THE EFFECT OF RESPONSE PRECLUSION ON STEREOTYPY
AND PLAY IN A CHILD WITH AUTISM

Veronica Delgado, B.A.

Thesis Prepared for the Degree of
MASTER OF SCIENCE

UNIVERSITY OF NORTH TEXAS
December 2004

APPROVED:
Jesus Rosales-Ruiz, Major Professor
Sigrid S. Glenn, Committee Member
Janet Ellis, Committee Member
Richard G. Smith, Chair of the Department of Behavior Analysis
David Hartman, Dean of the School of Community Service
Sandra L. Terrell, Dean of the Robert B. Toulouse School of Graduate Studies

This study investigates the effectiveness of response preclusion on stereotypic behavior (climbing and licking) and on play for a child with autism. Data were collected on stereotypic responses, play behavior, and the types of play materials the participant contacted. Implementation of response preclusion was followed by both a decrease in stereotypic behavior as well as an increase in play behavior. Play behavior did not return to baseline levels of responding during reversals to baseline, and stereotypic behavior decreased across reversals. These results suggest the current antecedent manipulation not only reduces stereotypic behavior, but also can establish an environment that is more conducive to learning new, desired behavior.
ACKNOWLEDGEMENTS

I wish to express my appreciation to my Dr. Jesus Rosales-Ruiz, my advisor, for the guidance and expertise he provided during this project. I would also like to thank all of my colleagues who assisted with videotaping, data collection, and physical arrangement of the environmental conditions. Without the help of my adviser and my fellow students, this project would not have been possible.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>iv</td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2. METHODS</td>
<td>8</td>
</tr>
<tr>
<td>Participant</td>
<td></td>
</tr>
<tr>
<td>Setting and Materials</td>
<td></td>
</tr>
<tr>
<td>Observation and Measurement</td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td></td>
</tr>
<tr>
<td>3. RESULTS</td>
<td>15</td>
</tr>
<tr>
<td>4. DISCUSSION</td>
<td>20</td>
</tr>
<tr>
<td>REFERENCE LIST</td>
<td>28</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

1. The participant’s stereotypic behavior and adult’s blocking/redirection across conditions .................................................................25
2. The participant’s play behavior across conditions .................................................26
3. The participant’s engagement in functional manipulation of the different play material types across conditions........................................27
CHAPTER 1
INTRODUCTION

Among the characteristics associated with the syndrome of autism are reduced variation with respect to activity selection, deficits in play activities, and behavioral excesses taking the form of stereotypic responding (American Psychiatric Association, 1994). The degree to which the characteristics of autism are manifested varies widely however, and consequently, so do the repertoires of these individuals.

An examination of play behavior of children with autism indicates they tend to have severe deficits in play with toys (Tilton & Ottinger, 1964). Stone, Lemanek, Fishel, Fernandez, and Altemeier (1990) reported that children with autism contacted significantly fewer toys and spent relatively shorter durations contacting toys than did children with other developmental delays, hearing impairment, language impairment, and no developmental delays.

When compared to typically developing children and children with other developmental delays, children with autism tend to engage in higher rates of repetitive manual and oral manipulation of play materials (Tilton & Ottinger, 1964). Common responses observed by these experimenters included patting, shaking, twirling, spinning, and mouthing of toys, and a specific lack of “combinational uses of toys” (Tilton & Ottinger, 1964, p. 970) or functional manipulation was noted as well. Examples of functional manipulation include, vertical/horizontal block combinations, placing toys in the bed of a dump truck, rolling a car, placing a hat on a doll’s head, etc. Similarly, Sigman and Ungerer (1984) found children with autism engaged in fewer instances of functional play when compared with typically developing children and children with other
developmental delays. Because the severe play deficits exhibited by children with autism typically result in their being excluded from peer-involved play activities and the social opportunities associated with peer interaction (Rutter, 1978; Strain & Cooke, 1976; Wolfberg & Schuler, 1993) many studies have focused on training play behavior.

Strategies to promote play behavior have included direct instruction in toy and play behavior to the child with autism (Santarcangelo, Dyer, & Luce, 1987; Tiegerman & Primavera, 1981). Santarcangelo et al. (1987) investigated the effect of two experimental conditions, differential reinforcement and specific toy training, on the play behavior and disruptive behavior of children with autism. In their study, examples of disruptive behavior included object destruction, mouthing objects, banging objects, disrobing, and leaving the room. In the differential reinforcement condition, engaging in play behavior was reinforced at the end of each 30 s interval. During specific toy training, participants were required to complete a 7 to 13 step task analysis specific to a particular toy with prompts delivered when the child had not contacted the toy for 15 consecutive seconds. Whether or not participants’ play behavior was reinforced during this condition was not specified. Results indicated the specific toy training procedure was associated with higher levels of toy play and lower levels of disruptive behavior relative to baseline. During the differential reinforcement condition increases in appropriate play were moderate, and increases in disruptive behavior were noted during this condition as well.

Tiegerman and Primavera (1981) investigated the use of three different interactional strategies to determine their influence on object manipulation by children with autism. In the three strategies, the experimenter 1) imitated the child’s object manipulation with an
identical object; 2) engaged in a different movement with a duplicate object; and 3) engaged in a different action with a different object. Results of the study indicated that the technique in which the experimenter imitated a child’s object manipulation directly increased both the frequency and the duration of the participant’s manipulation of objects including a toy telephone, a toy car, a baby doll, and a rattle. During the procedure the experimenter sat directly across from the participant and imitated each action performed by the child during 17 sessions, each 15 min long. There were no follow-up sessions or reversals included in the study, and the type of object manipulation was not specified.

The use of peers to promote play behavior in children with autism has been explored by researchers such as Wolfberg and Schuler (1993). These researchers employed a multi-component model of promoting play that focused on immersing children in play environments with carefully selected peers and physically arranged environments that increase the likelihood the children will engage in play behavior. Specifically, this model includes features such as: inclusion of typically developing peers considered “socially competent;” play spaces which take into consideration size, organization of play materials, arrangement of objects in the play space, and ease of accessibility; inclusion of a diverse selection of play materials; provision of a predictable routine and environment; providing opportunities for children to select activities; fading out of adult facilitation with increased child competence; and full incorporation (versus teaching play sequences as isolated tasks) of children in play activities with peers.

In other interventions Goldstein and Cisar (1992) trained children with autism and their typically developing peers to engage in specific verbal and non-verbal behavior in the presence of certain play materials, and Goldstein, Kaczmarek, Pennington, and
Shafer (1992) trained peers to attend to, comment on, and acknowledge the play behavior of their peers with autism.

In many studies, the purpose of the research has not only been to study methods to increase the number of play responses in which a child with autism engages but also, to decrease their engagement in self-stimulatory or stereotypic behavior involving play materials (Eason, White, & Newsom, 1982; Greer, Becker, Saxe, & Mirabella, 1985; Koegel, Firestone, Kramme, & Dunlap, 1974; Nuzzolo-Gomez, Leonard, Ortiz, Rivera, & Greer, 2002; Santarcangelo et al. 1987; Wolfberg & Schuler, 1993;). Instances of such stereotyped/self-stimulatory responses include spinning the wheels of a car, truck, or train, setting objects into spinning motion on another surface, patting or tapping objects with fingers or hands, and mouthing objects.

Stereotypy typically is characterized by rhythmic, repetitive responses with no apparent adaptive function, and these responses persist in the absence of obvious social reinforcement (Baumeister & Forehand, 1973). Examples of stereotyped behavior include, but are not limited to, body rocking, hand flapping, complex hand and finger movements, repetitive manipulation of objects, object mouthing, and repetitive vocal behavior (LaGrow & Repp, 1984; Lovaas, Koegel, Simmons, & Long, 1973).

Stereotypy often disrupts activities such as learning (Koegel & Covert, 1972; Lovaas et al., 1973; Morrison & Rosales-Ruiz, 1997; Risley, 1968), social interaction (Koegel, et al., 1974; Rutter, 1978; Strain & Cooke, 1976), and play (Stone, Lemanek, Fishel, Fernandez, & Altemeier, 1990). Because persistent stereotypic repertoires affect many critical areas of an individual's life, these responses are of particular concern to educators and caregivers of persons who engage in stereotypic behavior (McEntee &
Saunders, 1997) as well as to the many behavior analysis researchers who have focused on this issue.

Overall, the interventions designed to reduce stereotypic responding are quite diverse. Included in the category of consequence-based procedures are those incorporating the use of aversive procedures, such as administering electric shock contingent on occurrence of the stereotypic response (Lovaas, Schaeffer, & Simmons, 1965; Risley, 1968). Koegel et al. (1974) used physical restraint combined with a loud, sharp, "No!" to suppress stereotypy. Additionally, in studies by Wells, Forehand, Hickey, and Green (1977) and Maag, Rutherford, Wolchik, and Parks (1986) overcorrection procedures were implemented to decrease nonfunctional object manipulation of objects (e.g., rotating a puzzle part on one finger; flipping a toy or toy part in front of the eyes or into the air; and string, cloth, or paper flapping). Although using aversive consequences or other punishers was once considered acceptable, their use to suppress stereotypic behavior was questioned on ethical grounds (Hobbs & Goswick, 1977; LaGrow & Repp, 1984). Additionally, punishment procedures are often associated with undesired side effects, including escape, avoidance, and aggression; likewise results tend to be temporary and restricted to specific stimulus conditions (Risley, 1968).

Reduction methods focusing on consequences such as sensory extinction to reduce the stereotypic behavior have also been explored. For example, Rincover, (1978) removed the sensory consequences of stereotypic object-twirling by carpeting the table on which the twirling occurred, thus eliminating the auditory and visual feedback associated with the behavior. The effectiveness of differential reinforcement of other behavior (DRO) to reduce stereotypy has also been investigated (Mulhern & Baumeister,
In these studies positive reinforcers such as praise and edibles were delivered contingent on responses other than self-stimulation. However, results from comparative studies suggest DRO is relatively less effective in reducing self-stimulatory behavior than are punishment procedures (Foxx & Azrin, 1973; Harris & Wolchik, 1979).

In other studies, experimenters have focused on increasing the frequency of a more appropriate replacement behavior by teaching specific responses to play materials, which resulted in the child’s engaging in higher rates of play behavior and lower rates of stereotypy (Greer et al., 1985). These researchers trained children to play with toys using procedures that were part of a toy-play teaching program. During sessions, the child was prompted to look at the toy, after which the trainer modeled appropriate toy play. The toy was then placed in front of the child, who was told, “You do it.” Then, depending on the child’s response, a reinforcer or a prompt was delivered. Similarly, Eason et al. (1982) focused on training appropriate play to children with autism by delivering praise and edibles for increasing durations of appropriate toy play during training.

Antecedent manipulations have consisted of removing the stimuli associated with stereotypy. In Risley (1968) stimuli associated with the client’s climbing behavior were removed prior to the child’s entering the room. This environmental rearrangement was followed by a decrease in the behavior and an increase in appropriate behavior. In Morrison and Rosales-Ruiz (1997), a preference assessment of teaching stimuli was conducted, and the items were then categorized as high-, medium-, or low-preference. Using the low- and medium- preference stimuli to train resulted in lower rates of
stereotypy and more accurate responding than when teaching with the high-preference stimuli.

Similarly, Hanley, Iwata, Roscoe, Thompson, and Lindberg (2003) investigated whether activity restriction alone would be sufficient to increase individuals’ engagement in lower preference activities or whether a reinforcement contingency would be necessary to achieve this effect. These experimenters found a Response Preclusion-based intervention was associated with increased engagement in lower probability activities after higher preference items are removed.

In Hoko and LeBlanc (1988) four discrimination tasks were taught to typically developing 4- and 5-year-old children. The children demonstrated increased acquisition when the experimenters eliminated characteristics irrelevant to the discrimination task. When the irrelevant dimensions were reintroduced, the children demonstrated acquisition in the presence of the characteristics that once interfered with learning. These results suggest removing competing stimuli from a learning situation increases the probability behavior will be controlled by relevant environmental stimuli remaining in the environment and that this control will be demonstrated after reintroduction of stimuli that once competed with learning.

The present study examines the effects of removing stimuli (response preclusion) evoking stereotypic behavior on the rates of stereotypic and play behavior.
CHAPTER 2

METHOD

Participants

The participant in this study was a 6-year-old male with autism. He had a history of engaging in potentially hazardous behaviors (licking wooden blocks and climbing on furniture). It was necessary that an adult be with the child at all times because the likelihood of the child engaging in these, as well as other dangerous behaviors, was quite high. Additionally, he was considered an elopement risk.

The relatively few types of play materials the participant contacted prior to the present study included puzzles, beads, blocks, and manipulatives (any connecting toys consisting of pieces that can be snapped together and pulled apart).

The child possessed a vocal repertoire consisting primarily of one-word responses, which were often prompted, and he was able to respond appropriately to several one-step instructions (e.g. “Sit down;” “Stand up;” “Give me ____.”). The child had demonstrated extensive gross motor skills and was physically capable of engaging in activities such as running, riding a bicycle, swinging, and climbing.

Setting and Materials

The experiment was conducted at the participant’s preschool in the room designated as the “social zone.” This room was equipped with play materials including toys from six different categories: blocks, manipulatives, figurines and dolls, vehicles, play theme props, and “other” types of play materials. In the current study, examples of play materials falling under the category of “other” included “car mountain” (a hard plastic mountain with tunnels, ramps, and a crane), balls, books, colored plastic rings, a push
toy (has wheels and small colored balls that “pop” inside a transparent plastic bubble when the toy is pushed), a set of wooden railroad tracks pieces that interlock, and a toy barn. Non-play material items in the room were 2 adult-size tables, 1 child-size table with 4 matching chairs, 6 to 10 adult-size chairs, 10 to 15 child-size classroom chairs, a set of shelves on which play materials were stored, and a small set of shelves with books.

During observation sessions the participant was the only child in the room. A designated adult videotaped the child, and the experimenter stood inside the room by the closed door observing the child. All sessions were recorded onto videocassette.

Observation and Measurement

Behavioral definitions. Throughout all sessions five categories of response classes were observed—1) simple manipulation, 2) functional manipulation, 3) licking, 4) climbing, and 5) prompting/redirecting by an adult. Frequency counts of all five categories were collected for each 10 min session, and each 10 min session was scored in 1 min intervals. For each response scored, the observer also recorded type of play material contacted. Simple manipulation was scored when the child engaged in a single movement or action with a play material that did not include the function for which it was intended (Gudmundsdottir, 2002). For example, tapping a play material, waving a play material in the air, or pulling off a manipulative piece from a larger manipulative construction was counted as simple manipulation. Functional manipulation consisted of contact with play materials according to their conventional characteristics or function (Gudmundsdottir, 2002), such as building a tower with blocks, placing a car on a ramp so it slides down, or turning the faucet knob of a play sink.

Climbing behavior was scored when the child put one or both knees, or one or both
feet on a chair, table, or any surface at least 1 ft off the ground. Also, each time the child
placed at least one foot on a new surface was counted as a new occurrence of climbing.
For example, if the child walked across a row of chairs, each time at least one of his feet
came in contact with a different chair from the one on which he had been standing
previously, an occurrence of climbing was scored. If he walked across a long table it was
counted as only one occurrence of climbing because the table is a single surface.
Climbing ended when both feet were back on the floor.

Onset of licking behavior was recorded if the child’s tongue or lips made contact with
the play materials, and offset of the behavior was defined as occurring when the child’s
tongue or lips were no longer touching the material. Although block-licking specifically
was the concern in this study, licking of any items was scored under this category.

Blocking or redirection was recorded if the experimenter physically guided or vocally
instructed the child to get off of an elevated surface and back onto the floor or when the
experimenter physically guided or vocally instructed the child to remove a play material
or other item from his mouth.

Observation and recording. Observations were made approximately 2-3 times/week.
Because the child engaged in the target behaviors at such high rates and often
simultaneously, the experimenter videotaped all sessions in both conditions and
collected data on target behaviors from the videotape. For those who assisted with the
videotaping, the following instructions were provided: 1) Keep the child in view from the
front. Follow him around and adjust your position when necessary; 2) Keep child in view
from head to toe when he is running, walking, climbing; 3) Keep his hands and face in
view when he is engaged with play materials; 4) Stay at least 2 _ ft away from the child; and 5) Do not interact with the child.

When the session tapes were viewed, two timers were used simultaneously to reduce the likelihood of the observers recording data in the wrong interval. One timer was set to count up from 0 s and the second timer beeped at 1 min intervals.

During observation sessions the person videotaping the session recorded the experimenter walking into the room with the child and saying to the child, “Go play.” It was this constant instruction, which initiated each session that signaled to the primary and reliability observers to begin collecting data. Data collection ceased when the timer indicated 10 min had elapsed.

Interobserver agreement (IOA). Three observers assisted with reliability observation. Two were University of North Texas students, and the third, was an adult not attending the university.

During training, the experimenter introduced the definitions and explained the recording system. Practice tapes were viewed and used to record data until at least 80% reliability was achieved. Both observers then began scoring tapes for the actual reliability data.

All IOA sessions were conducted using the same television and videocassette recorder. To increase observer independence during scoring either a partition was present between the two observers or one observer sat on the sofa directly in front of the television while the other observer, out of view from the first, recorded data while seated on the floor to the right of the sofa. Additionally, both observers used mechanical pencils or pens because they did not signal to the other person when a mark was recorded.
The following steps were taken to calculate the IOA: 1) For each interval, the number of agreements and the total number of agreements plus disagreements for both observers was determined, 2) the total number of agreements for all 10 sessions were added, 3) the total number of agreements plus disagreements for all 10 sessions were added, and 4) the total number of agreements was divided by the total number of agreements and disagreements to obtain a percent.

IOA data were as follows: Simple manipulation- 72%, Functional manipulation 82%, Licking-94%, Climbing- 96%, and Prompting 92%.

**Procedures**

*Baseline.* The experimenter brought the child into the room, said to him, “Go play” at the beginning of each session, and then stood by the closed door while the child was videotaped. The participant was allowed to engage in whatever activity he chose as long as it was not a dangerous one. If the experimenter believed the child to be in a potentially hazardous situation, she could intervene in any combination of ways including the following: by delivering a vocal instruction specific to terminating the child’s current behavior (e.g. “feet on the floor.”), by vocally instructing the child to “Go play,” by physically removing the child from the potentially harmful situation, by rearranging the environment to decrease the probability of the child’s re-encountering the situation, by requesting assistance from the person taping the current session, or by ending the session. Assistance from the second adult was never required and the session was terminated on three occasions when the child began to have a bowel movement and was rushed to the bathroom. Another example of an occurrence requiring experimenter intervention was when the child stood on an unsteady surface. The experimenter said to
the child, “Feet on the floor,” and would make certain he complied with the instruction by walking over to him and, if necessary, physically removing him from the surface. Typically, the child responded to the vocal instruction when it was given. This type of instruction and any other blocking and redirecting were recorded on the "Blocking/Redirecting" data sheet.

Response preclusion I. This condition differed from baseline in that all furniture such as tables, chairs, and wooden kitchen play materials (stove, sink, cabinets) were removed. The play materials (smooth, unpainted wooden blocks) with which the child engaged in licking behavior also were removed. The only piece of furniture that remained was a set of shelves approximately 2 ft high. A large number of the play materials in the room were stored on the shelves and to remove them would mean all those play materials would have to be placed on the floor. Although the shelf remained in the room, the experimenter placed several bins on top of it to discourage climbing. During baseline and for the first half of the first response preclusion condition these shelves were along either one of two walls in the room. After the participant began climbing onto the windowsill of the one-way window in the room, the shelves remained placed along the wall with the window. (This wall was one of the original two walls along which the shelves had been placed originally.) All other procedures and protocols remained the same as those described for baseline conditions.

Response preclusion II. Because data indicated the participant contacted a particular set of manipulatives most often, these and all other manipulatives were removed from the room during this condition. The wooden blocks remained out of the
room during this phase as well. This condition lasted two weeks. All other procedures and protocols remained the same as those described in baseline conditions.

*Experimental design.* In the current study there were three phases: (A) Baseline, during which blocks, elevated surfaces, and play materials were available; (B) Response Preclusion I, during which blocks and elevated surfaces were unavailable and play materials were available; and (C) Response Preclusion II, during which blocks, elevated surfaces, and manipulatives were unavailable and all five remaining play material categories were available. Eight phase changes occurred: four baseline phases, three Response Preclusion I phases, and one Response Preclusion II phase. The design took place in the following order: ABABABCA
CHAPTER 3
RESULTS

Figure 1 shows the participant’s licking (closed circles) and climbing (X’s) responses/minute and the experimenter’s blocking and redirecting (open circles) responses/minute. During the first baseline, climbing occurred at rates ranging between 1-22 responses/min, and licking occurred at rates ranging between 0-15 responses/min. With the exception of sessions two and eight (0 responses/min), licking occurred at relatively stable rates ranging between 8-15 responses/min. Climbing however, followed an increasing trend that stabilized in the last five baseline sessions. Blocking/redirecting occurred in 6 out of the 11 sessions at rates ranging from 0-.3 responses/min.

During Response Preclusion I, licking and climbing rates decreased significantly. Climbing occurred at rates ranging between 0-1.2 responses/min, and licking occurred at rates of 0-.5 responses/min. During Sessions 5-8, the participant climbed onto the windowsill of a one-way window in the room. To block this climbing opportunity the shelves were rearranged to block the windowsill after Session 8. Rates of climbing decreased to 0 and .1 responses/min from Sessions 9-12. Blocking/ redirecting occurred once (.1 responses/min) in Session 11.

During the first return to baseline condition licking did not occur at all, and climbing was variable at rates ranging from 0-3.5 responses/min. One instance (.1 responses/min) of blocking/redirecting occurred in session 5.

During the second implementation of Response Preclusion I, no licking, climbing, or blocking/redirecting occurred.
During the third baseline, no licking occurred, and climbing was characterized by an increasing trend beginning with a rate of .8 responses/min and ending with a rate of 15 responses/min. Blocking/redirecting occurred at a rate of .3 responses/min during each of the final 3 sessions.

In the third Response Preclusion I condition, no instances of licking occurred and only one instance of climbing (.1 responses/min) occurred in the first session. Blocking/redirecting occurred at a rate of .1 responses/min during each of two sessions.

During Response Preclusion II, licking behavior occurred at a rate of .5 responses/min in the first session (the child licked a wooden railroad track segment). In the third and fourth sessions, the child engaged in climbing behavior at rates of .3 responses/min and .1 responses/min, respectively. In the third session of Response Preclusion II, the participant removed the crane arm from a toy, leaving essentially a 2 foot tall tower on which he could stand with one foot, and in the fourth session, he put one foot onto a shelf momentarily. Both of these actions met the climbing definition, thus they were scored. Blocking/redirecting occurred in the final 3 sessions at rates of .2, .8, and .2 responses/min, respectively.

During the final phase (baseline) the only target behavior that occurred was climbing in the second session (.2 responses/min). There was no blocking/redirecting during this phase.

Figure 2 illustrates the participant’s simple manipulation (closed circles) and functional manipulation (X’s) responses/minute. During the first baseline, simple manipulation occurred at rates of .5-4.5 responses/min, and functional manipulation rates fluctuated between 0-2.2 responses/min.
During Response Preclusion I frequency of both simple and functional manipulation increased. Simple manipulation rates ranged from 1.2 to 4.5 responses/min, and functional manipulation rates ranged from .4-3 response/minute. Additionally, the data for both simple and functional manipulation were less variable relative to baseline.

During the second baseline, simple and functional manipulation rates were similar to those reported in the previous phase (Response Preclusion I). Simple manipulation occurred at rates ranging from .9-5 responses/min, and functional manipulation, at rates from 1-3.9 responses/min.

During the second implementation of Response Preclusion I, rates for simple and functional manipulation were similar to the two previous conditions. Rates of simple manipulation were 2, 2.9 and 2.5 responses/min, and functional manipulation rates were 1.5, 1.4, and 2.2 responses/min.

During the third baseline, simple manipulation maintained between 2 and 4 responses/min for the first four sessions then dropped to .9 in the last session. Functional manipulation decreased from 3.3 responses/min to .5 responses/min.

During the third implementation of Response Preclusion I conditions, simple manipulation rates occurred within the range of 2 and 4 responses/min, and functional manipulation rates occurred within the range of 1.2 and 5 responses/min.

During Response Preclusion II, responding decreased initially. Simple and functional manipulation rates were both .5 responses/min in the first session. However, the rates for both play responses increased over the next three sessions, and the final rates for simple and functional manipulation in this condition were 2.2 and 2 responses/min respectively.
During the final baseline, rates for simple manipulation were 2.2, 2.8, and 4 responses/min, and rates for functional manipulation were 3.9, 4, and 2.5 responses/min.

Figure 3 shows the types of play materials (closed circles: manipulatives; open triangles: vehicles; open circles: “other” toys; open diamonds: play theme props; X’s: figurines and dolls; +’s: blocks) available to the participant and the number of times/minute he engaged in functional manipulation with each one of them. During baseline, the rates at which he contacted manipulatives within a session ranged from 0.05-2.3 responses/min. The participant engaged in functional play with manipulatives in 5 out of the 11 sessions in this condition. He also engaged in functional manipulation with toys falling in the “other” category in two sessions (.4 and 1.5 responses/min, respectively).

During Response Preclusion I, the participant contacted manipulatives in 11 out of the 12 sessions. The values ranged from 0.05-2.9 contacts/min. Additionally, the participant made contact with “other” toys in sessions 3, 4, and 5 (.9, .4, and .1 contacts/min, respectively), and in session 9 he engaged in functional manipulation at a rate of .1 responses/min with a play material in the vehicle category.

During the second baseline, the child contacted manipulatives in all 12 sessions, and the rates at which he engaged in functional manipulation with these materials ranged from 1.0-3.8 responses/min. He also contacted play theme props at a rate of .1 responses/min in two sessions (6 and 12), and he engaged in functional manipulation at a rate of .2 responses/min with “other” toys in session 8.

During the second implementation of Response Preclusion I, the participant engaged in functional manipulation with manipulatives at rates of 1.4, 1.3, and 2.0 responses/min.
Manipulatives were the only type of play material the child contacted during this condition.

During the third baseline, the child contacted only manipulatives once again, but the data indicate a decreasing trend. The rate of responding in the first session was 3.3/min, and in the last session the rate of responding was .5/min.

During the third implementation of Response Preclusion I, the rate of contacts increased once again. The rates at which the participant contacted manipulatives were 3.8, 1.2, 4.6, and 3.7 contacts/min. The child did not engage in functional play with any other play materials in this session.

During Response Preclusion II an immediate decrease in functional manipulation occurred. Manipulatives could not be contacted during this condition, but the child did engage in functional manipulation with vehicles and “other” toys. In this phase, the “other” play materials the participant manipulated were the “car mountain” and a wooden railroad track set. The rates at which he engaged in functional manipulation with these materials for the four sessions are as follows: vehicles-.3, 1.2, 1.3, and .2 contacts/min; “other”-.2, .5, .7, and 1.7 contacts/min.

In the final baseline, the child contacted manipulatives at rates of 2.1, 2.7, and 4.2 contacts/min across the three sessions.
CHAPTER 4

DISCUSSION

The results in the current study show that licking and climbing occurred at high rates during the first baseline, and simple and functional manipulation occurred at substantially lower rates than did licking and climbing. When Response Preclusion I was introduced, licking and climbing decreased to near-zero rates across the Response Preclusion I conditions and continued to decrease across reversals and virtually disappeared by the last phase (baseline) of the study. Simple and functional manipulation rates increased and stabilized during the first introduction of Response Preclusion I and continued to be maintained across all phases of the study. These results suggest that response preclusion not only prevents the target behavior, but it may result in increased engagement in desired behavior as well. Similar results were obtained by Risley (1968) and Morrison and Rosales-Ruiz (1997). For example, in his study, when Risley (1968) prevented a child’s climbing by removing the opportunity to climb, the child’s climbing behavior could not occur, but more significantly, the experimenter was able to teach the child to engage in desired responses, such as eye contact and motor imitation. Similarly, in Morrison and Rosales-Ruiz (1997) stereotypy associated with specific teaching stimuli interfered with a child’s learning a counting task. Removing the stimuli associated with stereotypy was followed by an increase in task-related correct responding. The results from these studies and the present study suggest eliminating competing sources of control facilitates learning.

When compared to other types of interventions the response preclusion procedure employed in the present study has several benefits including its relative simplicity. Many
studies addressing play have featured highly structured interventions that included instructions, prompts, and reinforcers (e.g., Goldstein & Cisar, 1992; Goldstein et al., 1992; Greer et al., 1985; McEvoy et al., 1988; Nuzzolo-Gomez, et al., 2002; Santarcangelo et al., 1987). Similarly, interventions addressing stereotypic responding typically involve consequences for the target behavior and the teaching of alternative behavior (e.g., Koegel et al., 1974; Lovaas et al., 1965; Maag et al., 1986; Rincover, 1978; Risley, 1968; Wells et al., 1977). By contrast, the current study did not involve instructions, prompts, or experimenter-delivered reinforcers, but rather it only entailed removal of specific items from the experimental setting. It is worth noting however, that some blocking or redirecting of the student’s licking and climbing behavior occurred when the experimenter believed it could be a safety concern. Blocking/redirecting occurred at low rates and did not occur in every session.

Although implementing response preclusion in the current study could have resulted in the replacement of licking and climbing with another maladaptive behavior, no such effects were seen in the study, and instead, a decrease in stereotypic responses across all conditions occurred. The most notably affected behavior was licking, which virtually dropped out after implementation of the first Response Preclusion I condition. A possible explanation for this effect is that licking and/or climbing may have been attention maintained. Outside the experimental setting adults often redirected licking and climbing. By contrast, during experimental sessions these responses were ignored, so perhaps over time, lack of attention contributed to the decreased rates of licking and climbing.

In addition to the changes seen in licking and climbing responses, simple manipulation rates stabilized, and functional manipulation rates increased, stabilized, and
failed to return to baseline rates of responding. These effects are especially significant, not only because the participant engaged in relatively low rates of functional manipulation relative to his peers, but also because functional manipulation is considered a more complex play behavior than simple manipulation. However, these results were somewhat unexpected. A possible explanation for this maintenance effect is that with each Response Preclusion implementation, the child had the opportunity to contact reinforcers associated with manipulation of play materials, thus increasing the likelihood of the child’s engaging in play behavior rather than licking and climbing, even in the presence of blocks and elevated surfaces. Support for this effect was shown by Hoko and LeBlanc (1988), who trained children to discriminate among several similar stimuli on a computer screen by making the stimuli equal with respect to certain characteristics. When interfering stimulus dimensions were removed, the children learned the target discriminations. Evidence of acquisition was demonstrated when participants responded to the correct stimulus in the presence of the once interfering characteristics. Similarly, in the current study, removing certain stimuli from the environment may have created a stimulus condition in which the participant was more likely to contact other stimuli (play materials) and therefore, more likely to be provided with reinforcers intrinsic to the activity.

As the study progressed, data indicated the child engaged in higher rates of functional manipulation with manipulatives than with other play materials. To replicate effects seen after implementation of Response Preclusion I, a new condition (Response Preclusion II) was implemented in which all manipulatives were removed from the room. The most significant effect within Response Preclusion II, lies in the participant’s
contacting vehicles and “other” play materials when manipulatives were no longer available. However, this effect did not maintain after reintroduction of manipulatives. Not only are these results consistent with those obtained by Hanley et al. (2003) in their study of activity preferences but also they suggest delivery of reinforcers may be necessary to maintain the behavior change.

Another possible reason why the behavior change in Response Preclusion II did not maintain is that this condition was implemented only once due to time limitations. It is recommended that future research assess this possibility as well as parameters such as study duration (e.g., number of weeks the entire study spans) and number of times each condition is implemented.

In addition to the benefits regarding target responses, Response Preclusion may also improve the rapport between teacher and student as the number of reinforcers each provides the other increases. Another possibility for future research would call for defining and measuring “rapport-related” responses (e.g., smiling, laughing, hugging, etc.) and determining if these measures change as a function of a response preclusion-based teaching interaction.

Anecdotal observation of the current participant indicated that on several occasions, he engaged in commenting responses while putting together the set of manipulatives he was observed to contact most often. These responses included pointing at the pieces and labeling the colors, numbers, or letters on them. Although his teachers knew he emitted some vocalizations they had not observed his spontaneous comments previously. Evaluating the effect of response preclusion on commenting behavior could
provide helpful information for creating teaching interactions that maximize the student’s learning.

Removing stimuli that may interfere with an individual’s contacting other reinforcers and stimuli can create an environment that improves likelihood of success for both the student and the teacher. More research is necessary however, to determine the following: 1) which factors predict whether or not response preclusion procedures merely prevent behavior or alter its overall likelihood of occurrence, and 2) whether eliminating competing sources of control enhances the probability of behavior coming under control of relevant variables. At the very least, response preclusion can produce initial conditions more conducive to the training and maintenance of desired behavior.
Figure 1. The participant's stereotypic behavior and adult's blocking/redirection across conditions.

STEREOTYPIC BEHAVIOR

- Climbing
- Licking
- Block/Redirect
Figure 2. The participant’s play behavior across conditions.

PLAY BEHAVIOR

- Simple Manipulation
- Functional Manipulation

COUNT PER MINUTE

RESPONSE PRECLUSION I  RESPONSE PRECLUSION I  RES. PREC. I

BASELINE  BASELINE  BASELINE

SUCCESSIVE CALENDAR DAYS
Figure 3. The participant's engagement in functional manipulation of the different play material types across conditions.

FUNCTIONAL MANIPULATION
OF PLAY MATERIALS

• Manipulatives  ▲ Vehicles  ○ Other  ○ Play Theme  × Fig & Dolls  + Blocks

COUNT PER MINUTE

RESPONSE PRECLUSION I  RESPONSE PRECLUSION I  RES. PREC. I

SUCCESSIVE CALENDAR DAYS
REFERENCE LIST


