in order that the results could be attributed to the number of toys, not the type of toy.

#### AGE AND GENDER DIFFERENCES

Another variable in the study of prosocial behavior has been the age of the child. There is disagreement among researchers as to the importance of age as a predictor of prosocial behavior during the preschool years. Yarrow & Waxler (1976) maintain that the socialization process, rather than age change, is a better predictor of prosocial responses. They reported no significant age differences in the occurrence of comforting, helping, or sharing in the 108 children they observed (age range from 3-1/2 to 7 years). In a review of studies on prosocial behavior, Gelfand & Hartmann (1980) found that there is no significant change in the amount of sharing behavior between the ages of two and five, as the majority of preschoolers exhibit infrequent sharing behavior. Thus, according to these researchers, there is little quantitative difference in prosocial behavior during the preschool years.

According to Underwood & Moore (1982), the majority of studies relating age to the occurrence of prosocial behavior have been conducted on generosity and have consistently

found that age and sharing are significantly related; younger children share less than older children. They further state that the relationship between age and prosocial behavior is more conclusive in the studies utilizing broader age ranges than those examining age ranges that are proximate. Eisenberg-Berg & Hand (1979) observed 35 preschoolers aged 48-63 months and reported "sharing significantly increased with age" (p. 360). Bar-Tal, Raviv, & Goldberg (1982) observed that children between the ages of 43-54 months exhibited less sharing behavior than children younger or older in the groups they observed.

As the evidence presented indicates, there are contradictory findings relating age to prosocial behavior. This study examined whether differences existed in the frequency of sharing behavior between four- and five-year-olds. The research indicates that more evidence is needed to determine whether quantitative differences exist between adjacent ages during the preschool years.

In discussion of gender differences in preschoolers, there is lack of consensus as to whether the gender of the child will predict prosocial behavior. In a review of prosocial behavior, Gelfand & Hartmann (1980) state that few studies have reported gender differences in prosocial behavior. Underwood & Moore (1982), in a review of similar studies, reported that while a number of studies on

generosity have not found significant gender differences, there have been other studies which have reported females as more generous than males. This study examined whether boys and girls exhibited differential behavior as a function of the varying number of toys.

## CHAPTER II

### METHOD

#### SUBJECTS

The subjects were nine boys and nine girls attending the Helen Gordon Child Development Center, a laboratory preschool located on the Portland State University campus. Approximately two-thirds of the preschool population are from University student families and one-third from upper-middle class families. One-half of the children are from single-parent families. Written parental consent to participate in the study was obtained for all children.

The children were assigned by gender and age to six groups of three children; three groups of three girls and three groups of three boys. Assignment to the groups was random within the constraint that the children in each group were no more than two to three months apart in age.

There were two groups of five-year-old girls, two groups of five-year-old boys, one group of four-year-old girls, and one group of four-year-old boys.

#### MATERIALS

The toys used in this study were those used by Tonick



et al. (1977): 1) a toy camera which talks when the string is pulled (Fisher-Price #2839 482); 2) a talking telephone which plays recordings of cartoon characters when a string is pulled (Mattell #5506 8730); 3) a Slinky (James Industry Inc. #100); 4) a xylophone on wheels with a playing stick (Fisher-Price #2839 870); 5) a jack-in-the-box (Mattell #5506 0659); 6) soap bubbles with wand for bubble-blowing (Walt Disney Products #2161); and 7) a camera which contains "moving pictures" of a cartoon (Fisher-Price #2839 460).

A child's folding table (1m x 3/4m) and three chairs were provided for the children to sit at while playing with the toys.

#### EQUIPMENT

All observation sessions were recorded with a Sony video tape recorder (Model VO-2800), a Sony solid-state monitor (Model CVM-950), one Sony video camera (Model 34742) with three-quarter inch tape, and one Sony microphone (Model ECM-150). Two Ianebeam 1000 quart color flood lights (Model 3140) were used to provide extra room illumination. The video equipment was housed in a canvas and wood observation booth (four panels measuring 3-1/2m x 1-1/2m) with two one-way mirrors, located approximately three meters from where the children were sitting. The microphone was placed on the

observation booth.

A stop watch was used for timing the sessions.

#### OBSERVATIONAL SETTING

The videotaping took place in a special playroom adjacent to the children's regular classrooms. All the children were familiar with the room.

For each session, each group of three children was seated at the table in the middle of the room, approximately three meters from the observation booth containing the video recording equipment. The children sat approximately one-fourth meter from each other.

The experimenter was seated approximately two-and-one-half meters behind and to the left of the children. An assistant was inside the observation booth operating the video equipment. No other adults or children were present in the room.

#### DESIGN

The overall design for this study was a three-factor, mixed design with repeated measures on one factor, the number of toys. The between-subjects factors were gender and age. This design required that all children receive all levels of treatment, i.e., the varying number of toys. In other words, each group of three children was observed

playing with one toy, two toys, and three toys, thus making this a complete repeated measures design. Videotape recordings of each of the six groups of children were made at three separate sessions (one per day for each toy condition), resulting in 18 recorded sessions. As seen in Table I, the number of toys for each session plus the kind of toy, were presented to the groups in a counterbalanced order between boys and girls. In order to reduce habituation and boredom effects, no groups saw the same toy(s) twice. The toy to be used for the one-toy condition was different for all groups to ensure that the results could not be attributed to the toy itself.

To ensure that the results were not affected by where a child sat, each child was seated in a different chair for each of the three sessions.

#### PROCEDURE

The experimenter escorted the children from their classroom to the observation room. The children were given a standardized rationale for what they would be doing in the observation room (see Appendix A). After the children were seated at the table, the experimenter told the children that she was going to sit down and finish some work as they played with the toy(s). The experimenter then placed the toy(s) in the middle of the table and took a seat behind and

TABLE I  
TOY ORDER PRESENTATION

Girls	First Session	Second Session	Third Session
I	A	C	B
II	C	B	A
III	B	A	C
Boys			
I	A	B	C
II	C	A	B
III	B	C	A

A=1 toy            B=2 toys            C=3 toys

Girls I

A=jack-in-the-box  
B=xylophone  
  talking camera  
C=talking telephone  
  movie camera  
  soap bubbles

Girls II

A=xylophone  
B=slinky  
  talking telephone  
C=jack-in-the-box  
  movie camera  
  talking camera

Girls III

A=talking camera  
B=talking telephone  
  slinky  
C=xylophone  
  movie camera  
  jack-in-the-box

Boys I

A=movie camera  
B=talking camera  
  jack-in-the-box  
C=talking telephone  
  xylophone  
  slinky

Boys II

A=talking telephone  
B=movie camera  
  xylophone  
c=talking camera  
  jack-in-the-box  
  soap bubbles

Boys III

A=slinky  
B=talking telephone  
  slinky  
C=movie camera  
  xylophone  
  talking camera

to the left of the children. The videotape was started the moment the experimenter placed the toy(s) on the table. Each session lasted ten minutes. At the end of the session, the experimenter escorted the children back to their classroom. This procedure was repeated for each group for each of the three toy conditions.

#### EXPERIMENTER AND OBSERVER

The experimenter was a graduate student and participated as both the experimenter and standard behavior rater in this study. One other behavior rater, a graduate student in nursing, was trained for reliability purposes. The reliability rater participated in approximately six months of training prior to data collection.

Prior to training, a pilot study was conducted to test the procedure for this study and to obtain videotapes of children to be used in the development of the coding system.

After the coding system was developed, the experimenter and reliability rater memorized the system and practiced using the system by rating the pilot videotapes, i.e., those tapes not used in the formal study. Four videotapes from the pilot study were randomly selected for use in establishing reliability (criterion was  $K = .68$ ). Data collection began following the establishment of suitable reliability. After the data were collected, all the

videotapes were then rated.

The reliability rater served to maintain standard reliability throughout the formal study and rated one-third (i.e., six) of the videotapes. This experimenter rated all 18 videotapes after all the data were collected.

#### OBSERVATIONAL CODING SYSTEM

In order to measure the rate of sharing as affected by the varying number of toys, a behavioral coding system was designed. While the coding system included all behaviors which naturally occurred in the setting used for this study, only a portion of the behavioral data, the sharing behaviors (Asked-for-Share, Partial Share, and Spontaneous Share), will be analyzed. The remaining data will be used for additional studies.

The basic structure of the coding system was derived from one developed by Tonick et al. (1977). Tonick and her colleagues studied preschool children who played with only one toy. Her behavioral dimensions and categories aided in clarifying particular behaviors which were observed during preliminary phases of the pilot study.

The behavioral coding system was designed so that the behavioral categories would be mutually exclusive and exhaustive, so that only one behavior could be recorded at a time and that no time could pass without a codable behavior.

The categories were defined in such a way as to minimize ambiguity. In this way there would be minimal occasion for arbitrary judgments which could result in inaccurate data and poor inter-rater reliability. Thus the amount of interpretation needed to record the observed behaviors reliably would be minimized.

For example, in the behavioral categories Play and Not Tracking, Play is a solitary activity involving a child and a toy with no interaction between that child and the other children. In the behavioral category, Not Tracking, the activity can be solitary or it can involve the other children, but it does not involve an activity with the toy(s).

The detailed definitions of the sharing behaviors are:

Asked-for-Share. The possessor of a toy gives the toy to another child without qualification upon being asked verbally or physically (e.g., a nonpossessor makes a physical request for a toy and the possessor gives the toy to the nonpossessor).

Partial Share. A possessor qualifies the act of sharing either verbally or physically. "You have to give it right back." "You can hold the string." "I get to hold onto it while you play with it." The possessor maintains contact with the toy. All three children may be playing with the toy. Only code if the possessor still maintains control over the toy.

Spontaneous Share. Without being asked, one child offers another child a toy. "You can play with this now." "Do you want to play with this?"

The remaining definitions of the child behaviors appear in Appendix B.

## OBSERVATIONAL RECORDINGS

An interval recording method was used to record the children's behaviors from the videotapes. The 10-minute observation periods were divided into five-second intervals. The five-second intervals were designated by an audio beep which was superimposed upon all the videotapes. Behavior(s) for each child was recorded at the end of the five-second interval.

A possible 36 categories of behavior were coded for each child after each five-second interval. At least one behavior was coded for each child every five seconds. This provided a sample of at least 120 behaviors for each 10-minute session. Rarely was it necessary to record more than one behavior per five-second interval. Each child was rated individually. In this way a complete and continuous record was obtained for each child.

The behaviors were recorded directly onto coding sheets specifically designed for this purpose. A copy of the coding sheet is in Appendix C. Two coding sheets were required for each observation session.

The coding sheet was divided into ten horizontal columns running sequentially from left to right. Each column represented 30 seconds. Within each horizontal column were further divisions; each child was designated by a letter, A, B, or C.



The 36 behavioral categories each had a two- or three-letter abbreviation. These letter abbreviations and the corresponding behavioral categories they represented were listed at the top of the coding sheet for reference. The numbers 1 and 0 were used to denote whether a child was a possessor or nonpossessor of a toy, respectively. A 1 or a 0 was recorded after each two- or three-letter abbreviation for each five-second interval.

At the top of each coding sheet, the following identification information was noted: Group number, Gender, Age, Toy Condition, Observer, Date, and Page Number.

Each videotape took 30-40 minutes to rate. After all 18 sessions were rated on the coding sheets, the raw data were keypunched onto computer cards which were used as the basis of the data file for all statistical analyses.

#### RELIABILITY

Reliability was calculated on one-third of the videotapes by comparing the behavior ratings of both observers for each five-second interval for each child. Cohen's Kappa statistic was calculated for each 10-minute session for each child and all observed behaviors. For each group there were three scores, one for each child. These three scores were then averaged to obtain one score for each of the six groups for all observed behaviors. For example,

for the five-year-old girls in the one-toy condition, under the behavior category, Asked-for-Share, the scores were: Child A = 1.00; Child B = .00; and Child C = .00. These three scores could not be averaged so the resulting Kappa statistic is 1.00.

After the average was calculated for each group, the group scores were then averaged for a total reliability score across all groups for each behavior. For example, for the behavior Partial Share, the following scores were: Boys I = 1.00; Boys II = .88; Boys III = .92; Girls I = .90; and Girls II = 1.00. These five scores were averaged, and the final Kappa statistic for this behavior is .94.

Reliability was established and maintained at  $K = .83 - 1.00$  for all behaviors.

## CHAPTER III

### RESULTS

The coding instrument was designed to explore in detail various aspects of group behavior involving three children. However, in this study only the three sharing behaviors, Asked-for-Share, Partial Share, and Spontaneous Share, were analyzed.

Table II shows the means and standard deviations by Toy Condition for all the sharing behaviors. These data are collapsed across age and gender since these variables were found to be unrelated to any of the sharing behaviors.

The statistical design selected for analysis of the data was the Complex Latin Square Design (Bruning & Kintz, 1977). This design provides an appropriate analysis for repeated measurements with an experimental design that is counterbalanced for order of presentation, i.e., it allows for evaluation of the effects of the three levels of treatment (number of toys) when order of toy condition is controlled. This Latin Square design was used to analyze each of the sharing behaviors: Asked-for-Share, Partial Share, and Spontaneous Share. In addition, since Asked-for-Share and Spontaneous Share were found to be highly correlated,  $r(52) = .77$ ,  $p < .01$ , they were consequently

TABLE II

Means and Standard Deviations by Toy Condition for Share Behaviors Per  
10-Minute Session

Behavior	Toy Condition 1		Toy Condition 2		Toy Condition 3	
	M	SD	M	SD	M	SD
Asked-for Share	1.500	1.295	.722	1.179	.111	.323
Partial Share	6.722	10.632	14.056	19.702	.778	1.801
Spontaneous Share	1.222	1.003	1.167	1.689	.000	.000
Overall Share	2.722	1.179	1.889	2.246	.111	.323

combined into an Overall Share category, and the Latin Square analysis was applied to this category as well (see Table III).

These Latin Square analyses showed that the effect of toy condition on the four prosocial behavior categories was statistically nonsignificant. However, as can be seen in Table III, toy condition approached statistical significance in Asked-for-Share ( $F(2,4) = 5.607, p < .10$ ) and Partial Share ( $F(2,4) = 5.792, p < .10$ ). Since the interactions of sex with toy condition and sex with session were statistically nonsignificant in Asked-for-Share, Spontaneous Share, and Overall Share, these sources of variability were pooled and another Latin Square analysis was computed for each of these behaviors. It was assumed that the interaction between toy condition and session was negligible. Only the effect of toy condition on Overall Share was found to be statistically significant ( $F(2,8) = 4.922, p < .05$ ).

To determine where statistically significant differences existed among toy conditions for Overall Share, a post-hoc analysis, the Newman-Keuls' Multiple Range Test, was calculated. This post-hoc analysis revealed that there were no statistically significant differences between the one-toy and the two-toy conditions. Significant differences between the one-toy and three-toy conditions ( $p < .05$ ) and

TABLE III  
 COMPLEX LATIN SQUARE ANALYSIS  
 FOR THE SHARE BEHAVIORS

Source	SS	df	MS	F	p
<u>Asked-for-Share</u>					
Between Groups	27.333	4	6.833	1.464	.360
Sex	8.000	1	8.000	1.714	.261
Toy Condition (1,2,3)	52.333	2	26.167	5.607	.069
Session (A,B,C)	.333	2	.167	.036	.965
Sex x Toy Condition	6.333	2	3.167	.679	.558
Sex x Session	27.000	2	13.500	2.893	.167
Session x Toy Condition	18.667	4	4.667		
<u>Partial Share</u>					
Between Groups	4133.111	4	1033.278	2.505	.198
Sex	1058.000	1	1058.000	2.565	.184
Toy Condition (1,2,3)	4777.444	2	2388.722	5.792	.066
Session (A,B,C)	21.444	2	10.722	.026	.975
Sex x Toy Condition	996.333	2	498.167	1.208	.389
Sex x Session	2422.333	2	1211.167	2.937	.164
Session X Toy Condition	1649.778	4	412.444		
<u>Overall Share</u>					
Between Groups	90.889	4	22.722	.765	.600
Sex	29.389	1	29.389	.989	.376
Toy Condition (1,2,3)	192.111	2	96.056	3.232	.146
Session (A,B,C)	11.111	2	5.556	.187	.836
Sex x Toy Condition	18.111	2	9.056	.305	.753
Sex x Session	19.111	2	9.556	.322	.742
Session x Toy Condition	118.900	4	29.722		
<u>Spontaneous Share</u>					
Between Groups	49.556	4	12.389	.680	.641
Sex	6.722	1	6.722	.369	.576
Toy Condition (1,2,3)	51.444	2	25.722	1.412	.344
Session (A,B,C)	11.444	2	5.722	.314	.747
Sex x Toy Condition	4.111	2	2.056	.113	.896
Sex x Session	10.111	2	5.056	.227	.771
Session x Toy Condition	72.887	4	18.222		

the two-toy and three-toy conditions ( $p < .05$ ) were found. It can be concluded from these data that the three-toy condition affects the occurrence of the combined category of Overall Share by reducing the amount of sharing.

## CHAPTER IV

### DISCUSSION

The purpose of this study was to determine empirically whether the number of toys was related to the occurrence of sharing behavior in preschool children. The results showed that overall sharing was significantly affected by the number of toys given to the children. As the number of toys increased, the occurrence of overall sharing decreased.

As reported earlier, Overall Share was a category combining the behaviors of Asked-for-Share and Spontaneous Share, which were found to be highly correlated. In other words, if a child shared when physically or verbally requested (Asked-for-Share), there was a high probability that this child would share without being asked (Spontaneous Share). While the effect of toy condition on the separate categories of sharing behavior, i.e., Asked-for-Share, Partial Share, and Spontaneous Share, was found to be statistically nonsignificant, the combined category of Overall Share was related to toy condition. However, it should be noted that the effect of toy condition on two of the three sharing categories (i.e., Asked-for-Share and Partial Share) approached significance ( $p < .07$ ). It is this experimenter's opinion that a larger sample would



increase the probability that the number of toys would significantly affect the three forms of sharing behavior.

This study confirms the assumptions of Barton & Ascione (1979), Warren, Rogers-Warren, & Baer (1976) and Rogers-Warren, Warren, & Baer (1977), who speculated that the number of play materials would affect the sharing behavior of young children. In the present study, with the exception of the Partial Share category, the more play materials (toys) available to the children, the less they shared. One obvious explanation for this finding is that when there are as many toys as children, there is no need to share. On the other hand, when there are fewer toys available, sharing behavior is more likely to occur.

Examination of the means in Table II showed a decrease in the behaviors of Asked-for-Share, Overall Share, and Spontaneous Share as the number of toys increased. In contrast was the category Partial Share. The means showed that there was more partial sharing in the two-toy condition than in the one-toy condition. It should be remembered that in Partial Share, the child maintains control of the toy while allowing another child to play with it. In the two-toy condition, two of the three children were possessors of a toy, leaving one child without a toy. It may be speculated that this toy condition created a situation in which the two children possessing toys were more likely to

involve the child without a toy in their play activities. It is possible that a possessor of a toy may partially share with a nonpossessor in an attempt to avert any claims to the toy. In this way the possessor can still maintain control over the toy. Further study would help to clarify this supposition.

Examination of the means in Table II also showed that sharing behavior was relatively infrequent during the ten-minute session for all sharing behaviors except Partial Share. These data add further evidence that sharing is infrequently observed in preschool children (Yarrow & Waxler, 1976; Beauvais et al., 1982; and Tonick et al., 1977).

There were no significant interactions between age or gender and the occurrence of sharing behavior. These results concerning gender provide further evidence that gender is not an important variable in the occurrence of sharing behavior (Gelfand & Hartmann, 1980; Underwood & Moore, 1982). Due to the unavailability of subjects, there were only two groups of four-year-olds versus four groups of five-year-olds. Given the small sample in this study, it was not possible to confirm or deny the factor of age as a variable in sharing. It would be appropriate to utilize a larger sample to examine further the roles age and gender may play in the occurrence of sharing behavior in the

preschool child.

A consideration in this study was the type of toy available to the children. As stated previously, only isolate toys were used in order that the results would be attributed to the number of toys, not the type of toy. A question to be addressed is in what ways might isolate toys lend themselves to prosocial behavior. According to the Wall Street Journal (February 7, 1985), the toys currently most popular with children are toys which can be classified as isolate toys (e.g., Cabbage Patch Doll, G. I. Soldier, and Masters of the Universe). Decreasing the number of such toys might provide one means of promoting sharing behavior in children.

In conclusion, replication of this study using a larger sample would clarify the questions that have been raised. The behavioral coding system enabled the full range and complexity of the children's behaviors to be recorded. While this study examined only the relationship between the number of toys and sharing behaviors, further analyses which included the additional behavioral categories would be appropriate. Additional analysis, such as sequential probability analysis, would identify those behaviors which precede and are antecedent to sharing in the different toy conditions. In any case, the present results would indicate that to facilitate sharing behavior in preschool children,

the optimum situation appears to be one in which there are fewer play materials available than children to play with them.

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## APPENDICES



## APPENDIX A

## SCRIPT

In Children's Classroom:

"I would like the three of you to come to the Rainbow Room with me for a few minutes to play with some toy(s) that I have brought with me. I'm interested in what kinds of toys kids play with and how they play with them. Before we go, there are some rules that you must follow. As the three of you play with the toy(s) you must remain in your chairs while we are in the room. Also, no hitting or shoving is allowed. This is the same rule you follow when you play together in your classroom. We'll come back to this room after playing with the toy(s). Let's go play with the toys!"

In the Rainbow (Observation) Room:

"Now remember I want you to sit at the table in these chairs while you play with the toy(s). While you're playing I am going to sit over here in this chair and finish some work. When I'm finished it will be time to go back to your room."

## APPENDIX B

## BEHAVIORAL CODING SYSTEM

1. Acknowledge. Acknowledgment is the P\* of a claim or right to a toy by a NP\*. The P indicates that he/she intends to share, but does not do so immediately. "Just a minute." "I'll give it to you when I am finished.
2. Asked-for-Helping. A NP or P helps a P with the manipulation of a toy when asked to do so; e.g., the P is having trouble closing the lid on the jack-in-the-box and asks another child to help. This category involves the child physically helping the P.
3. Antagonistic Physical. One child physically responds in a hostile manner or interacts with another child in a hostile manner; e.g., one child pushes another child's hand off a toy; another child slaps a child's hand.
4. Antagonistic Verbal. Any hostile verbal exchange between the children. "Don't!" "Stop it!"
5. Command. A P or NP dictates to another child the way in which to play with a toy. The connotation is of bossing. "Do it this way." "Play with it like this."
6. Complain. The child complains to the experimenter about the way a toy is being monopolized or the child expresses unhappiness with the toy itself.
7. Cooperative Play. There is interaction between the children which involves cooperation and participation with the toys or any activity related to playing with the toys, e.g., "If you all get together, I'll take a picture." Or the children are swatting at the soap bubbles that a child is blowing. The other children do not have possession of a P's toy.

\* P = Possessor

NP = Nonpossessor

8. Discontent. A P or NP expresses dissatisfaction over the manner in which another child plays with a toy. "You're making too much noise."
9. Disruptive Behavior. A NP or P physically interferes with the play activities of another child. For example, a child pulls the tape out of the movie camera; a child holds onto the string attached to the xylophone while another child is trying to play with it.
10. Entertaining. A P describes the particular toy activity he/she is engaged in and jokes, clowns, or laughs while continuing to play with the toy. This category does not invite participation from the other children, other than their attention. "Look at what I'm doing." "This camera says funny things." "Watch him come out when the song is over."
11. Experimenter Intervention. This category is coded when the experimenter makes any comment to the children or when the children interact in some way with the experimenter. For example, a child asks the experimenter a question regarding a toy.
12. Ignore Request. A P ignores a verbal or physical request from a NP to share a toy.
13. Ignore Trade Offer. A P ignores a trade offer from another P.
14. Negative Affect. Frowning, sighing, as when a NP expresses nonverbal dissatisfaction with not having a toy to play with.
15. Not Tracking. A NP or P is not paying attention to the other children or to the toy(s). Also code when two children are interacting with each other, not playing with the toys and no attention is being given to the third child.
16. Physical request. Any physical attempts by the NP or P to take a toy from a P or to physically convey the desire for the toy. This category includes physical motions directed towards obtaining the toy. Any attempts to gain the toy by force. For example, holding out hands, tapping or touching the toy, or reaching for the toy.

17. Play. Each child is playing with his/her own toy and does not interact with the other children.
18. Partial Share. A P qualifies the act of sharing either verbally or physically. "You have to give it right back." "You can hold the string." "I get to hold onto it while you play with it." The P maintains contact with the toy while allowing another child to play with it. All three children may be playing with the toy. Only code if the P still maintains control over the toy.
19. Positive Affect. Laughing, smiling, or any exhibition of pleasure. If watching and positive affect occur at the same time, code positive affect.
20. Refusal. A P verbally or physically refuses to give the toy to a NP. "You can't have it." "Not right now." "No, I'm not done." The P pulls the toy away from a NP making a physical request.
21. Rule Stating. A P or NP specifies the order in which a toy is to be shared. "I get it first, then you get it after J.D." "You get one more turn and then it's my turn." "We'll keep it going around in a circle."
22. Asked-for-Share. The P of a toy gives the toy to another child without qualification upon being asked verbally or physically (e.g., a NP makes a physical request for a toy and the P gives the toy to the NP).
23. Share Acceptance. A NP accepts a toy from a P.
24. Share Refusal. A NP refuses a toy that a P is willing to share.
25. Spontaneous Help. A NP or P volunteers to help a P who may be having problems with the manipulation of a toy. "I'll hold it for you."
26. Spontaneous Share. Without being asked, one child offers another child a toy. "You can play with this now." "Do you want to play with this?"
27. Teaching. The NP or P assists a P in his/her play activities by using verbal advice with some technical aspect of the toy. The advice is in the P's interest and does not include bossing. "You have to push the button down." "You'll have to pull the string in order for it to work."

28. Trade Acceptance. One P agrees to trade his/her toy with another P.
29. Trade Offer. One P offers to trade his/her toy with another P. "Can I play with your toy and you can play with mine?" "Will you trade toys with me?"
30. Trade Refusal. One P refuses to trade his/her toy with another P when asked to do so. "No, I like this toy."
31. Verbal Complaint. A NP expresses dissatisfaction with the P for monopolizing the toy. "It's my turn." "You're taking too long." "I haven't had a turn yet."
32. Verbal Demand. A NP tells or directly instructs a P to give him/her the toy. "Give me the toy." "Let me have the toy." "I want to play with it now."
33. Verbal Request. A NP makes a nonthreatening, nondemanding direct request for the toy. The NP asks the P to share the toy. "Can I have the toy?" "Can I have a turn now?"
34. Verbal Request for Information. A NP asks the P when he/she is planning to share a toy. "When am I going to get a turn?" "How much longer are you going to play with it?" "How many turns are you going to have?"
35. Verbal Threat. A NP makes a threatening statement directed toward the P in an attempt to obtain the toy or to shorten the amount of time that a P keeps a toy. A threat may be a literal statement, e.g., "If you don't share with me, I won't share with you." Or the threat may be implied, e.g., "You better share with me."
36. Watching. A NP or P watches either one or both children play with their toys. If the child is a P, he/she is attending to the other children and not to his/her toy.

## APPENDIX C

## CODING SHEET

Group \_\_\_\_\_ Gender \_\_\_\_\_ Age \_\_\_\_\_ Toy Condition \_\_\_\_\_ Observer \_\_\_\_\_ Date \_\_\_\_\_ Page \_\_\_\_\_

AC Acknowledge	EN Entertaining	PA Pos Affect	TA Trade Accept
AH Asked Helping	EI Experimenter Intrvsn	RE Refusal	TO Trade Offer
AP Antag Physical	IR Ignore Request	RS Rule Stating	TRE Trade Refuse
AV Antag Verbal	ITO Ignore Tr Offer	AS Asked Share	VC Verb Complaint
CM Command	NA Negative Affect	SA Share Accept	VD Verb Demand
CO Complain	NT Not Tracking	SR Share Refuse	VR Verb Request
CP Coop Play	PR Physical Request	SH Spontaneous Help	VRI Verb Re Info
DC Discontent	PL Play	SS Spontaneous Share	VT Verb Threat
DB Dis Behavior	PS Partial Share	TC Teaching	WA Watching

1	A						
	B						
	C						
2	A						
	B						
	C						
3	A						
	B						
	C						
4	A						
	B						
	C						
5	A						
	B						
	C						
6	A						
	B						
	C						
7	A						
	B						
	C						
8	A						
	B						
	C						
9	A						
	B						
	C						
10	A						
	B						
	C						