Reinforcement of Compliance with Positive and Negative Commands and Its Effect on Inappropriate Behavior in Children

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This study examined reinforcement of compliance with positive ("do") and negative ("don't") commands, along with its effects on inappropriate behavior in children. The design of the study was A-B-A-C-B-C counterbalanced across two subjects. In both subjects, reinforcement of compliance to "do" commands resulted in increased compliance to this type of command. Similarly, reinforcement of compliance with "don't" commands resulted in increased compliance to "don't" commands. In addition, a tendency for compliance with the reinforced type of command to generalize to the nonreinforced type was observed in some phases. Response covariation was also observed in some phases. Response covariation was also observed in some phases between compliance with both types of commands and inappropriate behavior. Additionally, there was a tendency for the number of "don't" commands to increase in frequency concurrent with increased compliance to "don't" commands. Probable causes for this effect and concern about the reinforcement of "don't" commands are discussed.

Noncompliance has repeatedly been identified as one of the most serious, frequent, and pervasive behavior problems of childhood (Forehand, 1977; Neef, Shafer, Egel, Cataldo, & Parrish, 1983; Patterson & Reid, 1973; Stiffman, 1982; Taplin & Reid, 1977). Johnson, Wahl, Martin, and Johansson (1973) found that of 13 observed deviant child behaviors, noncompliance (i.e., failure to comply with requests within a specified period of time) was found among children more frequently than any other aberrant behavior. Although Johnson et al. (1973) found noncompliance in normal children to occur in one-third of the opportunities for compliance, studies of children referred for treatment have shown rates of noncompliance to be much higher. Bernal, Klinnert and Schultz (1980) found 35 out of 36 parents of children referred for psychological treatment report some difficulty with this problem.

The type of command given to a child has been the target of several investigations concerning noncompliance (Elrod, 1987; Forehand, 1977; Glass, 1988; Houlihan, 1989). Most of these studies have focused on positive ("do") commands (e.g., Forehand, 1977; Hamlet, Axelrod, & Kuerschner, 1984; Parrish, Cataldo, Kolko, Neef, & Egel, 1986) with little attention given to negative ("don't") commands (e.g., Houlihan & Jones, 1990; Neef et al., 1983).

Neef et al. (1983) studied the effects of "do" and "don't" commands on compliance in children with mentally handicapping conditions. They found that reinforcement of both "do" and "don't" commands increased compliance to those types of commands but did not generalize onto each other. No functional relationship between compliance with "do" commands and "don't" commands was found. It was, therefore, concluded that compliance with "do" and "don't" commands serves as functionally distinct response classes. Houlihan and Jones (1990) have since found evidence supporting this conclusion, indicating that reinforcement of both "do" and "don't" commands may be necessary to increase compliance.

Investigators have also suggested that since "do" and "don't" commands appear to be function-
ally distinct response classes, these commands may exert a different effect on certain topographically different behaviors. To investigate this hypothesis, Parrish et al. (1986) researched the effects of reinforcement of “do” commands on inappropriate behaviors. They concluded that an inverse relationship exists between compliance and inappropriate behaviors (e.g., aggression, disruption, property destruction, and pica).

Although Parrish et al. (1986) suggested the existence of response covariation, they failed to demonstrate that a similar relationship would exist with “don’t” commands. Additionally, while some researchers (Neef et al., 1983) recommended the reinforcement of both “do” and “don’t” commands as a means to further enhance compliance, research done to date (Glass, 1988; Houlihan & Jones, 1990; Parrish et al., 1986) has failed to establish the value of doing this.

The present study attempts to establish that reinforcing compliance to both “do” and “don’t” commands is necessary for compliance with both types to occur, and second, to determine whether “don’t” commands demonstrate the same ability as “do” commands in affecting a change in inappropriate behaviors. It is hypothesized that the type of command used will differently effect the level of inappropriate behavior displayed.

Method

Subjects

Two boys, age five, participated in this study. Each child had been identified by his teacher and the program director of the preschool they attended as being noncompliant with adult commands and as exhibiting high levels of inappropriate behavior. Inclusion in the study was based on (a) receptive language skills to enable the children to respond to one-step commands; (b) a history of some compliance with adult commands; (c) general compliance with adult commands occurring 60% or less, as previously assessed; and (d) the occurrence of inappropriate behaviors at least 15% of the time observed.

Setting

Sessions were conducted in a preschool classroom in which 15-20 children were present, along with one teacher and at least one aide. The classroom was arranged with one work area designated specifically for working with the participants. This area was not sectioned-off from the rest of the classroom but was kept clear of other students while sessions were conducted. The area was equipped with a work/play table and three chairs. Each child had free access to toys such as blocks, books, cars, Transformers, Lincoln Logs, Legos, board games, puzzles and a plastic bucket. Some of these toys were used as targets in positive commands (e.g., “Put the black car in the bucket”). There was one 30 minute session each day for a total of 36-37 sessions.

Target Behaviors

Compliance. Each child’s compliance to adult commands was recorded. “Do” commands consisted of instructions to initiate a response. Compliance to these positive commands was defined as the initiation of a requested action within 20 seconds of the initial command (e.g., Neef et al., 1983). “Don’t” commands consisted of instructions to terminate an ongoing behavior. Compliance to such negative commands was defined as the cessation of an inappropriate behavior within 20 seconds of the initial command. Commands targeted for this study were selected and modified from Neef et al. (1983), Stiffman (1982), Parrish et al. (1986), and Houlihan and Jones (1990) (see Table 1). These commands have been found to be common in the classroom, yet are only occasionally complied with by students.

Inappropriate behavior.

The inappropriate behaviors used in this study were determined from baseline results and have been used in previous studies (e.g., Parrish et al., 1983; Parrish et al., 1986). Disruption was defined as whining, crying, screaming, climbing on furniture, hitting or kicking another person, leaving the table, stamping of foot loudly on floor, or taking another person’s property. Property destruction
was defined as throwing an object or tearing or breaking educational materials.

<table>
<thead>
<tr>
<th>Table 1: List of Commands Used</th>
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<tbody>
<tr>
<td><strong>Positive Commands</strong></td>
</tr>
<tr>
<td>Change seats with me.</td>
</tr>
<tr>
<td>Raise your hand above your head.</td>
</tr>
<tr>
<td>Give me the blue ball from the bucket of toys.</td>
</tr>
<tr>
<td>Hand me the ___</td>
</tr>
<tr>
<td>Touch ___</td>
</tr>
<tr>
<td>Clap your hands ___ times.</td>
</tr>
<tr>
<td>Put the ___ in the bucket.</td>
</tr>
<tr>
<td>Stand up/sit down.</td>
</tr>
<tr>
<td>Stand on one foot.</td>
</tr>
<tr>
<td>Count the number of ___ in the bucket.</td>
</tr>
<tr>
<td><strong>Negative Commands</strong></td>
</tr>
<tr>
<td>Don't touch ___</td>
</tr>
<tr>
<td>Don't get out of your seat.</td>
</tr>
<tr>
<td>Don't hit.</td>
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<tr>
<td>Don't yell.</td>
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<tr>
<td>Don't play with ___</td>
</tr>
<tr>
<td>Don't throw ___</td>
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<tr>
<td>Don't run.</td>
</tr>
</tbody>
</table>

*Note: Commands were adapted from Heaf et al. (1983), Parrish et al. (1988), and Stiffman (1982).*

**Procedure.**

Prior to any data collection, the experimenter met with the parents of the children involved in the study to explain the procedures, goals, and purpose of the investigation, and to receive written parental consent for their child to participate.

**Baseline.** During baseline, data was collected on compliance with both types of commands but compliance was not reinforced. "Do" commands were delivered randomly ten times during each session as signalled by a beep on a tape heard only by the investigator through the use of a concealed earphone. Data was also collected on inappropriate behaviors during baseline and across experimental conditions. This data was collected during ten 20-second probes conducted within each 30-minute session. The probes were signalled by two beeps on a tape and occurred at any time except during the 20 seconds immediately after a positive command was given by the investigator. The experimenter did not have control over when the need for a negative command would arise and on some occasions a probe was signalled during the 20 seconds following a "don’t" command.

**Reinforcement of Compliance to “DO” Commands.** Procedures during this condition were identical to those during baseline except that compliance to “do” commands occurring within 20 seconds after delivery of the command was reinforced with a token. Each child received 10 “do” commands each session. When a child had collected at least two tokens, he could exchange them for more desirable material rewards (e.g., stickers, vegetable-person pencil tops, finger puppets, plastic miniature airplanes, and “Caterpillars”). Each reward required a different number of tokens before an exchange could take place. During this condition, “don’t” commands were given when necessary, however, compliance to “don’t” commands was not reinforced.

**Reinforcement of Compliance to “Don’t” Commands.** Procedures during this condition were identical to those during baseline except that compliance to “don’t” commands occurring within 20 seconds after delivery of the command were reinforced with a token. Because of the need for the child to first initiate an inappropriate behavior, it was not possible to control the number of “don’t” commands made in each session. Each time a child complied within the time limits he was rewarded with a token. When a child had collected at least two tokens he could exchange them for another reward (e.g., stickers, vegetable-person pencil tops, finger puppets, plastic miniature airplanes, and “Caterpillars”). Each reward required a different number of tokens before an exchange could take place.

**Program Design.**

The design used in this study was an A-B-A-C-B-C design that was counterbalanced across subjects (Kazdin, 1982). Subject 1 received treatments in the following order: A-B-A-C-B-C, with “A” being baseline, “B” being reinforcement of compliance with “do” commands, and “C” being reinforcement of compliance with “don’t” commands.
Subject 2 received treatments in this order: A-C-A-B-C-B.

Observer Reliability.

Measures of interobserver agreement were obtained weekly during 22% of the sessions, across all measures and children. Reliability was determined by comparing the records of two observers, one of which was the experimenter, and dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. Reliability was calculated as being 97.5% (80%-100%) when scoring compliance to “do” commands, 92.7% (50%-100%) when scoring compliance to “don’t” commands, and 96.9% (80%-100%) when scoring inappropriate behavior.

Results.

Figures 1 and 2 show the results of the counterbalanced A-B-A-C-B-C(A-C-A-B-C-B) design across both children, expressed as the percentage of compliance with “do” and “don’t” commands and percentage of probes during which inappropriate behavior was observed. These data are summarized in Table 2 which contains the mean percent compliance with “do” and “don’t” commands and the mean percent inappropriate behavior, along with their ranges.

Specific findings will be discussed separately for each child and then will be compared.

Figure 1 shows the level of compliance for Subject 1 (top graph) and his level of inappropriate behavior (bottom graph). In his initial baseline, compliance to “do” and “don’t” commands showed some stability in the beginning sessions with greater stability reached by the end of baseline. Compliance to “don’t” commands occurred at a relatively high rate especially when compared to compliance with “do” commands. Inappropriate behavior occurred at a moderate rate with moderate variability.

Figure 1: Percent compliance with “do” commands (open squares), compliance with “don’t” commands (closed triangles), and % inappropriate behavior (closed squares) for Subject 1.

Figure 2: Percent compliance with “do” commands (open squares), compliance with “don’t” commands (closed triangles), and % inappropriate behavior (closed squares) for Subject 2.
Following the introduction of reinforcement for compliance with “do” commands, an immediate increase in compliance with this type of command was shown. “Don’t” commands remained near baseline levels while the rate of inappropriate behavior decreased and became less variable.

A return to baseline resulted in a downward trend for compliance with “don’t” commands and decreased rate and variability in compliance with “do” commands. An increase in inappropriate behavior occurred along with an increase in variability. When compared to the previous baseline phase, compliance and inappropriate behavior showed similar rates.

Introduction of reinforcement for compliance with “don’t” commands resulted in increased compliance with this type of command, as well as a slight increase in compliance with “do” commands. Inappropriate behavior decreased and became less variable.

Resumption of reinforcement for compliance with “do” commands increased compliance to this type of command while compliance with “don’t” commands decreased slightly but still remained at higher levels than baseline. Inappropriate behavior increased slightly and became more variable.

Resumption of reinforcement for compliance to “don’t” commands resulted in increased compliance to this type of command while compliance to “do” commands decreased slightly. Inappropriate behavior remained stable.

Figure 2 shows the level of compliance for Subject 2 (top graph) and his level of inappropriate behavior (bottom graph). In his initial baseline, compliance to both types of commands were consistent, though compliance with “don’t” commands showed much more variability than compliance with “do” commands. Compliance to “don’t” commands also showed a higher mean than compliance to “do” commands. Inappropriate behavior occurred at a moderate rate with moderate variability.

Introduction of reinforcement for compliance with “don’t” commands resulted in increased compliance to this type of command and much less variability. Compliance to “do” commands remained at baseline levels while inappropriate behavior increased slightly in rate and variability.

Return to baseline resulted in decreased compliance with “don’t” commands and increased variability, though not to the levels found in the previous baseline. Compliance to “do” commands remained at previous levels as did inappropriate behavior.

Introduction of reinforcement for compliance with “do” commands immediately increased compliance to this type of command, as well as to “don’t” commands. However, these increases were short in duration, lasting only four sessions before greatly decreasing. A large decrease in inappropriate behavior occurred.

Resumption of reinforcement for compliance with “don’t” commands again increased compliance to this type of command, as well as decreased compliance with “do” commands to below baseline.
levels. Inappropriate behavior began to show an upward trend during this phase.

Lastly, resumption of reinforcement for compliance with “do” commands immediately increased compliance to this type of command, while compliance to “don’t” commands decreased slightly and became much more variable, as did inappropriate behavior.

Comparatively, Subject 1’s results were much more variable than Subject 2’s. As such, Subject 1’s compliance rates to both types of commands tended to overlap while Subject 2’s compliance rates to both types were more distinct and separate. Although compliance to “don’t” commands tended to be higher than compliance to “do” commands for both children during baseline, levels of compliance varied between subjects. Subject 2’s compliance to “do” commands was low except then this type of command was reinforced. Conversely, Subject 1’s compliance to “do” commands remained in the moderate to high rate even when compliance to “don’t” commands was reinforced.

Overall, results indicated that reinforcement of compliance to “do” commands increased compliance to this type of command. Similarly, reinforcement of compliance with “don’t” commands resulted in increased compliance to “don’t” commands. The results also show, in some phases, a tendency for compliance with the reinforced type of command to generalize to the nonreinforced type. Although this generalization did not occur in all phases, it does suggest that generalization across command types may exist. In addition to these results, response covariation was observed between compliance with both types commands and inappropriate behavior. Increased compliance was correlated with decreased inappropriate behavior. In additional finding was a tendency for the number of “don’t” commands to increase in frequency concurrent with increases in compliance to “don’t” commands.

Discussion.

The study of response class relationships has recently been advocated as an economical alternative to the traditional approach of modifying one behavior at a time (Houlihan, 1989; Neef et al., 1983; Parrish et al., 1986). Neef et al. (1983) has examined this phenomenon with respect to compliance. Their results demonstrated that compliance with “do” and “don’t” commands represents functionally distinct response classes. They, therefore, recommend that compliance to both types of commands be reinforced.

Results of this study do not completely support the claim by Neef et al. (1983) that compliance with “do” and “don’t” commands serve as functionally distinct response classes. While reinforcement of compliance with “do” and “don’t” commands did result in increased compliance to both types of commands for both children, compliance to one type of command did, in some cases, appear to generalize to the other type of command, though it did not occur in every phase with both children.

The results of this study also do not support the recommendation by Neef et al. (1983) that both compliance to “do” and “don’t” commands be reinforced if compliance to both is desired. Both children quickly learned that by increasing the rate of inappropriate behavior they were also increasing the number of opportunities (i.e., commands) for reinforcement. Thus, while compliance with “don’t” commands increased, so did the number of “don’t” commands given. This situation is undesirable, as well as counterproductive (Houlihan & Jones, 1990).

As reported by Houlihan and Jones (1990), several possible theories explaining why this increase in “don’t” commands were observed. First, Patterson’s (1979) “coercive chains” theory may explain this occurrence. Saying “don’t” to a child can be negatively reinforcing for teachers and parents if it succeeds in reducing the child’s undesired behavior. Because parents and teachers have been negatively reinforced, they are likely to increase their use of “don’t” commands in the future. The child may also be reinforced if the parent withdraws the command or if there is a reward for stopping the behavior. However, rather than
reinforcing compliance with the command, the parent may actually be reinforcing the entire chain of events leading up to the command. As a result, inappropriate behavior would likely increase along with the increase in “don’t” commands.

Second, Wahler and Dumas’ (1986) “predictability hypothesis” may be a plausible explanation. According to this hypothesis, the inappropriate behaviors of a child may be related to inconsistent reactions to the child’s behavior. For some children, a behavior that consistently results in a “don’t” command may be reinforcing to the child because it gives them some control over the situation and results in greater predictability (i.e., reinforcement).

Third, “don’t” commands may, over time, become both discriminative stimuli and conditioned reinforcers. Initially, don’t commands may signal that reinforcement will follow if compliance occurs. Later, “don’t” commands may become reinforcers simply through association with other reinforcers. If this is the case, inappropriate behavior would increase and precipitate a concurrent increase in the availability of a conditioned reinforcer.

In this study, only slight collateral changes were observed. From the literature (Houlihan, 1989; Parrish et al., 1986), one would expect this covariation to be more pronounced. Parrish et al. (1986) demonstrated that non-targeted behaviors reliably covaried with targeted ones. More specifically, compliance had a tendency to increase while inappropriate behaviors decreased and vice versa.

One possible explanation for failure to replicate the Parrish et al. findings may be due to differences in the type of observation systems used. Parrish et al. made use of a continuous-interval system. Another possible explanation is differences in design. For example, Parrish et al. observed several children simultaneously; group work was one of the conditions. The present study observed only one child at a time, perhaps lessening the occasions for inappropriate behavior. In addition, Parrish et al. investigated covariation in children with mild to moderate mentally handicapping conditions. The present study included children with no mentally handicapping conditions. Response covariation may be stronger in the latter children.

There were several limitations in this study. First, the teacher from the classroom in which both children were students left midway through the study. This may have confused the children and left them unsure of what behaviors would now be tolerated. Second, the duration of the study included a holiday during which one of the children (Subject 1) did not attend school for several days. This occurred between the 13th and 14th sessions. As can be seen from the data, there was a sharp drop in compliance rates immediately upon his return. Although the phase the child was in was extended to allow for re-learning of the condition, it may not have been enough. Third, the “special” attention given to the participants was slightly aversive to one of the children (Subject 2). He did not like to be singled-out from his classmates. This may have been avoided if the experimenter had spent additional time with all of the children.

There is a need to further investigate the conditions under which generalization of “do” and “don’t” commands occur. In addition, a continuous observation system is needed to establish whether an increased number of “don’t” commands negatively influences children’s levels of inappropriate behavior. A coding system that analyzes specific inappropriate behaviors (other than noncompliance) may also produce different results.

More research should also be done on the occurrence and non-occurrence of response covariation, especially in the natural setting with “normal” children. Several questions still remain unanswered. For example, under what conditions and with whom does response covariation occur most reliably? If response covariation proves to be useful in explaining the occurrence or non-occurrence of certain behaviors, then better, more efficient treatments for compliance and inappropriate behaviors should follow.

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