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The Effects of Prosocial and Aggressive Videogames on Children's Donating and Helping

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THE EFFECTS OF PROSOCIAL AND AGGRESSIVE VIDEOGAMES ON CHILDREN'S DONATING AND HELPING

by

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ABSTRACT

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The purpose of this research was to investigate the effects of prosocial videogames, played both singly and cooperatively, and aggressive videogames, played both singly and competitively, on children's prosocial behavior. Eighty boys and 80 girls, half third and fourth graders, and half seventh and eighth graders, were randomly assigned to one of five conditions. In a control condition, children answered questions about videogame experience and enjoyment. In two of the treatment conditions, children played a videogame with prosocial content (a human-like fantasy character rescuing another from danger); half of the children played this game singly, while the other half played cooperatively. In the other two conditions, children played an aggressive videogame (stylized boxing), with half of the children playing singly and the other half competing. Following exposure to one of these conditions, each child's game score, game enjoyment rating, level of

donating, and level of helping were measured.

The results of a three-way analysis of variance (sex x grade x treatment) on donating yielded significant effects for age, $F(1, 140) = 34.12$, $p < .001$, and treatment (with cells collapsed across the multiple-versus solo-play dimension), $F(2, 148) = 4.60$, $p = .011$. Neuman-Keuls multiple comparisons between treatment conditions indicated that children who played the aggressive videogame donated significantly less ($M = 5.56$) than did children in the control condition ($M = 8.97$) or children who played the prosocial videogame ($M = 8.25$). The analysis of variance for helping yielded no significant effects. Neither game scores nor game ratings were significantly correlated with either helping or donating.

Although prosocial videogame play did not increase prosocial responding, aggressive videogame play clearly suppressed this behavior. The failure of the prosocial condition to accelerate donating and helping might be due to the relatively brief exposure used in this study (10 minutes) and/or to the particular prosocial videogame utilized. The failure of the cooperative and competitive game modes to affect prosocial behavior may have been due to the age of the children or to the possibly aversive effects of the type of cooperation required.

(105 pages)

CHAPTER I

INTRODUCTION

Human beings behave within a social context. In this context, a great many behaviors are directed either towards other human beings or are directed in concert with other human beings toward a common objective. These classes of behavior may be considered to be social behavior (Skinner, 1953). An area of concern for behavioral scientists (and policy makers) is understanding and promoting those classes of behavior that are judged to improve the quality of human social interactions. Some positive social behaviors have been described as prosocial and/or altruistic behaviors in the behavioral science literature, with the definitional criterion that all of these altruistic/prosocial behaviors involve one human being acting in such a way as to benefit another (Eisenberg, 1982). In research on prosocial behavior, classes of behavior typically included have been helping, bystander intervention in emergency situations, and types of generosity, such as sharing and donating (Underwood & Moore,1982). Hereafter, the term prosocial behavior will be used to refer to these classes of positive social behaviors.

Since the mid-1960s, there has been an increasing

amount of research on the acquisition, maintenance and modification of prosocial behavior in humans (Eisenberg, 1982). In general, this research has indicated that prosocial behavior can be modified through a variety of antecedent and consequent conditions. These conditions include modeling, behavioral rehearsal, reinforcement, and punishment (Rushton, 1982). With our increasing knowledge of variables that can increase or decrease prosocial responding, it seems important to examine how such conditions are applied to prosocial behavior in our culture, particularly in our educational and entertainment technologies. Utilizing the latter as an example, several research studies have demonstrated that television programs modeling prosocial responding can increase this type of behavior in children. Similarly, research indicates that modeling of non-prosocial behaviors (e.g., aggression, competition, and selfishness) may decrease children's prosocial behavior (Harris & Samerotte, 1975).

A technological development that exhibits potential for modifying children's prosocial behavior is videogames. Videogames are defined as electronic devices in which microprocessors allow a person to play a game that is displayed on a television monitor screen. Videogames have, until recently, consisted of two major forms, the coin operated arcade game and the home programmable videogame (Katz, 1985). They have enjoyed a remarkable popularity with it being estimated that as many as 80 million

Americans had played some form of videogame by the end of 1982 (Katz, 1983). There has been a recent sharp decrease both in home and arcade videogame sales and play, with a concommitant increse in the sale of home computers and home computer games (Katz, 1985). As home computer games involve the same general features and play mechanic of games played on videogame machines the term videogame will be used henceforth to refer both to videogames and computer games. Videogames are currently being used as entertainment devices and, especially in the case of computer games, as a medium for presenting educational content (Cacha, 1983).

Like commercial television, videogames often portray characters emitting social behavior towards each other. It has been suggested that children may subsequently imitate the sorts of behaviors they have observed while playing videogames (Koop, 1982; Cacha, 1983). Given the findings of research on the effects of television on children's behavior, this seems likely.

There are, however, a number of processes impinging on the child playing a videogame, other than modeling alone. First, when playing a videogame, children are, in essence, role playing the actions of one of the game's characters, thereby rehearsing the types of social behavior required for successful completion of the game's objective. For example, in a game requiring the player to be one of the characters in a gunfight between cowboys, the player is

symbolically rehearsing shooting a representation of a human being. Second, in videogames where social behavior is portrayed, the player is differentially consequated for emitting certain kinds of social behavior. These consequences are related to whether or not the player successfully accomplishes the game's objective (which is likely to be a reinforcing event). Therefore, it is probably correct to say that in most videogames involving social themes, certain classes of symbolic social behavior are reinforced while others are punished. Differential reinforcement and punishment have been demonstrated to powerfully affect rates of prosocial behavior in children (Rushton, 1982). Third, many videogames allow two or more players to play concurrently. In most cases the two players are competing, but in a few cases, the players work cooperatively towards a common goal. It has been demonstrated that playing cooperative or competitive games can have accelerating or decelerating effects, respectively, on subsequent measures of children's prosocial behavior (Barnett & Bryan,1974; Orlick, 1981). Fourth, when children play videogames, all of the above factors are in operation simultaneously. It has been demonstrated that manipulations combining modeling, behavior rehearsal, and reinforcement more strongly affect prosocial behavior than any single manipulation (Barton, 1981; Friedrich & Stein,1975). These four arguments suggest that videogames could be potentially more powerful

in modifying prosocial behavior than non-participatory forms of television.

Given this potential power, concern has been expressed recently in both the popular and research literature since the majority of videogames produced thus far tends to involve situations where the player solves problems through aggressive behavior (Cacha, 1983). Further, when two or more players play concurrently, they are typically competing against each other (Favaro, 1982). Because of these two factors, it has been suggested that videogame play may lead to decreases in children's cooperation and prosocial behavior with concomitant increases in aggression and competition (Koop, 1982; Cacha, 1983). Given the effects of modeling, role playing, and reinforcement and punishment on prosocial behavior, such concerns may be realistic. However, some videogames do involve prosocial themes, and a few of these can be played cooperatively. Given what we know about the effects of prosocial modeling, prosocial rehearsal, and playing cooperative games using other media, it is just as likely that prosocial/ cooperative games can increase prosocial behavior in children as it is that aggressive/competitive games can decrease it.

Research investigating the effects of either prosocial or aggressive videogames on children's prosocial behavior is sparse. The potential social importance of this research is great as, although the commercial market for

videogames has changed drastically within the last year, it still seems safe to assume that many children are playing videogames, either on home or arcade videogame machines, or on home computers. As evidence of this, it has been estimated that up to 15% of American households owned home computers by the end of 1984.

The purposes of this dissertation were as follows. First, a review of the literature was conducted to document the kinds of stimulus events that can accelerate or decelerate prosocial responding in children. This review revealed that the effects of manipulations of prosocial behavior may be influenced by the age of the children studied, their gender, their success at the experimental task, and whether or not the activities in which they were involved were pleasant and/or resulted in success experiences for them. These factors are discussed in the literature review section. The second purpose was to illustrate how events that may influence children's rates of prosocial behavior are incorporated into videogame technology and how those events might affect the behavior of children playing various types of videogames. The third purpose was to investigate the effects of prosocial and aggressive videogames on two classes of prosocial behavior in children.

Defining Prosocial Behavior.

Before reviewing the data that suggest that videogames

incorporating different types and arrangements of social behavior may differentially affect prosocial behavior, it will be useful to operationalize what is meant by prosocial behavior. The common element of most definitions has been that prosocial behavior (also referred to as altruism) is behavior that primarily results in a benefit for another person. In most definitions, the presence of prosocial behavior is ruled out if the person behaving benefits from his or her actions (Eisenberg, 1982). In a recent review of the area, Underwood and Moore (1982) point out that the specific behaviors studied under the general definition of prosocial behavior have included helping, bystander intervention, and generosity (sharing and donating). Cooperation has usually been excluded as an instance of prosocial behavior on the grounds that since both parties benefit from cooperating, it is not truly altruistic. Therefore, cooperation will not be included herein as a subclass of prosocial behavior to be studied as a dependent variable. However, children's cooperation seems to be related to their rates of donating and helping (Yarrow & Waxler, 1976; Orlick, 1981). Therefore, cooperation will be discussed as a possible independent variable to be utilized in manipulating children's prosocial behavior. Bystander intervention will also be excluded on the grounds that prior research on this type of behavior indicates that it does not correlate well with other measures of prosocial behavior, and is apparently controlled by different factors

(Underwood & Moore, 1982).

For the purposes of this research, then, the classes of prosocial behavior studied will include generosity (donating) and helping.

CHAPTER II

REVIEW OF THE LITERATURE

The following review is divided into five parts. First, events that can accelerate prosocial responding are discussed. Second is a discussion of events that can decelerate prosocial responding. Third is a presentation of the analogies between the types of events found to affect children's prosocial responding and the types of events that take place when children play videogames. Fourth is an examination of the research to date on the effects of videogame play on prosocial behavior in children, including a discussion of a pilot study completed for this research. Fifth is a discussion of factors that should be controlled or monitored in research on modifying children's prosocial behavior, including the effects of age, sex, task success, and the effects on children's moods of the events that occur during an experiment.

Events That Can Accelerate Prosocial Responding

A variety of stimulus events have been demonstrated to increase prosocial responding in children. These events include antecedents such as modeling, rehearsal (sometimes referred to as role-playing) of prosocial behaviors, and

playing cooperative games prior to tests of prosocial responding. Consequences in the form of rewards for prosocial behavior have also been demonstrated to increase this type of responding as have combinations of rewards, rehearsal, and modeling.

Research on modeling prosocial behavior usually involves presenting children with a live, televised, or filmed model emitting prosocial behavior. Following exposure to the model, one or more measures of prosocial behavior are taken. A prototypical study was conducted by Friedrich and Stein (1973). Preschool children from both high and low socio-economic status (SES) families were shown six hours of either aggressive, prosocial, or neutral commercial television programs. Following this exposure, the authors measured the children's prosocial behavior using a measure that combined cooperation, helping, verbalization of feelings, and use of mature social skills. Although the result was not replicated for high SES subjects, low SES children who viewed prosocial television exhibited significantly more prosocial behavior than did children exposed to the other types of programming. It should be noted that Friedrich and Stein used a global measure of prosocial behavior that included a measure of helping, but not of donating.

In terms of donating and helping, other studies have demonstrated that viewing prosocial televised modeling may increase these behaviors as well. Bryan (1975) conducted a

series of experiments in which children were exposed to televised models of donating or selfish behavior. Children who observed a generous model donated more than children who observed a selfish model. Sprafkin, Liebert, and Poulos (1975) had children watch either a commercial television program modeling helping or one of two programs with neutral content. Following this, the children could choose between earning points for themselves or pushing a button to summon the experimenter to help some puppies that were purportedly in distress. Children who observed the prosocial television program helped more than did children in the other groups.

In studies of rehearsal, children practice or role-play a class of prosocial behaviors prior to measurement of the same class, or other classes, of prosocial behaviors. One of the exemplary studies of this type is that by Staub (1971) who exposed kindergarten boys and girls to one of four treatments: (a) control, wherein the children enacted scenes unrelated to prosocial behavior; (b) role-playing, involving role-playing scenes in which one person helps another; (c) induction, requiring the children to verbalize how help could be provided to a child requiring help; or (d) combined, wherein helping strategies were both verbalized and role-played. Each child was exposed twice to the treatment condition to which he or she was assigned. Dependent measures included helping a child in simulated distress, helping an adult pick up paperclips, and donating

candy to other children. Girls in the role-playing condition scored higher on helping a child in distress than did girls in the control group. Boys who role-played donated more candy than did boys in the non-prosocial control group.

Another study employing rehearsal was that of Barton and Ascione (1979). Preschool children participated in eight sessions of rehearsing either verbal sharing (offering to share), physical sharing (actually sharing materials with another child), or both. A control condition was included where no training was given. All treatments resulted in greater physical sharing than did the control condition on measures taken immediately after the treatments. Interestingly, training share offers alone resulted in increases in physical sharing as great as increases resulting from training in physical sharing. Children trained in verbal sharing shared more at a four week follow-up measure of physical sharing than did children trained in physical sharing. This result is particularly important because it demonstrated generalization of training effects to another, albeit probably related, class of behaviors.

Playing cooperative games prior to a measure of prosocial behavior is, in effect, a variant of the above rehearsal procedures. In this type of manipulation, children are trained to cooperate and the subsequent effects on their prosocial behavior are assessed.

Justification for this approach is provided by findings, such as those by Strayer, Wareing, and Rushton (1979), that cooperation in children is positively correlated with both generosity and helpfulness. In the only published study in this area (Orlick, 1981), preschool children played either cooperative games or traditional games (combining children playing competitively and children playing simultaneously without interacting) prior to a test of donating behavior. Children in the cooperative games group donated more than did children in the other group.

In reinforcement studies, children are placed in a setting in which prosocial responding can occur, and such responding is consequated with events such as praise, points, or tokens. Rushton and Teachman (1978) exposed 7- and 8-year-old children to either praise, reprimands, or no-response from an adult when the children donated tokens for "needy children". In a subsequent test of donating with no adult present, children in the positive reinforcement group donated more than did children in the other two groups. This effect was maintained over a 2-week follow-up period.

Given that single manipulations of prosocial responding can have powerful effects, it seems likely that combination treatments could have even more marked effects. Barton (1981) explored this possibility in a study comparing instructions, modeling, behavioral rehearsal, in-session prompting, and praise on the sharing behavior of 3- and 4-year-old children. Using a multiple baseline across

subjects design, the treatment events described above were sequentially introduced. As each new experimental manipulation was implemented, all of the previous manipulations remained in effect. Ongoing measures of sharing behavior revealed that instructions to share had virtually no effect and modeling a slight effect on this behavior. Behavioral rehearsal, prompting and praise each had a moderate effect on sharing. In the final condition with all treatment elements introduced, sharing behavior increased up to 65% over baseline levels, after a total of thirty training sessions.

Friedrich and Stein (1975) also demonstrated that a combination of commercial prosocial television programming and behavioral rehearsal could have more powerful effects on prosocial responding than prosocial television alone. They exposed kindergarten children to a neutral or to a prosocial television program alone, or to prosocial television in combination with either verbal labeling training, role playing of prosocial behaviors, or both. The television programs were shown over four consecutive 20-minute sessions with labeling and/or role playing following each viewing session. One of the prosocial behaviors measured was helping another child. For the boys in this sample, prosocial television plus role-playing resulted in the greatest frequencies and durations of helping responses.

Events That Decelerate Prosocial Responding

Although this area has been somewhat neglected, there are data indicating that children's prosocial behavior may be decreased by modeled non-prosocial behavior, engaging in competitive behavior, and punishment of prosocial behavior.

Harris and Samerotte (1975) studied the effects of aggressive modeling on helping in adults by having a confederate of the experimenter ask subjects to complete a survey. Prior to this, each subject was either exposed to no model, or to an adult modeling either an aggressive or a helpful response to the request to complete the survey. Fewer subjects in the aggressive-model group agreed to complete the survey than did subjects in the other two groups. Aggressive modeling may affect children's prosocial behavior similarly. In studying the differential effects of modeled generosity and selfishness, Ascione and Sanok (1982) found that children who viewed a televised peer model modeling selfishness donated less than did children who viewed a model who donated.

In studying the effects of competition on prosocial behavior, Barnett and Bryan (1974) had second- and fifth-grade children play a bowling game either competitively with another child or non-competitively. In the non-competitive groups, children received no feedback as to their success on the game. In the competitive groups, three subgroups were formed by random selection with

children in these subgroups being told either that they had won, lost, or tied with the other player on the game they played. In a subsequent test of donating behavior, fifth-graders who competed and were informed that they lost or tied donated significantly less than did children who either played the game non-competitively, or played competitively and were informed that they won. There were no significant differences in donating between the experimental conditions for the second-graders.

Rushton and Teachman (1978) investigated the effects of punishment on donating in their previously described study. They found that children who were reprimanded after donating donated significantly less during a subsequent test than did children who either were praised or who received neutral responding by an adult. The effect was present at a 2-week follow-up, with children who had been punished still exhibiting lower rates of donating.

The Natural Occurrence Of Events That May Accelerate or Decelerate Children's Prosocial Behavior as They Play Videogames

In considering the potential effects of videogame play on children's prosocial responding, it is important to consider three aspects of videogaming: (a) the action that is portrayed on the screen (the display); (b) what action the player must emit to successfully complete the game (player action); and (c) how multiple players interact

(player interaction). For example, in the game Boxing by Activision for the Atari Videocomputer System (VCS), the display consists of two male boxers attempting to hit each other with their fists. The player is required to move his or her boxer on the screen, attempting to hit the other one while avoiding being hit. When Boxing is played as a two player game, the two players compete with each other in attempting to achieve the higher score.

In examining the types of games available for the Atari VCS, the most widely sold videogame system ("Players Guide," 1983), it appears that there are three categories of game display and player action: (a) neutral, where the player's character acts on inanimate objects and the action displayed is not social; (b) aggressive, where the player works to hinder or hurt other characters in the game, with aggressive behavior displayed on the television monitor; or (c) prosocial, where the player attempts to give materials to, help, or rescue another character in the game, with helping, generous, or rescuing behavior being displayed. Player interaction can also be characterized in three ways: (a) solo play, where the game player does not interact with another human; (b) multi-player competitive, where two or more players compete with each other in being the first to achieve the game's objective; or (c) multi-player cooperative, where two or more players achieve the game objective together through joint action.

It is possible to make several analogies between the

elements found in videogames and the events that have been empirically demonstrated to affect children's prosocial responding. The display is analogous to modeling in that specific classes of behavior are depicted on the monitor screen. If the action depicted is prosocial then it can be predicted that the effects on prosocial behavior would be accelerative, as when children view prosocial television programs. If the display depicts aggressive behavior, then a decelerative effect on prosocial behavior could well occur.

The play action of the game is similar to the rehearsal/role-playing procedures that have been used to modify children's prosocial behavior. If the play action requires the child to symbolically share materials with, help, or rescue another game character, then it can be predicted that the child's prosocial behavior might be increased on a subsequent test. If the action required involves symbolically hindering or hurting a character, then subsequent prosocial behavior might be decreased.

Similarly, it should be remembered that reinforcement of prosocial behavior, in contrast to neutral or negative consequences, has been demonstrated to result in greater amounts of this type of behavior in subsequent tests, while punishment decreases subsequent prosocial behavior. In a videogame with prosocial player action, prosocial responding is consequated with presumably positive outcomes such as scoring points or completing the game's objectives.

These outcomes may be reinforcers. Non-prosocial responding results in presumably negative outcomes such as scoring fewer points and/or not completing the game's objectives. This could constitute punishment for non-prosocial behavior. In a game with aggressive player action, prosocial responding is likely to result in negative outcomes such as fewer points scored or failing to achieve the game's objectives. Aggressive behaviors toward the other characters in the game would result in positive outcomes. The first class of events could constitute punishment of prosocial responding, while the second outcome could constitute reinforcement of behavior incompatible with prosocial behavior. Therefore, it seems likely that the reinforcement contingencies in a videogame with prosocial player action could result in increases in subsequent prosocial behavior, whereas an aggressive videogame could produce reinforcement and punishment contingencies that could reduce subsequent prosocial behavior.

Finally, the player interaction in videogames is analogous to some of the cooperative and competitive game manipulations described previously. Orlick's (1981) finding that cooperative gaming results in increased prosocial behavior suggests that when children play videogames cooperatively, their subsequent prosocial behavior may be enhanced. Similarly, the finding that competitive gaming may decrease prosocial behavior suggests

that the same may occur when children play multi-player videogames with competitive player interactions.

Given the above analogies, the following two hypotheses are suggested: (a) playing a videogame with prosocial display and player interaction will result in relatively greater subsequent levels of prosocial responding than playing no videogame; and (b) playing a videogame with aggressive display and player action will result in lower subsequent levels of prosocial responding than playing either a prosocial videogame or no videogame. The findings on the effects of competitive and cooperative games, in combination with the findings that multiple manipulations of prosocial behavior are often more powerful than single manipulations further suggest that: (a) playing a prosocial videogame with cooperative player interaction (prosocial/cooperative-play game) will result in greater levels of prosocial behavior than playing that videogame in a solo-play mode; and (b) playing an aggressive videogame with competitive player interaction (aggressive/competitive-play game) will result in lower levels of prosocial behavior than playing the same game in solo-play mode.

The Effects of Playing Videogames on Children's Prosocial Behavior

In reviewing the literature, only two tests of any of the above hypotheses were discovered. Strein and Kachman

(1983) had three groups of ten 4- and 5-year old children play videogames either competitively or cooperatively with another child, or by themselves. A subsequent measure of their cooperative behavior revealed no statistically significant differences between groups. As the authors noted, however, there were non-significant differences between the group means in the expected direction with the children in the cooperative play group exhibiting more cooperative behavior than children who either played videogames in competition with another child, or who played videogames by themselves. Possibly, the sample size used (10 per group) may have been too small to permit the statistical tests to have adequate power to permit appropriate rejection of the null hypothesis.

A pilot study was conducted for the current research by Chambers and Ascione (1983) in which three groups of six fourth, fifth, and sixth grade boys were pretested on a measure of their donating behavior. They were then exposed to one of three experimental conditions: (a) a control condition wherein they answered questions about videogames; (b) a prosocial/cooperative videogame condition in which pairs of boys played the Atari videogame, Superman; and (c) an aggressive/competitive condition in which pairs of boys played Activision's Boxing game. After exposure to his assigned condition, each boy was retested on donating.

One-way analysis of covariance (ANCOVA) of the posttest scores, using the pretest scores as the covariate,

revealed no significant differences between groups. The small sample size, however, precluded the ANCOVA from detecting significant effects unless they were extremely great (Cohen, 1977). It was therefore decided to calculate the effect sizes of the differences between groups in order to estimate the magnitude of the differences obtained (Cohen, 1977). The formula used for effect size calculation was mean of group A minus mean of group B, divided by the standard deviation of group B (McGaw & White, 1981). This procedure allows one to assess the effects of a treatment on a group of subjects, relative to the effects of a comparison treatment on another group of subjects, in terms of the sample characterisitics of the comparison group. This procedure revealed a substantial difference between the pretest to posttest gain scores of the prosocial/cooperative (PC) and the aggressive/ competitive (AC) videogame groups. The PC mean gain score minus AC mean gain score effect size was -1.06 suggesting that playing the aggressive game depressed subjects' prosocial responding relative to playing the prosocial game.

Taken together, these two studies suggest that both the cooperative-competitive and prosocial-aggressive play dimensions of videogames may affect children's prosocial behavior. It is obvious, however, that further research, using adequate sample sizes, and more explicitly contrasting the effects of cooperation-competition and

prosocial-aggressive elements in game play is needed. Additionally, as the following section will demonstrate, studies of videogame effects need to control more adequately for, or, at the least, to monitor the effects of the factors of age, sex, success at playing the games, and whether or not the children enjoyed playing the game.

The Effects of Age, Sex, Game Success, and Game Enjoyment

Several studies have demonstrated that the age of the subjects and the sex of the subjects have powerful effects on the results of manipulations designed to modify prosocial behavior. This is not surprising since studies of the natural rates of children's helping and donating have demonstrated both age and sex differences in the rates of these behaviors (Underwood & Moore, 1982).

As an example of age effects, Barnett and Bryan (1974) found that younger boys' donating was not decreased by playing competitive games, but that of older boys was. Similarly, Collins and Getz (1976) studied modeling effects on helping and found that the older subjects in their study helped more than did younger subjects.

As an example of the effects of sex, Staub (1971) found that different classes of prosocial behavior were affected differently for boys and girls by a single manipulation. For girls, role playing helping another child resulted in higher rates on a helping measure. For boys, this same treatment did not result in increases in

helping but instead increased donating. Since age and sex can influence the effectiveness of a given experimental manipulation of children's prosocial behavior, it is important to control for these factors in research on videogame effects on prosocial behaviors.

There is also research on the effects on prosocial behavior of events thought to influence children's mood states, such as task success, and non-contingent reinforcement and punishment (Cialdini, Kenrick, & Baumann 1982). Task failure, such as failing on a bowling game, has been found to result in decreased prosocial behavior (Isen, Horn, & Rosenhan, 1973). Others have found that task success can increase children's prosocial behavior. For example, Rushton and Littlefield (1979) found that children exhibited greater rates of prosocial behavior after success on a task than did children who did not have success. Non-contingent, presumably positive experiences, such as being given a dime, can also increase subsequent helpfulness (Isen & Levin, 1972).

Some of the events present in videogame play, such as whether or not a child likes a game, or whether the child does well in playing the game, are similar to the manipulations described above. Therefore, it is possible that success or failure in achieving a videogame's objectives or the degree to which a child reports enjoying a videogame may affect his or her performance on subsequent measures of helping and donating.

As with the effects of age and sex, it would be desirable to control for the effects of game enjoyment and game success. As Campbell and Stanley (1963) point out the possible influence of these factors in experiments on media effects on prosocial behavior permit rival hypotheses to the main hypothesis, that the experimental manipulation caused the observed behavior, to be plausible. One can control for game success by artificially prearranging the feedback a subject will get, as done by Barnett and Bryan (1974). It may, however, be difficult to similarly control for game enjoyment. Also, by the time one has designed an experiment that controls for these factors, or which systematically manipulates them to assess their effects, one could have an experimental design so complex that it could be difficult to implement, and, if implemented, its results could be difficult to interpret. As an alternative, it is desirable to, at the very least, attempt to measure the levels of factors such as game enjoyment and assess what relations they have with the main dependent variables. Correlational techniques could be used for this.

CHAPTER III

STATEMENT OF PROBLEM

As previously indicated, the development of prosocial behavior in children is important. At the same time many children are being exposed to a relatively new entertainment and education medium, videogames, which may have the potential to affect their prosocial behavior. Many of the currently existing videogames have aggressive themes and promote competition among children. From what we know of the effects of aggression and competition, within other media, on children's prosocial behavior, it seems likely that aggressive/competitive videogaming may decrease children's prosocial behavior. Conversely, from what we know of the effects of cooperative play, and modeling, rehearsal, and reinforcement of prosocial behavior on children's subsequent prosocial behavior, it seems likely that prosocial videogames, especially if played cooperatively, could increase children's prosocial behavior. As yet, no adequate research has been performed to investigate these possibilities.

The general purpose of this research was to investigate the effects of playing different types of videogames on children's generosity (donating) and helping.

Previous research has demonstrated that viewing, rehearsing, and being reinforced for prosocial behavior are likely to increase it in subsequent tests. Conversely, viewing, and participating in aggressive behavior prior to a test of prosocial behavior have been demonstrated to result in decreased prosocial responding.

Since these types of manipulations have not been studied adequately within the context of videogaming, an experiment was designed where children were exposed to videogames in which prosocial behavior was modeled, rehearsed, and reinforced, or to videogames where aggressive behavior was modeled, rehearsed, and reinforced. Following this, the effects of these manipulations on children's donating and helping were assessed. Since cooperative games can increase children's prosocial behavior, while competitive games can decrease it, conditions wherein children played prosocial videogames in both a solo-play and a cooperative-play mode were included. Similarly both aggressive/solo-play, and aggressive/ competitive-play conditions were studied. The effects of these treatment conditions were compared with that of a no-treatment control condition in order to demonstrate the effects of the experimental conditions relative to the naturally occurring rates of children's donating and helping. The specific research questions addressed were:

1. Will playing a prosocial videogame prior to measures of donating and helping behavior, result

in higher scores (greater rates of responding) on either of these measures, than playing an aggressive videogame or no videogame?

2. Will playing an aggressive videogame result in lower prosocial behavior scores than in both the no game and prosocial game conditions?
3. Will playing a prosocial game in cooperation with another child result in higher prosocial behavior scores than solo play with the same game?
4. Will playing an aggressive game in competition with another child result in lower prosocial behavior scores than playing the same game in solo-play mode?

Prior research has demonstrated that sex and age of children could have powerful effects on the outcomes of attempts to modify prosocial behavior. For this reason, a factorial group comparison research design, wherein treatment groups were blocked across the two sexes, and two age groups, was used.

Prior research has indicated that factors such as success or failure on a task can result in increases or decreases, respectively, on subsequent measures of prosocial behavior (Cialdini et al., 1982). Similarly, having pleasant experiences can also result in increased prosocial behavior (Rosenhan, Salovey, Karylowsky, & Hargis, 1981). Since factors such as success, failure, and game enjoyment are probably salient mhen children play

videogames, an attempt was made to monitor any effects of these factors. This was done by taking measures of the children's game scores and ratings of the degree to which they enjoyed playing the games. Provision was made in the design for the data analysis to ascertain if children's scores on these measures were correlated with their helping or donating.

CHAPTER IV

METHOD

Subjects

Prior research, using treatments with elements similar to the ones utilized herein, has demonstrated differential effects on prosocial behavior for both sex (Friedrich & Stein, 1973) and age (Barnett & Bryan, 1974). Therefore, subjects for this research were selected from both male and female public school students, across two different age ranges. The procedures used in this research were approved by the Use of Human Subjects in Research Committee of the Institutional Review Board, Utah State University, Logan, Utah.

A total of one hundred and sixty children were recruited from the class lists of children attending Logan (Utah) City Schools during the 1983-84 school year. Half of the sample (80 children) was recruited from the third and fourth grades (elementary) and ages ranged from 8 to 10 years. The other half was drawn from the seventh and eighth grades (junior high) and ages ranged from 12 to 15 years. Half of the children (40) in each of the two grade ranges were boys.

Subjects were recruited as follows. The experimenter

visited all of the third and fourth grade classes (496 students total) at the three largest elementary schools in Logan, Utah, School District. All seventh and eighth grade classes, except for shop and home economics, at Logan Junior High School were also visited (addressing 480 students out of a total population of 585). The experimenter briefly described what subjects in this experiment would be expected to do. The experimenter then passed out a sealed envelope containing: (a) a letter to each student's parents explaining the purposes and procedures of the experiment and asking their permission for their child to be an experimental subject; (b) a parental consent form; and (c) a self-addressed stamped envelope. The students in each class were instructed to take these materials home and give them to their parents. (A copy of the letter and consent form is in Appendix A.) A total of 119 consent forms for elementary students (24% of the students invited to participate) and 87 consent forms for junior high students (18%) were returned.

As each consent form was returned, that student was assigned a subject number. The required numbers of male and female elementary and junior high students were selected from the total available sample, utilizing computer-generated random selection of subject numbers.

Experimental Design

Measurements of each subject's levels on two dependent

variables, donating and helping, were conducted after exposing each subject to either a control condition (C) or one of four treatments. The treatment conditions involved children playing games on an Atari Videocomputer System (VCS) and consisted of a prosocial/solo-play videogame (PS) playing condition, an aggressive/solo-play videogame (AS) playing condition, a prosocial/cooperative-play condition (PC), and an aggressive/competitive-play condition (AC). The game scores for each discrete game round played by each subject, during his or her session of playing an assigned videogame, were recorded. A game round was defined as the period from when a subject began play to when he or she had to press the reset button of the VCS to continue. The ratings, for each subject, of the degree to which he or she enjoyed the game played and the degree to which he or she would like to play that game again, were also recorded.

Subject scores on the donating and helping measures were analyzed according to a factorial design across the five conditions with blocking by age (elementary or junior high grade levels) and sex. According to this design, eight male and eight female elementary students, and eight male and eight female junior high students were randomly assigned to each of the five conditions.

Settings and Apparatus

All research was conducted at the schools from which the subjects were recruited. At each school, two rooms,

across a hall from each other, were used. Each room contained a television monitor, and an Atari Videocomputer System. Two chairs were placed in front of this table. Another table with an 8 x 13 x 10 cm plastic file card box placed on top of it was also in the room. This box, hereafter referred to as the donations box, had a 2.6 cm slit cut in its top and was labeled, "For Logan's Poor Children". On the same table was a standard manual pencil sharpener, a box of 72 unsharpened pencils, and several children's books. The books were selected from a list of books recommended, based on age-appropriateness and high interest level, by third, fourth, seventh, and eighth grade public school teachers. Four chairs were placed in the hall between each room. This area was used as a waiting room for the subjects.

Videogames. Two types of videogame cartridges were used with the two VCS systems. The first game, hereafter referred to as the prosocial game, was Colecovision's Smurfs cartridge. This game has the theme of a human-like creature attempting to rescue another while avoiding various life-threatening dangers. Two Atari joystick controllers were modified so that one controlled forward and backward progression across the screen while the other controlled the up and down motion of the "Smurf" as it moved over and under dangers and obstacles. The two controllers were connected to the same input port of the VCS utilizing a "Y" connector. This enabled two children

to play this game cooperatively. The second videogame was Activision's Boxing, hereafter labeled the aggressive game. This game features two male boxers attempting to strike each other with their fists. It was played by either one player, or by two players competitively. Points were earned by "hitting" the other boxer.

There is no existing scheme for selecting and matching videogames according to difficulty and interest level so the two cartridges were selected based on the following criteria and procedures. The basic criteria for the prosocial game were that the characters shown on the monitor should be human or very human-like beings, that the character representing the player should have as its primary actions helping, sharing materials with, or rescuing another character in the game, that the character representing the player should emit no aggressive behavior, and that the total aggressive content of the game should be as low as possible.

A survey of the commercially available games for the Atari VCS revealed no games where the character's primary actions were helping or sharing, but four games were found in which the character representing the player attempted to rescue another character from a hazardous situation. These games were ET by Atari, Superman by Atari, Firefighter by Imagic, and Smurfs by Coleco. Superman was the game used in the pilot study and all six of the children playing it indicated that they found it frustrating and difficult to

play. For this reason it was rejected. Smurfs was selected as the prosocial videogame for this project on the grounds that, of the three remaining videogames, it met the criteria for prosocial games, specified above, the best. It was of high interest to children in the age ranges to be studied, and it had an appropriate difficulty level for children in those age ranges. In order to validate this choice, a panel of four graduate students in psychology and one special educator rated each of the games in the selection pool on five-point rating scales on: (a) aggressiveness of the game's theme; (b) prosocialness of theme; (c) probable interest level; and (d) probable difficulty level (a copy of the rating instrument is in Appendix B). The judges' ratings were scored by adding together the number of points each judge assigned each game for desirable features (the game's prosocialness and probable interest level) and subtracting from that amount the number of points scored for undesirable features (aggressiveness and inappropriateness of difficulty level). Every judge's total score for each game was added to every other judge's score for that game. The summed scores for each game were divided by five to yield an average score per game that could range from 0 to 10, with 10 indicating the most positive rating. The average score for Smurfs was 8.2, the score for Firefighter was 5.2, and that for ET was 4.6. This indicates that the judges rated Smurfs higher on desirable features, and lower on undesirable features, than

they rated the other videogames. Therefore, selection of Smurfs as the prosocial videogame for this experiment was supported by this procedure.

The criteria for aggressive games were that the character representing the player emit primarily aggressive actions towards other game characters, that the game have little prosocial content, that it should have high interest level, that it should be of an appropriate difficulty level, and that the characters involved should be recognizably human or very human-like. The last criterion was considered especially important because prior research has indicated that abstract representations of person-to-person aggression have less effect on children's behavior than do realistic representations (Noble, 1973). Three commercially available videogames were found that at least partially met these criteria: (a) Boxing by Activision; (b) Gunfighter by Atari; and (c) Warlords by Atari. Gunfighter was rejected since it was not a two-player game. Of the two remaining games, the experimenter chose Boxing as most closely meeting the criteria. Post-hoc validation of this choice was conducted as for the prosocial games except that points were awarded for interest level and aggressiveness, and subtracted for prosocialness, and inappropriateness of difficulty level. The average score for Boxing was 7.7, and for Warlords, 8.0. The judges indicated, however, that the aggression in Boxing was more clearly human against human than that of Warlords.

Therefore, given the small difference in overall scores between Boxing and Warlords (.3 points), Boxing appeared to be the better choice for the aggressive videogame.

Procedures

General procedures. Pairs of subjects were studied concurrently. When each pair of subjects arrived, the experimenter explained what they were expected to do and asked if they were willing to participate. Three junior high girls declined to participate and were replaced. For those subjects agreeing to participate, each member of the pair was taken into one of the two experimental rooms, if in a control, or solo-play condition, or both were taken into one experimental room if they were in a multiple-play condition. They were then given the instructions for the experiment and exposed to one of the five experimental conditions by one of two naive undergraduate research assistants (RAs), paid $1.00 in nickels, and their levels on the two dependent measures were assessed by the RA. One of the RAs was a 23-year-old male and the other was a 24-year-old female. Children generally worked with an RA of the same sex as themselves. In four cases, due to absence or late arrival of one of the RAs it was necessary to have an RA of the opposite sex work with these children (the subjects were one control group elementary boy, two junior high prosocial/cooperative group girls, and one junior high aggressive/solo-play group girl). As this research was run

late in the school year there was little opportunity to run replacement subjects. Using these subjects' data was judged to be less damaging to the study than dropping their data.

Experimental conditions. There were five experimental conditions with equal numbers of subjects of each sex and grade level randomly assigned to each. In the control condition (C) each subject was seated in one of the experimental rooms with the RA. The RA asked each subject a series of questions from an attitudinal questionnaire about videogames. A copy of this questionnaire is in Appendix C. The amount of time that was required for each subject to complete all of the questionnaire items was monitored by the RA, using a stopwatch. The mean time computed over all C subjects was 10 minutes. Subjects in the four experimental conditions were exposed to their respective treatments for this amount of time.

In the PC playing condition, pairs of subjects played the videogame Smurfs with one subject controlling the forward/backward progress of the "Smurf" and one controlling its jumps and ducking over/under obstacles and dangers. The RA demonstrated all of the game's actions before the children began.

In the AC playing condition, pairs of children competed at the videogame Boxing.

In the PS and AS conditions, children played either Smurfs or Boxing, respectively, in the solo-play mode.

Experimental instructions. Prior to the onset of the experimental conditions, each pair of subjects was told the following:

> "We will now have you answer questions about videogames/play a videogame with another child/play a videogame by yourself (depending on the treatment group to which the subject was assigned). We are doing this to see how children react to videogames. After this, you will be paid $1.00 in nickels. You can keep all of your money if you want, or if you want to, you can put as much of it as you would like in one of the two boxes marked, "For Logan's Poor Children". Money put in these boxes will be used to buy food and clothing for poor children. After you have decided whether or not to share your money, you will have to wait for five minutes before going home. We have very nice books and magazines for you to look at. You can see that we also have two boxes of unsharpened pencils and two pencil sharpeners. While you wait here, you can look at the books and magazines or if you want, you can help me by sharpening some pencils for me. I need them for another project. Remember, you can read books or sharpen pencils or both, whichever you want to do is fine with me."

Dependent measures. For game playing subjects, each subject's score for each game round was recorded as soon as that round was completed. Each of the subjects rated the game he or she played for enjoyment (on a 5-point scale) and desire to play that game again (also on a 5-point scale), immediately after their 10 minutes of play had expired. All subjects were asked if they had played videogames either zero, one to ten, or more than ten times prior to this experiment. Following this, two measures of each subject's prosocial behavior were assessed. The behaviors assessed included generosity (donating) and helping. Levels of these behaviors were recorded for each subject on a data sheet, a copy of which is in Appendix D.

Donating was assessed as follows. After exposure to an experimental treatment, each subject was given $1.00 in nickels. The RA then left the subject in the room, with the donations box, for subjects in the control and solo-play conditions. The RA stood outside the door, having instructed the subject to come to the RA when the subject was through. For subjects in the multiple-play conditions, one subject remained in the room the videogame was played in, and the other subject was taken to the other room. There were donation boxes in each room. Prior to leaving the room, the RA reminded the subjects that they could donate by pointing to the donation box and saying "You may either donate some of your nickels now by putting them in that box or you may keep them all; whatever you want to do is fine." The RA then left and waited in the hall between the rooms. For all subjects, the RA took the donation box out of the room each subject was in, after that subject was done donating, and recorded how many nickels were donated (the subjects did not see the donations being counted). Scores could range from 0 to 20 nickels.

Immediately after the donating measure, helping was assessed. To accomplish this, in the control and solo-play conditions the child was seated at the table with the box of 72 pencils, the pencil sharpener, and books. For children in the multiple play conditions, one child remained in the room where the videogame was played and the other child remained in the room to which he or she

had been taken for the donating measure. Before leaving each subject, the RA pointed first to the books then to the pencils and pencil sharpener, saying "Remember, while you wait you may look at these books or sharpen pencils; whatever you want to do is fine." The RA monitored the subjects to ensure that they remained in the areas to which they had been assigned. After five minutes had elapsed each subject was taken to the waiting area. At this time the experimenter explained the true purposes of the experiment and thanked the child for his or her participation. That subject was then transported home. As soon as each subject had moved to the waiting area, the RA went back to that subject's room and recorded the number of pencils sharpened so that at least 10 mm of lead were visible. Scores could range from 0 to 72 pencils sharpened.

Statistical Analysis

Statistical analysis of treatment, sex, and age effects on the dependent measures used a three-way analysis of variance (ANOVA) with grade, sex, and treatment as the factors. Alpha, the probability level at which a statistical test would be accepted as significant, was set at .05 although effects approaching significance ($p. \leq .10$) were reported also. Eta squared (E^2) the proportion of the total variance explained by a given effect was computed for each main effect, interaction, and

the error term by dividing the sum of squares for that effect by the total sum of squares (Glass & Stanley, 1970).

When statistical significance was found across treatments, sex, age, or factor interactions, Neuman-Keuls tests were used to test the significance of all possible pair-wise comparisons of single group means.

To assess the relation between donating and helping, a Pearson product-moment correlation coefficient was calculated between helping and donating scores, across the control, prosocial videogame, and aggressive videogame conditions.

To assess the relations between game scores and donating, and game scores and helping, the following procedures were employed. Mean game scores were computed for each subject by summing his or her scores for each discrete game round played, and dividing by the number of game rounds played by that subject. As Smurfs and Boxing employ different metrics in their scoring systems, separate Pearson product-moment coefficients were computed between Smurf scores and donating, Smurf scores and helping, Boxing scores and donating, and Boxing and helping.

To assess the relations between game ratings and helping, and game ratings and donating, similar steps were taken. Mean game enjoyment rating scores were computed for each subject by adding his or her ratings for game enjoyment and desire to play again, and dividing this sum by two. Correlation coefficients were then computed

between subjects' game enjoyment ratings and donating scores, and between their game enjoyment ratings and helping scores.

Finally, Barnett and Bryan (1974) found that competitive game play only decreased prosocial behavior for subjects, within pairs of subjects, who were informed that they lost or tied in the game that they played. Subjects who were informed that they won donated as much as children who played the same game non-competitively. To assess if losing in a competitive videogame would have a similar effect, a t-test for related measures was performed between the scores of the winning and losing players within the pairs of children in the AC condition. For this analysis, winning was defined as having a higher score than one's partner on greater than 50% of the games played. Losing was defined as having a lower score than one's partner on more than 50% of the games played.

CHAPTER V

RESULTS

One hundred and sixty children participated in this study. Of these, one hundred and thirty-four (84%) indicated that they had previously played videogames more than ten times. Of the rest, all had played a videogame at least once prior to this experiment.

The results obtained from this sample of children are presented as follows:

1. The effects of the primary independent variables, grade, sex, and treatment, on children's donating scores.
2. The effects of grade, sex, and treatment on helping scores.
3. The relation of donating to helping scores.
4. The relation of game scores and ratings to donating and helping.
5. The effects of winning and losing on donating and helping within the aggressive/competitive videogame condition.

Individual scores and group means and standard deviations for donating, helping, game scores, and game ratings are in Appendix E.

Donating: The Effects of Grade, Sex, and Treatment

A total of 130 out of the sample of 160 students (81%) donated at least one nickel. The percentages of students who donated at least one nickel across treatment conditions were 88% for Control (C) subjects, 91% for prosocial/cooperative (PC) subjects, 84% for prosocial/solo-play (PS) subjects, 72% for aggressive/competitive (AC) subjects, and 72% for aggressive/solo-play (AS) subjects.

A three-way analysis of variance (ANOVA--Grade X Sex X Treatment) was performed to test the significance of differences between groups in nickels donated. A summary of this analysis is presented in Table 1.

As the table indicates, there were significant effects for both grade, $F(1, 140) = 35.82$, $p<.001$, and treatment, $F(4, 140) = 3.51$, $p<.01$. The proportion of the total variance accounted for (E^2) was .181 for the grade effect and .071 for the treatment effect. There were no significant sex differences or interactions.

The grade difference was accounted for by the junior high students donating more ($M = 10.19$; $SD = 6.84$) than did the elementary students ($M = 4.45$; $SD = 5.36$).

The means and standard deviations for the experimental conditions are presented in Table 2. The Neuman-Keuls multiple comparison procedure revealed that the treatment difference was due to the children in the prosocial/solo-play (PS) condition donating significantly more than did

Table 1

Summary of Analysis of Variance for Donating (Grade X Sex X Treatment)

Source	SS	df	MS	F	p	E^2
Grade (G.)	1316.76	1	1316.76	35.82	$p<.001$	.181
Sex	26.41	1	26.41	0.72	NS	.004
Treatment (T.)	515.65	4	128.91	3.51	$p<.01$	.071
Grade X Sex	7.66	1	7.66	0.21	NS	.001
Grade X T.	34.15	4	8.54	0.23	NS	.005
Sex X T.	77.75	4	19.44	0.53	NS	.011
Sex X G. X T.	157.75	4	36.76	1.07	NS	.022
Error	5146.62	140	36.76			.706

Note. NS = statistically non-significant; EH2 = eta squared, the proportion of the total variance accounted for by any one effect or interaction.

Table 2

Group Means and Standard Deviations for Donating, Across all Experimental Conditions.

Condition	Mean	*SD*
Control	8.97	6.76
Prosocial/Cooperative-play	6.59	5.25
Aggressive/Competitive-play	5.53	6.53
Prosocial/Solo-play	9.91	7.92
Aggressive/Solo-play	5.59	6.32

children in either the aggressive/competitive-play (AC) group, $p<.05$, or the aggressive/solo-play (AS) group, $p<.05$. Children in the PS condition donated more than children in the control (C) group and both the PS and C conditions resulted in more donations than the prosocial/ cooperative-play (PC) condition. The differences between these latter three groups were not significant.

In examining the means in the initial analysis, it appeared that donating was suppressed in children who played aggressive games, relative to the donating of children in the control and prosocial game conditions. Therefore, the data were regrouped, collapsing the multiple-play and solo-play cells together for both the prosocial and aggressive game groups. A three-way ANOVA was performed on these data (Grade X Sex X Treatment). The results of this analysis are summarized in Table 3. It should be noted that the initial analysis had indicated no significant interaction effects. Therefore, the classical method of ANOVA with unequal groups was employed as recommended by Overall and Spiegel (1969).

As in the original analysis the main effect for grade was significant, $F(1, 148) = 35.66$, $p<.001$, as was that for treatments, $F(2, 148) = 4.60$, $p = .011$. The proportions of variance explained by the grade effect and the treatment effect were .181 and .047, respectively. The Neuman-Keuls multiple comparison procedure revealed that the children who played the aggressive videogame donated significantly

Table 3

Summary of Analysis of Variance for Donating (Grade X Sex X Treatment), With Solo- and Multiple-Play Cells Combined

Source	SS	df	MS	F	p	E^2
Grade (G.)	1316.76	1	1316.76	35.66	$p<.001$	.181
Sex	26.41	1	26.41	0.71	NS	.004
Treatment (T.)	340.02	2	170.01	4.60	$p=.011$	.047
Grade X Sex	7.66	1	7.66	0.21	NS	.001
Grade X T.	7.59	2	3.79	0.10	NS	.001
Sex X T.	64.50	2	32.25	0.87	NS	.009
Sex X G. X T.	54.69	2	27.34	0.74	NS	.008
Residual	5465.13	148	36.93			.750

fewer nickels (M = 5.56; SD = 6.37), p<.05, than did the children in either the control condition (M = 8.97; SD = 6.76), or children who played the prosocial game (M = 8.25; SD = 6.87). There was no significant difference between the control and prosocial conditions.

Helping: The Effects of Grade, Sex, and Treatment

A total of 112 out of the sample of 160 children (70%) sharpened at least one pencil. The percentages of children sharpening at least one pencil across the treatment conditions were 72% for C subjects, 59% for PC subjects, 78% for PS subjects, 63% for AC subjects, and 78% for AS subjects.

A three-way ANOVA (Grade X Sex X Treatment) was conducted on the helping scores. This analysis is summarized in Table 4. There were no statistically significant effects for grade, sex, treatment or interactions. There was, however, a sex by treatment interaction that did approach significance F(4, 140) = 2.09, p<.10). The proportion of variance accounted for by this interaction was .051.

Visual inspection of the means for helping across treatment conditions revealed that the children in the multiple-play conditions helped less than did children in the control and single-play conditions. These means are presented in Table 5. Because of these apparent differences, aggressive and prosocial cells were combined

Table 4

Summary of Analysis of Variance for Helping (Grade X Sex X Treatment)

Source	SS	df	MS	F	p	E^2
Grade (G.)	148.22	1	148.22	1.24	NS	.008
Sex	4.90	1	4.90	0.04	NS	.000
Treatment (T.)	461.79	4	115.45	0.96	NS	.024
Grade X Sex	30.63	1	30.63	0.26	NS	.002
Grade X T.	374.09	4	93.52	0.78	NS	.019
Sex X T.	1003.41	4	250.85	2.09	$p<.10$	.051
Sex X G. X T.	691.06	4	172.77	1.44	NS	.035
Error	16733.00	140	119.81			.861

Table 5

Group Means and Standard Deviations for Helping, Across all Experimental Conditions.

Condition	Mean	*SD*
Control	11.09	11.06
Prosocial/Cooperative-play	8.69	10.28
Aggressive/Competitive-play	8.13	11.57
Prosocial/Solo-play	12.09	10.90
Aggressive/Solo-play	12.13	11.53

and a three-way ANOVA (Grade X Sex X Player Interaction) was used to analyze these data. A summary of the results of this analysis is presented in Table 6. As inspection of the table shows, there were no significant grade, sex, or player interaction effects. The Sex X Player Interaction effect did approach significance, $F(2, 148) = 2.69$, $p = .071$. The proportion of variance accounted for by this interaction was .034. Neuman-Keuls multiple comparisons among the means making up this interaction revealed no differences even approaching significance.

The Relation of Donating to Helping

Pearson product-moment correlation coefficients were calculated between the donating and helping scores within the control, prosocial and aggressive conditions. The correlation between donating and helping for the control condition was +.084. The correlation for the prosocial condition was +.045. The correlation for the aggressive condition was +.235. None of these correlations were significant, although the correlation for the aggressive condition did approach statistical significance, $p < .10$.

The Relation of Scores and Ratings to Donating and Helping

The correlation coefficient between mean game scores and nickels donated, across all subjects playing Smurfs was +.084. The correlation between Smurf scores and helping was +.155. The correlation between Boxing scores and

Table 6

Summary of Analysis of Variance for Helping (Grade X Sex X Player Interaction), With Prosocial and Aggressive Cells Combined

Source	SS	df	MS	F	p	E^2
Grade (G.)	136.90	1	136.90	1.15	NS	.007
Sex	7.23	1	7.23	0.61	NS	.000
Treatment (T.)	436.83	2	218.42	1.83	NS	.022
Grade X Sex	36.10	1	36.10	0.30	NS	.002
Grade X T.	126.58	2	63.29	0.53	NS	.006
Sex X T.	640.88	2	320.44	2.69	p=.071	.034
Sex X G. X T.	489.63	2	244.82	2.05	NS	.025
Residual	17639.81	148	119.19			.904

donating was +.270, $p<.05$. The correlation between Boxing scores and helping was +.010. Over these four correlations, only the Boxing score and donating relation was statistically significant.

The correlation between game ratings and donating was +.026. The correlation between ratings and helping was -.093. Neither of these correlations was significant.

The Effects of Winning or Losing, in the AC Condition, on Donating and Helping

T-tests for related means revealed no significant differences between winning and losing members of pairs of students in the AC condition for donating or helping.

CHAPTER VI

DISCUSSION

The purposes of this chapter are to examine how the obtained results address the questions posed in the problem statement, to discuss the relation of the results to other research and theoretical positions on modifying children's prosocial behavior, and to propose some directions for future research. Each of these topics will be dealt with in a separate section.

Overview of the Results

The first research question posed was whether a prosocial videogame would result in greater levels of donating and helping behavior than no videogame (the control condition) or an aggressive game. None of the experimental conditions resulted in significantly more donating than did the control condition. Children who played Smurfs by themselves did donate slightly more than did control subjects, but this difference was not statistically significant. Children playing Smurfs, especially as a solo-play game, donated significantly more than did children who played Boxing in either the competitive or solo-play mode. For donating, then, the answer to the first research question was partially

affirmative. Prosocial videogame play resulted in more donating than did aggressive videogame play but neither prosocial play condition resulted in more donating than playing no videogame at all.

For helping, the results were negative. None of the experimental conditions resulted in levels of helping that were significantly different from any of the other conditions.

The second question was whether playing aggressive videogames would suppress donating and helping relative to prosocial game play or no game play. The results indicated that this was the case for donating. Children playing an aggressive game donated significantly less than did children in the prosocial game or control conditions. This result did not occur for helping, however.

A third question dealt with whether or not playing the prosocial game cooperatively would result in greater levels of donating and helping than playing the game in the solo-play mode. There were no significant differences between the cooperative play and solo-play conditions for the prosocial game on either the donating or helping measure. Therefore, this result was also negative.

The fourth question was whether or not playing the aggressive game competitively would result in lower levels of donating and helping than playing the aggressive game singly. Neither solo- nor competitive-play of the aggressive game resulted in significantly different levels

of donating or helping.

Age was a significant factor for donating; older subjects donated significantly more than younger subjects but age did not moderate the treatment effect found for donating. For helping, age did not appear to be an important factor.

Gender differences did not substantially affect children's donating. Boys and girls exhibited no statistically significant differences in either their helping or donating behavior.

Game enjoyment was not significantly correlated with donating and helping, in most cases. Game success on Boxing was significantly correlated with donating, but the correlations between Boxing scores and helping, Smurf scores and donating, and Smurf scores and helping were not significant. Donating and helping were not significantly correlated either.

The Relation of the Results to Prior Research

Prior research and theory on prosocial behavior would have predicted the following outcomes for both donating and helping:

> Prosocial/cooperative videogame greater than prosocial/solo-play greater than control condition greater than aggressive/single-play greater than aggressive/competitive-play.

As the prior summary of the results reveals, only

certain elements of the predicted order of differences were obtained. Children who played aggressive games did donate less than children who played prosocial games and children who played no videogames. Current theoretical formulations on the effects of modeled aggression on prosocial behavior state that observing aggression, or participating in it, may inhibit subsequent prosocial behavior (Bandura & Walters, 1963; Staub, 1978). It is puzzling why helping was not affected by aggressive game playing. One possibility lies in the methodology of the present study. Prior experiments in this area have utilized measures of helping such as pressing a button to "help" a peer (Collins & Getz, 1976) or picking up pencils dropped by the experimenter (Ascione & Sanok, 1982). It may be that the helping measure used herein was not as sensitive to the effects of modeled aggression as those other measures. There are some possible reasons for this, although there is no direct evidence to support any of them. First, the act of sharpening pencils may have been reinforcing for some of the subjects. One subject was overheard to remark that it was fun to see how many he could sharpen in the time allotted. If this was the case, then the reinforcement inherent in the task could have overridden the effects of the treatment variables. Second, conversely, it is equally possible that the task of sharpening the pencils could have been punishing for some students. Thirty percent of the subjects sharpened no pencils and all treatment groups,

except one (elementary girls playing the prosocial game), had at least one student who sharpened no pencils. The aversive nature of the task, if it was aversive for some students, could also have suppressed the effects of the independent variables.

The expectation that children who played prosocial games would donate and help more than children in all other groups was also not supported in contrast to previous findings. Again, a methodological difference may be the cause of this. In modeling research, where prosocial behavior has been affected by commercial television programs, extended and/or frequent exposures to the modeling stimulus have often been used. For example, Friedrich and Stein (1973) exposed their subjects to televised modeling for six hours. A large number and/or extended duration of treatments has also been typical in studies utilizing rehearsal or combinations of modeling and rehearsal. In the current investigation, only one treatment session, of 10-minute duration, was used. This may not have been sufficient to produce powerful effects. In some cases, such as in a study by Rushton and Owen (1975) a single short exposure to a model was sufficient to affect donating. It should be noted that in cases such as this one, the modeling films were specially made films that depicted the behavior being measured. The prosocial behavior modeled in Smurfs was rescuing. It may be that modeled rescuing does not affect donating or helping at

all, or that longer exposure to the modeling stimulus would be necessary. It may also be that the prosocial behavior modeled in Smurfs was sufficiently abstract as to not powerfully affect children's behavior. This possibility is derived, by analogy, from Noble's (1973) finding that more abstract depictions of aggression have less powerful effects on children's behavior than do more realistic depictions. It could be argued that Boxing is also abstract, although the characters are clearly human-like.

Another puzzling result was that the competitive- and cooperative-play manipulations did not have behavioral effects in the expected directions. Aggressive videogame playing children who played competitively did not donate less than did the children in the other groups, contradicting Barnett and Bryan's (1974) findings. In that study, however, competition was coupled with outcome feedback from the experimenter, who told each child, whether they won, lost, or tied. Donating was less frequent only for the children in the competitive group who were informed that they had lost or tied. In the current experiment, there were no differences between children who won playing boxing, and children who lost, on either the donating or helping measures. In contrast to Barnett and Bryan's procedure, however, in the current experiment the experimenter reacted neutrally to all children's videogame play. Therefore, it is possible that competition effects prosocial behavior differently depending on the type of

adult feedback. Possibly, non-positive evaluative feedback from an adult is aversive and inhibits prosocial responding.

Cooperative play did not increase levels of prosocial responding over other treatments, as expected. It is possible that the type of cooperation utilized herein suppressed prosocial responding somewhat. It has been proposed, in terms of helping behavior, that having engaged in helping may suppress helping when a person is given another opportunity to be helpful (Staub, 1978). Staub's term for this is "psychological reactance", meaning that the person, while helping, views his or her behavior as being constrained by others so that he or she subsequently acts to reattain freedom by being less helpful. A similar process might have taken place in the current study in that children might have resented having their responses partially determined by their partner. It is also possible that children in the cooperative play condition donated less because of a phenomenon known as diffusion of responsibility (Latané & Darley 1970). In some cases individuals may be less helpful if they know that other people are also expected to help. Children in the prosocial/cooperative-play groups were paired with another child and they were given instructions together. Therefore, each child might have expected his partner to share in donating and helping. However, if diffusion of responsibility depressed donating in the PC condition,

donating would also probably have been suppressed in the AC condition as well. This would have resulted in the children in the AC condition donating less than the children in the AS condition. The data analysis indicates that this did not take place. It should also be noted that even in the solo-play groups, two children were present in the area the experiment took place, albeit working in different locations. Even though solo-play children were not given instructions with another child, presumably they were aware that others were also being asked to donate and help. These arguments make the diffusion of responsibility hypothesis less likely.

One final possible explanation for the lack of effects in the expected direction from prosocial/cooperative play, is the age of the subjects. Orlick (1981) utilized preschool children in his experiment. It is possible that cooperative game play does not affect prosocial behavior in older children.

Game scores and ratings were not positively correlated with donating and helping, except for the correlation between Boxing scores and donating. This result is in direct contradiction to prior findings that task success, and reinforcing experiences in general, result in increased prosocial behavior (Rosenhan et al., 1981). In most of the studies utilizing task success as an independent variable, the children were told by an adult whether or not they had succeeded. Perhaps task success does not impact children's

prosocial behavior in the absence of this type of outcome feedback from another person. This argument seems particularly plausible given the significant relation between Boxing scores and donating. In Smurfs, the scores one earns are meaningful only in relation to each other. Since one competes neither with the computer nor with another player, there is no winning or losing per se. In Boxing, however, one either scores higher than, lower than, or ties with the computer opponent or a human opponent. There is then, direct outcome feedback in the case of Boxing.

Directions for Future Research

In general, the results did support the contention that aggressive videogames have decelerative effects on prosocial behavior. The relatively small proportion of variance explained by playing videogames suggests that aggressive videogames may have a relatively minor effect on prosocial behavior, compared to the effects of other factors which control that behavior. Even so, given the possible undesirable social effects if aggressive videogames do decelerate prosocial behavior, further research would be valuable to ascertain if aggressive videogame play negatively affects prosocial behavior outside the laboratory. It would also be useful to ascertain if these types of games have other undesirable behavior effects, such as increasing aggressive behavior.

There is some evidence that aggression presented on television contributes to juvenile delinquency, at least indirectly (Thornton & Voigt, 1984). In a recent study, Ellis (1983) found that 45.4% of a sample of 404 midwestern sixth-graders played videogames in arcades, where the games are frequently aggressive, one or more times a week. Given the degree of involvement this nation's youth has with aggressive videogames, it would be important to ascertain what the effects of this are.

Parametric studies would also be useful to ascertain which types of aggressive videogames (e.g., games with person-to-person aggression, versus games in which the player aggresses against things associated with persons, such as spaceships) affect children's behavior the most.

There are several questions left unanswered by this study that suggest other possible directions for future research. The first, and probably most salient of these involves the issue of the amount of treatment. It would be useful to determine if longer and/or more frequent exposures to prosocial videogames would result in more powerful prosocial behavior effects. Second, it would be valuable to ascertain whether aggressive videogames would affect helping more powerfully using other measures of helping behavior, such as pressing a "help" button, or picking up dropped pencils. Third, it would be informative to secure a sample of children who are less experienced in playing videogames, if such a sample exists currently, and

ascertain if they react differently than children in the current sample. A fourth possibility would involve studying whether younger children show more prosocial behavior than older children, after playing prosocial videogames cooperatively. Fifth, it would be useful to study the effects of videogames whose screen display and required player actions are more directly related to the types of behavior being studied as a dependent variable. It seems likely that a specially designed computer game involving donating and/or helping might have stronger affects on children's prosocial behavior than the prosocial game used in the current study. Sixth, in the present study, an adult demonstrated the actions in both types of videogames to all videogame playing subjects. It could be argued, therefore, that any treatment effects were at least partially due to the adult modeling prosocial or aggressive behaviors while demonstrating the game. This hypothesis seems somewhat unlikely since, in watching the demonstration, children would observe a character representing the RA behaving aggressively or prosocially towards another character on the screen. This is at least one level of abstraction away from what children would observe playing the game themselves, a character representing them engaging in prosocial or aggressive behavior. If Noble's (1973) contention that the more abstract the model, the less it affects children's behavior is generally true, then watching the demonstration should

have less effect on children's subsequent behavior than actually playing the videogame. In any case, as a final suggestion for research in this area, it would be helpful to attempt to replicate the present results in a study where the game actions are not demonstrated by an adult.

REFERENCES

Ascione, F.R., & Sanok, R.L. (1982). The role of peer and adult models in facilitating and inhibiting children's prosocial behavior. Genetic Psychology Monographs, 106, 239-259.

Bandura, A., & Walters, R.H. (1963). Social learning and personality development. New York: Holt.

Barnett, M.S., & Bryan, L.H. (1974). Effects of competition with outcome feedback on children's helping behavior. Developmental Psychology, 10, 838-842.

Barton, E.J. (1981). Developing sharing: An analysis of modeling and other behavioral techniques. Behavior Modification, 5, 396-398.

Barton, E.J., & Ascione, F.R. (1979). Sharing in preschool children: facilitation, stimulus generalization, response generalization, and maintenance. Journal of Applied Behavior Analysis, 12, 417-430.

Bryan, J.H. (1975). Children's cooperation and helping behaviors. In E.M. Hetherington (Ed.), Review of child development research (Vol. 5) (pp. 127-181). Chicago: University of Chicago Press.

Cacha, F.B. (1983). Glamorizing and legitimizing violence in software: A misuse of the computer. Educational Technology, 23, 7-9.

Campbell, D.T., & Stanley, J.C. (1963). Experimental and quasi-experimental designs in research. Chicago: Rand McNally.

Chambers, J.H., & Ascione, F.R. (1983). [Effects of prosocial and aggressive videogames on children's donating]. Unpublished raw data.

Cialdini, R.B., Kenrick, D., & Baumann, D. (1982). Effects of mood on prosocial behavior in children and adults (pp. 339-359). In N. Eisenberg (Ed.), The development of prosocial behavior. New York: Academic Press.

Cohen, J. (1977). Statistical power analysis for the social sciences. New York: Academic Press.

Collins, W.A., & Getz, S.K. (1976). Children's social responses following modeled reactions to provocation: Prosocial effects of a television drama. Journal of Personality, 44, 488-506.

Eisenberg, N. (1982). The development of prosocial behavior (pp. 1-21). New York: Academic Press.

Ellis, G.J. (1983). Youth in the electronic environment. Youth and Society, 15, 3-12.

Favaro, P. (1982). Games for cooperation and growth: An alternative for designers. Softside, 6, 18-21.

Friedrich, L.K., & Stein, A.H. (1973). Aggressive and prosocial television programs and the natural behavior of preschool children. Monographs of the Society for Research in Child Development, 38(4, Serial No. 151).

Friedrich, L.K., & Stein, A.H. (1975). Prosocial television and young children: The effects of verbal labeling and role playing on learning and behavior. Child Development, 46, 27-38.

Glass, G.V., & Stanley, J.C. (1970). Statistical methods in education and psychology. Englewood Cliffs, NJ: Prentice-Hall.

Harris, M.B., & Samerotte, G. (1975). The effects of aggressive and altruistic modeling on subsequent behavior. The Journal of Social Psychology, 95, 173-182.

Isen, A.M., Horn, N., & Rosenhan, D.L. (1973). Effects of success and failure on children's generosity. Journal of Personality and Social Psychology, 27, 239-247.

Isen, A.M., & Levin, P.F. (1972). Effect of feeling good on helping: Effect of cookies and kindness. Journal of Personality and Social Psychology, 21, 354-358.

Katz, A. (1983, February). The Surgeon General says.... Electronic Games, p. 6.

Katz, A. (1985, January). 1985, the year that shook electronic gaming. Electronic Games, pp. 30-31.

Koop, C.E. (1982, November 9). Family violence: A chronic public health issue. Lecture to the Western Psychiatric Institute, Pittsburgh, PA.

Latané, B., & Darley, J.M. (1970). The unresponsive bystander: Why doesn't he help? New York: Appleton-Century-Crofts.

McGaw, B., & White, K. (1981). Meta-analysis of empirical research. Unpublished training manual.

Noble, G. (1973). Effects of different forms of filmed aggression on children's aggression and constructive play. Journal of Personality and Social Psychology, 26, 54-59.

Orlick, T.D. (1981). Positive socialization via cooperative games. Developmental Psychology, 17, 426-429.

Overall, J.E., & Spiegel, E.K. (1969). Concerning least squares analysis of experimental data. Psychological Bulletin, 72, 311-322.

Players' guide to programmable videogames. (1983, November). Electronic Games Magazine, p. 68.

Rosenhan, D.L., Salovey, P., Karylowski, J., & Hargis, K. (1981). Emotion and altruism. In J.P. Rushton, & R.M. Sorrentino (Eds.), Altruism and helping behavior: Social, personality, and developmental perspectives. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Rushton, J.P. (1982). Social learning theory and the development of prosocial behavior. In N. Eisenberg (Ed.), The development of prosocial behavior (pp. 77-105). New York: Academic Press.

Rushton, J.P., & Littlefield, C. (1979). The effects of age, amount of modeling, and a success experience, on seven- to eleven-year-old children's generosity. Journal of Moral Education, 9, 55-56.

Rushton, J.P., & Owen, D. (1975). Immediate and delayed effects of T.V. modeling and preaching on children's generosity. British Journal of Social and Clinical Psychology, 14, 309-310.

Rushton, J.P., & Teachman, G. (1978). The effects of positive reinforcement, attributions, and punishment on model induced altruism in children. Personality and Social Psychology Bulletin, 4, 322-325.

Skinner, B.F. (1953). Science and Human Behavior. New York: Macmillan.

Sprafkin, J.N., Liebert, R.M., & Poulos, R.W. (1975). Effects of a prosocial televised example on children's helping. Journal of Experimental Child Psychology, 20, 119-126.

Staub, E. (1971). Use of role playing and induction in children's learning of helping or sharing behavior. Child Development, 42, 805-816.

Staub, E. (1978). Positive social behavior and morality, Vol. 1: Social and personality influences. New York: Academic Press.

Strayer, F.F., Wareing, S., & Rushton, J.P. (1979). Social constraints on naturally occurring preschool altruism. Ethology and Sociobiology, 1, 3-11.

Strein, W., & Kachman, W. (1983, August). Effects of computer games on young children's cooperative behavior. Paper presented at the American Psychological Association, Anaheim, CA.

Thornton, W., & Voight, L. (1984). Television and delinquency: A neglected dimension of social control. Youth and Society, 15, 445-568.

Underwood, B., & Moore, B.S. (1982). The generality of altruism in children. In N. Eisenberg (Ed.), The development of prosocial behavior (pp. 25-52). New York: Academic Press.

Yarrow, M.R., & Waxler, C.Z. (1976). Dimensions and correlates of prosocial behavior in young children. Child Development, 47, 118-125.

APPENDICES

Appendix A: Informed Consent Documents for Parents of Potential Subjects

John H. Chambers
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Logan, UT 84322

Dear Parent,

I am a graduate student in the Ph.D. program in Psychology at Utah State University, working under the supervision of Frank Asclone, Ph.D. of the Psychology Department faculty. I am writing to request your permission for your child, _____'s participation as a subject in a research project I will be conducting in the spring of 1984. I am recruiting subjects from some of the third, fourth, seventh, and eighth grade classes within Logan City School District. I am doing this with the district's knowledge and approval.

The research is part of my doctoral dissertation research effort and is designed to assess the effects of playing videogames on children's generosity and helpfulness. The research will be conducted at your child's school, after the school day has ended. Children participating in the study will be required to come in for one 30-minute session.

When your child comes in, I will explain to him or her what he or she will be doing and then ask if he or she agrees to participate. If he or she agrees, he or she will

be exposed to one of the following treatments: (a) filling out a questionnaire assessing children's attitudes towards videogames; (b) playing a videogame that models helping behavior and that has a cooperative style of play (Smurfs by Coleco) for 15 minutes with another child, on an Atari Video Computer System (VCS); (c) playing a videogame which has aggressive content and a competitive play-style (Boxing by Activision) for 15 minutes with another child, on the VCS; (d) playing Smurfs by himself or herself; or (e) playing Boxing by himself or herself. Following treatment, the following experimental tests will be conducted. In order to assess children's generosity, each child will be paid $1.00 for their participation and be given an opportunity to donate part of this money to a fund for needy children. To assess helpfulness, each child will be given the opportunity to choose between reading children's books and helping the experimenter sharpen pencils, while waiting to go home.

As soon as these tests are completed, the true purposes of the study will be explained to each child and he or she will be transported home. All nickels donated will be sent to the Bear River Association of Governments to be utilized to buy clothing and food for needy children. The procedures used in this study have been approved by the Utah State University Institutional Review Board (Committee on Human Subjects in Research).

If you consent to have your child participate in the study described above, please sign the attached parental consent form and return it to me as soon as possible in the enclosed envelope. I will be randomly selecting children to participate in the study from all of the permission slips returned. Therefore, it is possible that if you do consent to your child's participation, that he or she will not be selected to participate. Also, if you consent and your child is selected to participate, you have the right to withdraw your consent and remove your child from participation at any time. After you have returned the consent form to me, I will contact you to inform you if your child was selected to participate and, if so, to make arrangements for him or her to come in for his or her session. You may provide transportation for your child, or, if you prefer, I will do so. Please do not discuss the true purpose of this study with your child as it may bias his or her responses. You may tell your child that I am studying how children feel about videogames.

Thank you for your consideration of this matter. If you have any questions about my research or your child's participation, please feel free to call me at 750-2049 between 10:00 a.m. and 4:00 p.m. on Mondays or Wednesdays, or at my home number, 753-1609 (after 6:00 p.m.).

Sincerely yours,

John H. Chambers

Parental Consent to Child Participation in Research

I, _____, parent of _____, hereby consent to his or her participation in the research project on videogame effects on children's generosity and helpfulness, conducted by John Chambers. I have read the letter, accompanying this consent form, explaining the extent of my child's participation. I agree to the procedures that will be utilized with my child as explained in the letter.

Signature: _____

Date: _____

Please fill in your mailing address and telephone number below so that I may contact you.

Address: _____

_____

Phone: _____

Appendix B: Videogame Rating Instrument

Videogame Rating Instrument

RATER:_____ GAME RATED:_____

I. Aggressiveness of theme: The degree to which the game objective is for the character portrayed by the player to perform actions that will hurt another character and/or hinder that character's efforts to accomplish something.

1	2	3	4	5
almost totally non-aggressive				almost totally aggressive

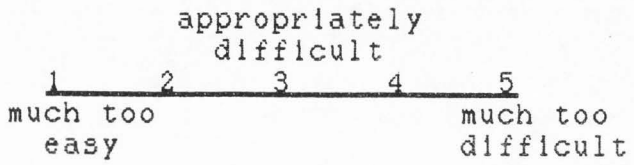
II. Prosocialness of theme: The degree to which the object of the game is for the character portrayed by the player to share his or her materials with another character, help another character to accomplish something, or to rescue another character from danger.

1	2	3	4	5
almost totally non-prosocial				almost totally prosocial

III. Probable interest level for 3rd, 4th, 7th, and 8th grade boys and girls: The degree to which this game is likely to be interesting and fun for the specified children; This includes both immediate interest level and the game's capacity to sustain interest over extended play through such techniques as an increased difficulty level or through giving the player new problems to solve as he or she becomes more proficient at the game.

1	2	3	4	5
very low interest level				very high interest level

IV. Probable difficulty level for 3rd, 4th, 7th, and 8th grade boys and girls: The degree to which the specified children are likely to be able to easily master the skills required for successful completion of the game's objectives without so much ease that the children are likely to be bored with the game.



Appendix C: Questionnaire for Control Subjects

Subject Questionnaire

Name_____ Subject Number_____

1. What grade are you in? _____
2. How many brothers or sisters do you have? __(brothers)
   __(sisters)
3. Do you have any hobbies? ___(yes) ___(no)
   a. What are they? _____
   _____
   _____
   _____
4. What does your dad do? _____
5. Does your mom work? ___(yes) ___(no); Where? _____
6. What are your favorite T.V. programs?
   _____
   _____
   _____
   _____
7. What sorts of things will you do this summer?
   _____
   _____
   _____
8. When you are together with your friends, what sorts of things do you like to do?
   _____
   _____

9. Do you like to read books? ___(yes) ___(no)

   a. What kinds of stories do you like?

   _____

   _____

10. Your age is ____?

11. Have you ever played a videogame? ___(yes) ___(no)

12. How often have you played? ___never, ___1-10 times, ____more than 10 times.

13. Where have you played? ___on a home system, ___on a coin operated arcade game.

14. Do you most often play? ___on a home system, ___on a coin operated arcade game, ___about equally on both

15. What are your three favorite home video games?

   a. None/NA/Don't know

   b. _____

   c. _____

   d. _____

16. What are your three favorite arcade (coin-operated) videogames?

   a. None/NA/Don't know

   b. _____

   c. _____

   d. _____

17. Do you think that videogames are: ___mostly good for children to play, ___mostly bad for children to play, ___equally good and bad?

18. Name three things that might be good about children playing video games.

    a. Don't know

    b. _____

    c. _____

    d. _____

19. Name three things that might be bad about children playing video games.

    a. Don't know

    b. _____

    c. _____

    d. _____

20. Do you own a home videogame computer system?

21. If yes, what games do you own?

    1. _____

    2. _____

    3. _____

    4. _____

    5. _____

22. Do you play any card games? ___(yes) ___(no)

23. If yes, what are your three favorite card games?

    1. _____

    2. _____

    3. _____

24. Do you play any board games? ___(yes) ___(no)

25. If yes, what are your three favorites?

    1. _____

    2. _____

    3. _____

26. Do you play group games (tag, hide-and-go-seek, etc.)?

    ____(yes) ____(no)

27. If yes, what are your favorites?

    1. _____

    2. _____

    3. _____

Appendix D: Data Sheet

Data Sheet

Subject:_____ Number:_____

Treatment:_____ RA:_____

Game:_____ Date:_____

Game Scores: 1____ 2____ 3____ 4____ 5____ 6____

7____ 8____ 9____ 10____

Game Durations: 1____ 2____ 3____ 4____ 5____ 6____

7____ 8____ 9____ 10____

Subject's Rating of Game:

1	2	3	4	5
Didn't Like	Mostly Disliked	Neither Liked Nor Disliked	Mostly Liked	Liked A Lot

Would Want to Play Game Again

1	2	3	4	5
Never	Mostly no	Don't Care	Mostly Yes	Very Much

Number of Nickels Donated:_____

Number of Pencils Sharpened:_____

Appendix E: Individual Scores, Group Means, and Standard Deviations For All Subjects

Table 7

Raw Scores, Means, and Standard Deviations (SD) for Donating Across all Treatments for Elementary School Boys (EB), Elementary Girls (EG), Junior High Boys (JB), and Junior High Girls (JG).

Scores									Mean	SD
Control Condition										
EB	5	0	7	6	2	20	8	20	8.50	7.56
EG	0	0	0	1	8	5	8	1	2.88	3.56
JB	20	20	4	20	9	10	12	7	12.75	6.43
JG	16	15	10	10	20	7	10	6	11.75	4.80
Prosocial/Cooperative										
EB	7	3	5	2	0	10	2	1	3.75	3.37
EG	10	5	2	4	10	0	1	8	5.00	3.96
JB	8	7	20	12	0	10	5	10	9.00	5.78
JG	3	3	10	7	20	15	7	4	8.63	6.12
Aggressive/Competitive										
EB	1	1	0	1	4	0	2	0	1.13	1.36
EG	10	0	10	5	0	0	4	5	4.25	4.17
JB	16	16	20	10	0	1	10	4	9.63	7.44
JG	0	4	2	6	5	0	20	20	7.13	8.24
Prosocial/Solo-play										
EB	0	0	2	10	2	14	20	18	8.25	8.31
EG	0	4	2	5	0	20	5	1	4.63	6.55
JB	20	10	8	18	0	20	7	20	12.88	7.66
JG	20	15	8	10	16	20	2	20	13.88	6.64
Aggressive/Solo-play										
EB	1	15	3	0	9	0	0	2	3.75	5.44
EG	2	0	4	0	0	8	5	0	2.38	3.02
JB	8	12	20	0	4	15	2	0	7.63	7.44
JG	4	10	6	6	20	2	19	2	8.63	7.19

Table 8

Raw Scores, Means, and Standard Deviations (SD) for Helping Across all Treatments for Elementary School Boys (EB), Elementary Girls (EG), Junior High Boys (JB), and Junior High Girls (JG).

Scores									Mean	SD
Control Condition										
EB	15	17	1	2	7	5	0	29	9.50	10.09
EG	12	0	3	19	7	11	0	20	9.00	7.89
JB	0	0	17	0	13	8	33	0	8.88	11.84
JG	21	9	25	0	39	26	0	16	17.00	13.56
Prosocial/Cooperative										
EB	14	23	0	0	0	15	0	0	6.50	9.35
EG	5	12	1	0	8	21	21	10	9.75	8.07
JB	21	7	0	0	1	0	0	0	3.63	7.42
JG	35	4	0	21	13	31	0	15	14.88	13.45
Aggressive/Competitive										
EB	1	28	3	0	9	5	3	20	8.63	10.10
EG	10	2	35	1	19	0	8	0	9.38	12.26
JB	25	12	0	0	0	0	45	0	10.25	16.71
JG	0	2	16	0	0	11	0	5	4.25	6.11
Prosocial/Solo-play										
EB	5	15	14	0	9	10	33	10	12.00	9.74
EG	4	7	4	35	16	10	18	6	12.50	10.50
JB	0	34	0	0	20	31	30	21	17.00	14.86
JG	5	16	12	0	0	0	10	12	6.88	6.45
Aggressive/Solo-play										
EB	34	2	17	12	0	6	0	4	9.38	11.60
EG	1	8	8	23	0	0	10	14	8.00	7.95
JB	30	30	37	30	16	19	0	0	20.25	14.17
JG	2	10	0	23	21	4	20	7	10.88	9.20

Table 9

Raw Scores, Means, and Standard Deviations (SD) for Game Ratings Across all Treatments for Elementary School Boys (EB), Elementary Girls (EG), Junior High Boys (JB), and Junior High Girls (JG).

Scores									Mean	SD
Prosocial/Cooperative										
EB	4	5	4.5	5	5	5	4.5	4	4.63	0.44
EG	5	5	5	5	5	5	5	5	5.00	0.00
JB	4.5	5	4.5	4	5	5	3	4	4.38	0.69
JG	3.5	4.5	4	4	4.5	3.5	4.5	3.5	4.00	0.46
Aggressive/Competitive										
EB	5	5	5	4.5	5	4.5	3.5	4	4.56	0.56
EG	4	4	1	1.5	3	2.5	4.5	3.5	3.00	1.25
JB	4.5	4	4	4	3	2	3.5	3.5	3.56	0.78
JG	2.5	3	2.5	4	4	4.5	4.5	5	3.75	0.96
Prosocial/Solo-play										
EB	5	5	5	4.5	5	5	5	4.5	4.88	0.23
EG	5	5	5	5	5	5	4.5	2.5	4.63	0.88
JB	5	4.5	4	4.5	4	4	4.5	4.5	4.38	0.35
JG	4	3.5	1.5	5	3	2.5	4.5	3	3.38	1.13
Aggressive/Solo-play										
EB	3	4.5	5	2	5	5	5	4	4.19	1.13
EG	3	4.5	4	2.5	4.5	3.5	2.5	3.5	3.50	0.80
JB	4	4.5	3	3	4	3	5	1.5	3.50	1.10
JG	3.5	4.5	4	3	2.5	3	4.5	3.5	3.56	.73

Table 10

Raw Scores, Means, and Standard Deviations (SD) for Game Scores for the Prosocial Game, Across the Cooperative- and Solo-play Conditions, for Elementary School Boys (EB), Elementary Girls (EG), Junior High Boys (JB), and Junior High Girls (JG).

Scores					Mean	SD
Cooperative-play						
EB	3433.33	3433.33	3016.67	3016.67		
	9225	9225	8420	8420	6023.75	3011.54
EG	5116.67	5116.67	6140	6140		
	7220	7220	7075	7075	6387.92	901.11
JB	9150	9150	5200	5200		
	6440	6440	8125	8125	7228.75	1624.14
JG	6860	6860	9633.33	9633.33		
	8450	8450	9400	9400	8585.83	1165.83
Solo-play						
EB	5320	5900	12800	6800		
	6220	4840	6240	5180	6662.50	2562.51
EG	7800	2733.33	2766.67	4560		
	18000	6160	5925	13000	7618.13	5325.46
JB	8220	10133.33	10050	9200		
	5100	21200	9125	4760	9723.54	5083.45
JG	15133.33	9533.33	7700	9233.33		
	6280	4850	16466.67	8950	9768.33	4058.47

Table 11

Raw Scores, Means, and Standard Deviations (SD) for Game Scores for the Aggressive Game, Across the Competitive- and Solo-play Conditions, for Elementary School Boys (EB), Elementary Girls (EG), Junior High Boys (JB), and Junior High Girls (JG).

Scores					Mean	SD
Competitive-play						
EB	36.2	23.4	90.4	63.4		
	50.6	14.4	58.25	72.75	51.18	25.50
EG	63.8	53.4	44.2	29.2		
	52.75	54.5	61.6	51.6	51.38	10.81
JB	86	79.6	91.8	64.6		
	98.2	60.6	97.8	51.2	78.73	17.94
JG	68.8	71.2	26.2	30.2		
	61	60.5	67.75	37.25	52.86	18.53
Solo-play						
EB	26.2	60.2	41.8	38.8		
	50.4	43.2	72	57.2	48.73	14.3
EG	23.25	35.2	20.4	23.4		
	22.2	30	36	26.5	27.12	5.99
JB	64.4	81.2	42.4	60.6		
	57.4	62.6	58.6	41.2	58.55	12.71
JG	83.6	50.6	80.6	60		
	48.2	82.6	72.6	42.2	65.05	16.87

VITA

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Doctor of Philosophy

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Education:

1) Washington State University, Bachelor of Science in Psychology, 1970.

2) University of Idaho, Master of Science in Psychology, 1972.

3) Utah State University, completed requirements for Doctor of Philosophy degree in Psychology (Analysis of Behavior), 1985.

Professional Certification:

Utah State Board of Education, Basic Professional Certificate (School Psychologist), issued 4/1/82.

Professional Employment:

1) 1982 to present - School Psychologist, Cache County School District, Logan, UT - Duties include psychoeducational and behavioral assessment of children, consultation with regular classroom and Special Education teachers, developing Individual Education Programs for handicapped students, supervision of teachers and aides implementing behavior modification programs for students, providing behavioral training (including social skills training) and behavioral counseling with behaviorally handicapped students, and providing counseling to parents of handicapped students.

Employment (cont.):

2) 1980 to 1982 - Research Assistant, Early Childhood Research Institute, Exceptional Child Center, Utah State University, Logan, UT - Duties included assisting in research, assisting in grant preparation, providing inservice training on behavioral programming for the handicapped for preschool program staff, providing psychoeducational/behavioral assessments for handicapped children in preschool programs.

3) 1978 to 1980 - Director, Services for Handicapped Children, Bear River Head Start, Logan, UT - Duties included indvidual assessment and educational program development for Head Start students, providing training for Head Start staff and parents on programming for the handicapped, and providing behavior management training for parents.

4) 1976-1978 - Behavior Specialist, Exceptional Child Center, Utah State University, Logan, UT 84321 - Duties included assessing students in the Education Unit of the Center, developing individual education programs for those children, training individual children, supervising teachers, aides, and USU practicum students in their implementation of training programs with handicapped students, training parents in implementing treatment programs with their children, collecting and evaluating data on the progress of children in the unit, conducting research on the efficacy of treatment programs, and providing inservice training to center staff, USU students, and staff of other agencies.

5) 1972-1976 - Staff Psychologist, Twin Falls Child Development Center, Twin Falls, ID - Duties included assessing children, providing behavior counseling and skill training to children, training parents in behavior management skills, consulting with teachers in local schools on dealing with children's behavior problems, and appearing as an expert witness in Child Protective Services cases.

University Teaching Experience:

1) 1979 - Instructor for Abnormal Psychology - Utah State University, Extension Class Division.

2) 1978 - Teaching assistant for History and Systems of Psychology - Utah State University.

3) 1977 - Teaching Assistant for Human Development - Utah State University.

Workshops and In-Service Training Presentaions:

1) Assessment and Identification of Gifted Students - Lincoln Elementary School, Hyrum, UT, January, 1985.

2) The Special Education Teacher as a Consultant - Cache County School District, Logan, UT, April, 1983.

3) Programming for Handicappped Preschoolers - Wyoming Child Development Centers, Rock Springs, June, 1980.

Research:

1) Chambers,J.H., & Ascione, F.R. (1983). [The effects of playing aggressive/competitive-play and prosocial/cooperative-play videogames on donating in elementary school boys.] Unpublished raw data.

2) Chambers, J.H., Sanok, R.L., & Striefel, S. (1980). Using contingent decreased freedom-of-movement to eliminate classroom running away: A case study. Education and Treatment of Children, 3, 123-132.

3) Crossman, E.K., Williams, J.G., & Chambers, J.H. (1978). Using the PET microcomputer for collecting and analyzing observational data in the classroom. Behavior Research Methods and Instrumentation, 10, 563-566.

Grants:

1) Investigating the effects of three intervention programs for young single parents and their families With Casto, G. & Bell, C. - Utah State University Office of Research - Funded, 1982.

2) Longitudinal effects of day care on children and families - With Casto, G., & Eldred, N. - Department of Health, Education, and Welfare - Approved but not funded, 1980.

3) Expanding services to handicapped children at Bear River Head Start - With Noble, S. - Department of Health, Education, and Welfare - Funded, 1979.

4) A demonstration program to combat burnout in rural mental health professionals - With Casto, G. - Office of Human Development - Funded, 1979.

Professional Affiliations:

1982 to present - Member of Western Psychological Association.