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REDUCTION OF DANGEROUSLY AGGRESSIVE BEHAVIOR IN A SEVERELY RETARDED RESIDENT THROUGH A COMBINATION OF POSITIVE REINFORCEMENT PROCEDURES[1]

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A severely retarded resident was released from a timeout chair only occasionally for brief periods of time. Under the timeout contingency alone, the subject made a choke response within minutes of being released. Attention, such as hugs, smiles, and candy was then increased, first by providing it non-contingently and continuously as long as there were no aggressive responses and then, by making it contingent upon incompatible responses. Under conditions of timeout plus increased attention, choking decreased abruptly. Grabbing responses, which increased when choking was reduced, were also reduced under conditions of timeout plus attention. Unrestrained time was gradually increased and all extra attention, *i.e.*, more scheduled attention than provided other residents, was gradually withdrawn. When the resident was unrestrained all day and all extra attention was withdrawn, grabs and, to a lesser extent, chokes increased. Both were again reduced to a manageable level by scheduling several brief periods of attention each day. Hence, the program resulted in quick reductions that endured when the program was largely withdrawn. The changes in aggressive responding as a function of the presence and absence of extra attention suggest the importance of extra "positive reinforcement" in programs based upon positive reinforcement procedures and dealing with retarded residents for whom positive reinforcers may be scarce.

Several behavioral techniques can be used to reduce the rate of an undesirable response. Probably the best known of these are extinction, reinforcement of an incompatible response, and punishment. Extinction involves only the discontinuation of reinforcement for a response. The incompatible response procedure typically involves conditioning one or more responses that are incompatible with the undesirable response and result in the same or more reinforcement than the undesirable response. Punishment can involve either of two procedures. One punishment procedure involves the presentation of an aversive stimulus, such as electric shock, following the response. The second involves the removal of a positive reinforcer, such as food, following the response. Hence, the two punishment procedures may be designated as punishment by presentation of an aversive stimulus and punishment by removal of a positive reinforcer, respectively.

In applied settings, these three behavioral techniques are frequently used in combinations to increase the likelihood of eliminating the undesirable response, *i.e.*, undesirable behaviors are extinguished and punished while incompatible responses are reinforced. Some studies have used punishment by aversive stimulation, *e.g.*, Bucher and Lovaas (1967), Tate and Baroff (1966); others have used punishment by removal of a positive reinforcer, *e.g.*, Wolf, Risley, and Mees (1964); Sloane, Johnston, and Bijou (1967). The latter combination involves only the manipulation of positive reinforcement to eliminate behavior.

The combination involving punishment by an aversive stimulus has been shown to be effective with responses that need to be reduced immediately (Bucher and Lovaas, 1967; Tate and Baroff, 1966; Lovaas and Simmons, 1969), and responses that cannot be eliminated with

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any other procedure (Risley, 1968). However, animal research has shown that punishment by an aversive stimulus can produce side effects such as aggression and escape from the punishment situation (see review by Azrin and Holz, 1966). Although human studies using aversive electric shock as the punishing stimulus have not found undesirable side effects (Risley, 1968; Lovaas and Simmons, 1969), many therapists prefer not to use it.

Several studies have shown that punishment by removal of positive reinforcers can also eliminate undesirable responses, *e.g.,* Wolf, *et al.,* 1964; Zeilberger, Sampan, and Sloane, 1968; Bostow and Bailey, 1969; Sloane, *et al.,* 1967. However, the combination involving only positive reinforcement does not seem to have been as effective as the one involving punishment by aversive stimulation. For example, punishment by means of a reduction in positive reinforcement did not eliminate undesirable climbing behavior, whereas punishment by means of an aversive stimulus did (Risley, 1968). Lovaas and Simmons (1969) found punishment by a reduction in positive reinforcement to be effective in eliminating self-destructive responses, but it took so long that its practical value in preventing physical injury was questionable. The incompatible response procedure has a similar drawback. Lovaas, Freitag, Gold, and Kassorla (1965) and Peterson and Peterson (1968) have shown that this procedure can reduce self-destructive behavior, but the time required to condition incompatible responses makes the procedure less practical than punishment by aversive stimulation. It appears that neither the incompatible response procedure nor punishment by the removal of a positive reinforcer are as fast or as effective as punishment by an aversive stimulus.

The present study attempted to provide a program involving a combination of procedures that used and manipulated positive reinforcement to produce a reduction in aggressive behavior that would occur quickly and endure when the program was withdrawn. As in previous studies in which punishment by aversive stimulation has been used, the present research was done with a deviant subject, a severely retarded resident, whose aggressive responses occurred at a high rate and were dangerous.

The first objective of the program was a fast reduction in aggressive behavior. Since the effectiveness of a combination of procedures involving only the manipulation of positive reinforcement necessarily depends upon positive reinforcement, and since there is usually little available to this type of resident, it followed that the amount of positive reinforcement might have to be increased greatly. One way of accomplishing this is to provide reinforcers non-contingently and almost continuously as long as no aggressive responses occur. Such a procedure might result in a rapid reduction in aggressive behavior by (1) keeping the subject so occupied consuming reinforcers that there would be little time for aggressive responses, (2) increasing the effectiveness of the punishing stimulus, timeout from positive reinforcement, and (3) providing the reinforcers that previously maintained the aggressive responses. The initial program was to allow the subject to be unrestrained only occasionally and for brief periods of time. During these brief periods, reinforcers were to be provided non-contingently and almost continuously. If an aggressive response did occur, it was to be punished by timeout from positive reinforcement (restraint).

The second objective was to make the reduction endure when the program was withdrawn. More specifically, the subject was to be unrestrained all day and all "extra reinforcement", *i.e.,* more scheduled reinforcement than provided other residents, was to be withdrawn. This objective seemed to necessitate that the subject learn behaviors that would obtain positive reinforcers and be incompatible with aggressive responses. For those reasons, the non-contingent and almost continuous staff reinforcement was to be made contingent upon responses that were incompatible with aggression and the amount of unrestrained time was to be increased gradually. Finally, all extra staff reinforcement was to be withdrawn and the resident was to be unrestrained all day. All changes were to be made by successive approximations, each change being dependent upon the subject's behavior.

METHOD

Subject

An 18-yr-old, 170-pound female who had been transferred from an institution for the

mentally retarded just one week before this study began, served as the subject. Her institutional files indicated a Stanford Binet IQ of 14 as well as several organic disorders including epilepsy, phenylketonuria, and no menstrual cycle. The subject was incontinent and completely non-verbal, but the immediate problem was her frequent and severe aggressive behaviors.

The first documented report of aggressive behavior came when the subject was 8 yr old. At this time, the State's Attorney requested hospitalization for the subject because her aggressive behaviors had been a serious home problem for several years. At 9 yr of age, she was admitted to an institution for the mentally retarded, where she remained until her transfer. On arrival at Anna State Hospital, she was restrained to a mattress by four sheets and was stuporous due to a heavy drug dose.

Throughout this study, the subject received Melleril 50 mg. and Haldol 2 mg twice per day. No other tranquilizing drugs were given to the subject.

Setting

The ward population consisted of 32 male and female residents from 18 to 65 yr old who were diagnosed as mentally retarded. The degree of retardation ranged from educable to custodial (Robinson and Robinson, 1965) with several residents also exhibiting psychotic responses. Some of the residents attended special education classes and some worked on the ward for credits that could be exchanged for food or clothing items at a ward commissary.

The major portion of the experiment took place in an 80 ft by 50 ft ward day room. An aide station, enclosed by a 4-ft high counter, was in one corner of the room. Directly across from the aide station was a television set and a row of chairs. A piano and a pool table were at the other end of the day room. Several chairs and tables were located along the walls of the room. The timeout chair in which the subject was restrained was in the center of the room facing the aide station and the television area. It was always in full view of the aides and the residents of the ward. Because the subject was incontinent, the solid seat of the chair had been replaced with nylon webbing which allowed urine to pass into a container under the chair.

Pre-experiment Observations and Procedures

During the subject's first week in the above setting, she was observed to choke other residents and aides, tear her own and other residents' clothing, disrobe, and attempt to pull heavy objects from tables. Because of her size and strength, the subject could and did overpower other residents and some staff members. The choking response was the most dangerous since it had resulted in physical injury and always produced a strong emotional response from the victim, who usually needed help to get free. In order to prevent the above responses, the subject was restrained in the timeout chair almost continuously, including meal time. Periodically, two staff members took her to the shower and, after she was cleaned, allowed her access to the day room. Even though other residents seemed to try to stay away from her, aggressive responses generally occurred within 10 min after she was released from the timeout chair. Immediately following such responses, the subject was returned to the chair and restrained in order to prevent additional aggressive responses.

Response Definition and Recording

The behaviors designated as aggressive were defined as follows:

(1) *Choke.* A choke was recorded when the subject held an aide or resident by the neck and squeezed (complete choke) or when the subject's hand reached the neck of an aide or resident but was knocked away before the subject could squeeze (attempted or partial choke).

(2) *Grab.* A grab was recorded when the subject held another patient by his clothing or hair and would not release him. In almost all cases, grabs at clothing were in the chest area.

Both responses were always preceded by a rapid movement of the subject's hands toward the person being attacked and both responses could occur quickly. Occasionally there were two responses before the subject could be reached and, in these cases, both responses were recorded, making it possible to have two aggressive responses per session.

After a response occurred, an aide or the experimenter (the first author) recorded the particular aggressive response, to whom it was directed, and the time at which it oc-

curred. These records, which also included the length of time the subject was unrestrained, were kept in the aide station. The aggressive responses were so obvious that a reliability check between the experimenter and the aides resulted in only one disagreement concerning either the occurrence or the naming of aggressive responses for 32 days (Sessions 64 to 96), during which time there were two daily, 2-hr reliability checks. There were four chokes and 40 grabs during the reliability checks.

Experimental Design

Since the program was to involve gradual changes in positive reinforcement and the amount of unrestrained time based upon the condition of the subject, several variables such as extra attention, the response requirements for attention, and the amount of unrestrained time were changed frequently and occasionally at the same time. However, it is possible to divide Exp. I and II into five phases that result in the alternation of the presence and absence of the extra "reinforcement" or attention from the staff. One phase, Phase III, involved the introduction of the timeout contingency for the grab response rather than a change to the presence or absence of extra attention. Only those procedures that were changed at the start or during a given phase are indicated in the description of the phases in the text. The five phases were divided into Exp. I and II to facilitate presentation of the procedures and their rationale: Exp. I consisted of the first four phases and Exp. II was the fifth phase.

EXPERIMENT I

Procedure

Phase I. Timeout for choke responses. Phase I was essentially the same as the pre-experiment procedures, the major difference being the recording of aggressive responses. Four times each day the subject was released from the timeout chair, showered, and allowed access to the day room for 30-45 min. These sessions were at 9:00 a.m., 11:00 a.m., 1:00 p.m., and 3:00 p.m. During each session, two to four staff members stayed within 10 to 20 ft of the subject in case a choking response occurred. The experimenter was usually a part of the staff that followed or observed the subject on the 8:00 a.m. to 4:00 p.m. shift weekdays. At the end of each session, or if a choking response occurred, the subject was returned as quickly as possible to the timeout chair and restrained until the next scheduled session. During this phase, all aggressive responses were recorded but only the choking response resulted in the subject being returned to the timeout chair. If the subject attempted to make other undesirable responses, such as tearing or removing her clothing, or pulling heavy objects from tables, the staff tried to stop her.

Because two aides had been injured by the subject, it was neither popular nor advisable to allow the subject to be released from restraint without some additional treatment procedure. For this reason, and because of the consistency of the pre-experimental observations and the data of Phase I, Phase I was limited to two days.

Phase II: extra attention. Upon being released from the timeout chair, the subject was followed closely (2 to 5 ft) by two to four staff members. The staff provided attention almost continuously, *i.e.*, every 10 to 20 sec, as long as there were no aggressive responses or other undesirable responses such as pulling objects from tables, lying on the floor, or undressing. Responses such as laughing, walking, and holding hands always resulted in attention but if these responses did not occur, attention was provided anyway. This extra attention, *i.e.*, more scheduled attention than provided for other residents, was in the form of food and social attention. Food consisted of candy, coke, sugared cereal, and potato chips. Social attention included holding hands, hugging, patting, smiling, verbal approval, and playing ball.

Both aggressive responses were recorded but only the choking response resulted in the subject being returned to the timeout chair before the session ended. If a grabbing response or some other undesirable response occurred, attention was discontinued, the response was stopped, and an incompatible response was provided. For example, if the subject grabbed another resident's clothing, her hand was removed from the clothing and placed on a ball. The response of holding the ball was followed by food and social attention.

On the seventh day of this phase, the attention that had been delivered non-contingently

and almost continuously was made contingent upon responses that (1) were incompatible with the aggressive responses and (2) seemed capable of producing some of the attention being provided by the staff. These incompatible responses ranged from relatively simple responses, such as laughing or drinking from a water fountain, to more difficult responses, such as the use of a credit card at the ward commissary or requesting attention by taking someone by the hand. Other incompatible behaviors included swinging outside, playing ball, rocking in a chair, combing her hair, and clapping hands to music.

About midway through this phase the number of sessions per day was increased from four to six by adding sessions at 7:00 a.m. and 7:00 p.m. Also, the number of staff that followed the subject was reduced to two.

Phase III. Timeout for grab and choke responses. Both grabbing and choking responses now resulted in timeout. Social attention was still provided for incompatible responses but food was discontinued except for the use of the credit card at the commissary.

About three-fourths (37 days) of the way through this phase, two more changes were made. First, the session duration was increased to the length of time the subject was awake each day, usually about 15 hr. If an aggressive response occurred, however, the previous session schedule was used to determine the duration of timeout. For example, if an aggressive response was made at 7:30 a.m., the subject remained in the timeout chair until the next scheduled session, in this case, 9:00 a.m. Regardless of when the aggressive response was made, the subject was kept in the timeout chair a minimum of 1 hr.

Second, attention was no longer provided for the incompatible responses because the staff no longer followed the subject around the day room. One aide was responsible for observing the subject from the aide station. The subject could get extra attention from the aides by requesting it. If the subject wanted attention from an aide, she had to go to an aide and request it by making noises or by taking the aide's arm. For example, if the subject wanted to be accompanied outside to swing, she had to go to an aide, take the aide by the hand, and proceed outdoors. Requests for attention were followed unless there was some other ward duty. However, it was always the case that the subject received attention at least once in the morning and once in the afternoon, *e.g.,* she was taken out to swing and play for 30 min in the morning and 30 min in the afternoon.

Phase IV: extra attention discontinued. In this phase, all of the remaining extra attention from the staff was discontinued; the subject was treated like any other resident. Requests for attention did result in smiles, positive comments, and occasional hand holding but the aides no longer went with the subject when requested. Activities such as group singing and trips outside occurred but only when these events were scheduled for the rest of the ward.

For the first 20 days of this phase, the subject was returned to the timeout chair only if she made a choking response or if two grabs were emitted within 5 min. Thereafter, being returned to the timeout chair was again contingent upon a single occurrence of a choke or a grab.

Results

Figure 1 shows the number of chokes and grabs per hour during the phases of both experiments. Experiment I includes only the first four phases and only the results from those phases are considered here. Chokes (lower graph) occurred at the rate of eight per hour during Phase I when timeout for choking was the only treatment. Choking responses were quickly reduced to about 0.20 per hour with the addition of the continuous extra attention at the start of Phase II. Choking responses then dropped to zero and, except for one five-day period, remained there until extra attention was completely stopped in Phase IV. During the middle and end of Phase IV, the rate of choking was still low and did not approach the level of Phase I, but it was consistently above zero.

Grabbing responses (upper graph) did not occur in Phase I: they appeared to increase during Phase II when the chokes were reduced. The chokes were reduced when the extra attention condition was added to the existing timeout condition. On the other hand, grabs were reduced when the timeout condition (Phase III) was added to the existing extra attention condition. Grabs were reduced from around 1.0 per hour at the end of Phase II, to about 0.5 per hour at the start of Phase III, and finally to the vicinity of 0.1 or fewer

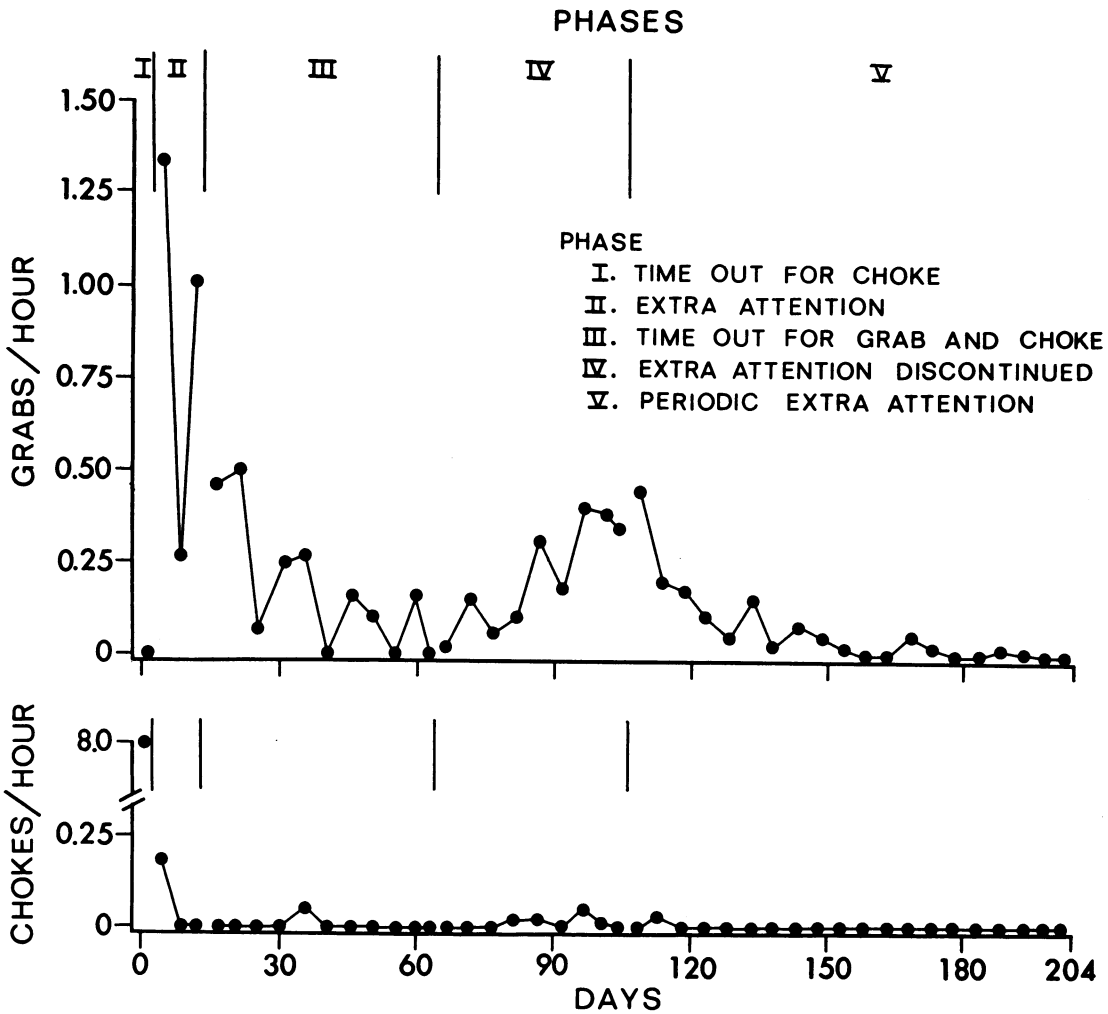

Fig. 1. Grabs (top graph) and chokes (lower graph) per hour for the five phases of Exp. I and II. Each point represents the mean for five days except when phases were not evenly divisible by five. In such cases, the extra days were included with the previous five days of that phase and this total was split into two points. The points in Phase I are the means for two days. The phases are indicated across the top of the figure and the days are indicated along the abscissa.

per hour at the end of Phase III. As with the chokes, grabs increased in Phase IV when extra attention was completely stopped. It can be seen that over Phase IV, grabs gradually increased to about 0.4 per hour.

Although the rate of aggressive responses was still reduced at the end of Phase IV, as contrasted to the start of the experiment, this does not necessarily mean that the program was a practical success. Most staff members were more concerned with the number of aggressive responses per day than the rate of the responses. Simply, it was good that the subject was up longer each day, but some staff members were more concerned with the absolute number of attacks the subject made each day. Figure 2 shows the number of chokes and grabs per day and the number of unrestrained hours per day for the five phases of Exp. I and II. Again, only the four phases of Exp. I are considered here. It can be seen that the amount of unrestrained time increased from about 30 min per day in Phase I to 11 to 14 hr per day in Phases III and IV. Figure 2 also shows the initial reduction in both responses. Chokes were reduced from six per day in Phase I to fewer than one per day in Phase II. Only one choke occurred in the next 70 days.

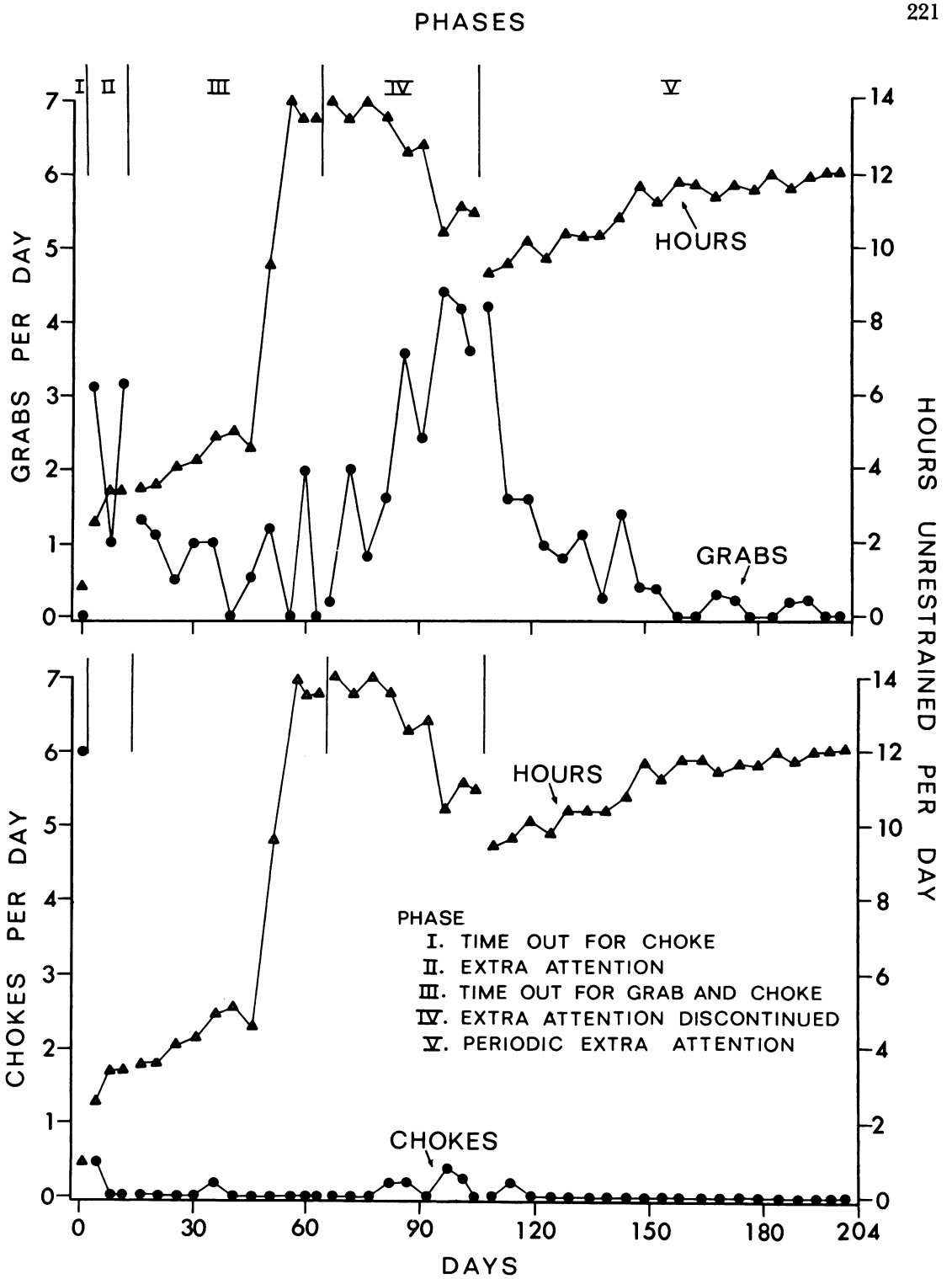

Fig. 2. Grabs (top graph) and chokes (lower graph) per day and the number of unrestrained hours per day for the five phases of Exp. I and II. The ordinate for chokes and grabs is on the left and the ordinate for unrestrained hours is on the right side. The unrestrained hours per day are indicated on both graphs. Each point represents the mean for five days except when phases were not evenly divisible by five. In such cases, the extra days were included with the previous five days of that phase and this total was split into two points. The points in Phase I are the means for two days. The phases are indicated across the top of the figure and the days are indicated along the abscissa.

Grabs were reduced from an average of about 2.5 per day in Phase II to an average of fewer than one per day in Phase III. Figure 2 also shows that the number of both responses per day increased in Phase IV. In fact, by the end of Phase IV there were four grabs per day, more than the initial level. Chokes did not return to their initial level, but by the end of Phase IV there was one choke every five days as contrasted to only one choke in the 51 days of Phase III.

Of all the aggressive responses in Exp. I, 174 were grabs and 21 were chokes.

Discussion

In Exp. I, the rate of each aggressive response decreased when extra attention procedures were in effect and the response resulted in timeout. The choking response was reduced first. The factors responsible for the increase in grabbing when choking decreased cannot be stated definitively but it was not surprising in view of the fact that the grabbing response was not punished and the fact that the grabbing response involved only a slight modification of the choking response. In this particular case, grabbing may have been an alternative, but unpunished response, maintained by the same sorts of conditions that maintained the choking response. At any rate, the grabbing response also decreased when the timeout contingency was added to the existing extra-attention procedures.

In Phase IV, however, when the extra attention was completely withdrawn, the rate of grabbing and, to a lesser extent, choking increased. The rate of both responses was still lower than earlier in the experiment, but the staff was more concerned with the absolute number of responses per day. The number of responses per day was not much lower than at the beginning of the experiment because the subject was unrestrained longer during Phase IV. In Phase IV, the staff and residents once again expressed fear of the subject and avoided her.

Since these increases in aggressive responses occurred when the extra attention was completely withdrawn, the withdrawal of attention may have been responsible for the increases. There are several ways in which the withdrawal of attention may have increased aggressive responses. First, it has been shown that the withdrawal of positive reinforcement can increase aggressive responses in animals (Azrin, Hutchinson, and Hake, 1966) and humans (Kelly and Hake, 1970). Second, some of the attention that had been discontinued may have been obtained by aggressive responses. Third, as a result of the withdrawal of attention when the subject was unrestrained, being put in the timeout chair may have resulted in a negligible reduction in attention. If this were the case, timeout would not be a very effective punishing stimulus. That this might be the case was suggested by the fact that the subject occasionally approached the timeout chair and indicated by gesture that she wanted to be restrained.

EXPERIMENT II

Experiment II attempted to increase the amount of attention given to the subject when she was unrestrained. A reintroduction of noncontingent and almost continuous attention did not seem necessary because both aggressive responses had been reduced to a low level in Phase III when the extra attention was partially withdrawn. Nor did it appear promising to increase attention by teaching additional incompatible responses; the subject did not appear capable of learning many more incompatible responses very quickly. Rather, the level of attention was increased by occasionally providing attention non-contingently when the subject was unrestrained. An increase in attention was expected to reduce aggressive responses by (1) reducing the conditions for extinction-induced aggression, (2) providing the attention that may have been maintaining aggressive responses, and (3) increasing the effectiveness of the punishing stimulus. In an attempt to increase further the effectiveness of the punishing stimulus, the possibility for attention during the timeout was reduced.

Procedure

Phase V: periodic extra attention. There was no time lapse between Exp. I and II: Phase V began immediately after Phase IV of Exp. I. Except for the following changes, the procedure of Phase V was the same as in Phase IV. Social attention was increased in the following way. When a timer sounded, the subject went to the aide station, got a credit card, and went with an aide to a music room

that contained a record player and several rocking chairs. The subject then gave her credit card to the aide who, every second session then gave the subject a cookie. The subject was then seated in a rocker and was allowed to listen to two records, each lasting about 3 min. During this time, the aide interacted with the subject by holding her hands, talking to her, tickling her, helping her clap her hands to the music, and trying to get her to dance. The timer that indicated these periods of social attention was set to sound every 30 min that the subject was unrestrained. The timer was not set if it would sound near mealtime or during some other ward activity such as parties, group singing, *etc.* After six weeks, the sessions of social attention were scheduled every 60 min and the number of cookies was reduced to one per day.

To reduce social attention while the subject was in the timeout chair, a 6-ft high divider was positioned around the front and two sides of the timeout chair. This divider prevented the subject from observing the television area and the aide station while in the timeout chair. The timer could sound while the subject was in the timeout chair but she was not taken to the social attention sessions at these times.

Since the subject had not learned many incompatible responses during Exp. I, certainly not enough to keep her occupied all day, the amount of unrestrained time possible each day was limited to about 12 hr. This was done by restraining the subject in another chair while she ate and keeping her restrained there for 1 hr after each meal. This chair was centrally located where the subject could see the staff, other residents, and the television. The subject sometimes requested, by gesture or by sitting in the chair, to be restrained at non-scheduled times. Although her requests were not acted on, the subject occasionally did sit in this chair at non-scheduled times. The timer for social attention sessions was not set when the subject was restrained in this chair.

Results

Examination of the results of Phase V in Fig. 1 and 2 reveals that for both responses there was a reduction in the number per day (Fig. 2) as well as in the rate (Fig. 1). Chokes were immediately reduced to a near-zero level and stayed there: only one choke occurred in the entire phase. The reduction in the grabbing response was actually more rapid than is indicated by the figures, which show a slight increase for the first five days of Phase V. During the first two days there were five and nine grabs per day respectively. This initial increase may have been due to the divider that restricted the subject's view from the timeout chair. The subject initially appeared upset while in the timeout chair and frequently made another aggressive response soon after being released. These two days were followed by a reduction in grabbing responses. The reduction was substantial and appeared to be enduring. For the last eight weeks of Phase V, the subject was unrestrained an average of 12 hr per day and during this time averaged fewer than one aggressive response every six days. During the end of Phase IV, on the other hand, the subject was also unrestrained about 12 hr per day but averaged about four aggressive responses per day.

There were 72 aggressive responses in Phase V and only one of these was a choke.

For the first six weeks of Phase V, there was an average of eight periods of social attention per day, each lasting about 7 min. When the time between these periods of social attention was increased, the subject averaged about five per day with each lasting about 7 min.

GENERAL DISCUSSION

As pointed out in the introduction, the use of a combination of procedures is frequently advantageous in solving applied problems, but that approach does produce difficulties in isolating the effects of a given variable. In addition, in the present study, variables such as unrestrained time and extra attention from the staff were modified frequently, sometimes during a phase in order to keep the treatment program appropriate to the condition of the subject. The present results do, however, suggest that the extra attention from the staff was necessary for the effectiveness of this program. For example, the choking response decreased abruptly when the extra attention procedures were added to the existing timeout contingency. Choking was observed only once in the next 70 days and reoccurred only when the extra attention was completely withdrawn in Phase IV. Choking was again reduced to zero

in Phase V when extra attention was increased through the periodic extra-attention sessions. Also, the grabbing response was reduced under conditions of timeout plus extra attention. In the case of the grabbing response, however, the extra attention procedures were already in effect and the timeout contingency was added (Phase III), thereby providing some evidence that the timeout contingency was also necessary. As with the choking response, the grabbing response increased when all extra attention was withdrawn in Phase IV and decreased again when extra attention was provided in Phase V. The program was effective in controlling the aggressive responses when extra attention from the staff was provided, but not when it was completely withdrawn. Assuming that the various types of attention in this study were positive reinforcers, the present results suggest that the positive reinforcement procedures, such as timeout, were not effective with the severely retarded subject unless there was an increase in positive reinforcement. In our opinion, for severely retarded residents, positive reinforcers are frequently scarce and they may have to be increased by the staff to increase the likelihood of success of treatment programs, such as the present one, that are based upon positive reinforcement procedures.

The program was intended to provide a practical solution to the control of dangerously aggressive behavior in a severely retarded resident and there are several indications that it did. First, the reductions *per se* had several features of practical value such as (1) aggressive behaviors were reduced quickly, (2) aggressive behaviors were reduced to a manageable level, (3) reductions endured when the program was largely withdrawn, and (4) the reductions occurred in the normal ward setting and over a normal 12-hr day.

Second, the program may be of practical value because it involves only positive reinforcement procedures. That is, the program may be an alternative for those who prefer not to use procedures involving aversive stimuli. The program did involve a punishment procedure, but the punishing stimulus was intended to be a reduction in positive reinforcement, rather than the presentation of aversive stimuli.

Third, the program seemed to be practical in terms of the response requirements for the subject. There was an attempt to keep the response requirements adjusted to the subject's condition. Initially, the response requirements were minimal; the subject was unrestrained for only brief periods and attention in the forms of hugs, smiles, candy, *etc.*, was provided almost continuously with little or no response requirement. As aggressive responses decreased, the response requirements were increased; the subject was unrestrained longer and attention was made contingent upon specific responses. The complete withdrawal of all extra attention when the subject was unrestrained almost all day (Phase IV) may have been unrealistic for this type of resident. The subject did not seem capable of learning enough incompatible responses to replace the attention previously provided by the staff. The partial reversal of Phase IV may have been prevented by fading the extra attention to the periodic extra attention of Phase V instead of the complete withdrawal of extra attention.

It is more difficult to determine whether or not the response requirements placed upon the staff were practical. The staff members did complain about the program. The most common complaints were that too much time was being spent with one resident and that the staff could not modify the program. The subject's improvement also presented a problem. Since the subject was unrestrained almost all day and was making few aggressive responses, some of the staff felt that the program could be discontinued, and it was discontinued at the end of Phase V. On the other hand, the program appeared to have some practical aspects. For example, the initial response requirements for the staff were large, but this lasted for only a brief time. The staff requirements were gradually reduced so that by Phase III only one person at a time observed the subject, and this was usually done from the aide station. The extra attention sessions of Phase V required only one staff member for 7 min about every 60 min. These sessions were also rotated among all the aides to spread the responsibility for the subject's care to all staff. Perhaps the most important evidence on this point is that the experimenters, who were only consultants to this ward rather than regular staff supervisors, were able to maintain the program for the seven months reported here.

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