*EVALUATING STRATEGIES TO IMPROVE CAREPROVIDER
PERFORMANCE ON HEALTH AND DEVELOPMENTAL
TASKS IN AN INFANT CARE FACILITY*

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Responding to administrative staff and parental concerns, using modified reversal and withdrawal designs, two experiments evaluated a staff-managed feedback system to improve the hygiene and developmental skills of children in an infant/toddler center. Experiment 1 examined feedback designed to increase staff performance in checking and changing diapers, and recording those changes. A chart plus supervisory feedback produced increases in and maintenance of staff performance. Experiment 2 compared an existing staff management system with a "playchart" plus feedback in increasing careprovider-infant stimulation. The data (with follow-up on a new staff) supported the use of the new feedback system. Questionnaire data further supported the utility of the playchart system.

DESCRIPTORS: infant centers, staff management, public posting, hygiene and developmental tasks

The infant day-care center provides a special set of staff management problems. Careproviders must maintain a safe environment, attend to nutritional and hygienic matters, and encourage parental involvement. In addition, there is the very important task of providing enriching stimulation. Yet, a concern is that staff spend most of their time in housekeeping duties and in the preparation of food and other materials. If these tasks can be done efficiently, more time can be allotted to developmental activities with the babies. However, careful monitoring of developmental activities between careproviders and children can be more difficult than monitoring more mundane tasks such as changing diapers.

Applied behavior analysts have recently fo-

cused on staff behavior. Careful management of staff duties often is the first step in providing educational, developmental, habilitative, and rehabilitative services (Lutzker, Martin, & Rice, 1981). There exists a relative paucity of research of management systems in infant care facilities. A notable exception, however, has been the work of the Living Environment Research Group at the University of Kansas. Several studies by this group resulted in a book detailing a structured environment for babies (Herbert-Jackson, O'Brien, Porterfield, & Risley, 1977). The procedures suggested in the book are based on research (e.g., Twardosz, Cataldo, & Risley, 1974) showing that a structured environment is important, and that staff management and organization is the key to a structured environment.

Despite the relative lack of research on staff management in infant centers per se, a comparative abundance of research exists in staff management in general. One of the most effective staff management techniques reported has been

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in the use of various forms of feedback. It has been used to reinforce the performance of resident training programs by the staff of a psychiatric setting (Panyan, Boozer, & Morris, 1970), to increase the staff-resident activities in a mental health institute (Quilitch, 1975), and to increase successful ambulation and range of motion skills in multiply handicapped clients by providing the feedback to staff contingent on client gains (Greene, Willis, Levy, & Bailey, 1978). In one comparative analysis, individual feedback was demonstrated to be more effective than group feedback (Emmert, 1978). A seldom addressed issue with the use of feedback, however, is how well it maintains performance over time (McRae & Lutzker, 1982).

An alternate to feedback (consequent control) as a staff management technique is antecedent control in the form of memos, public posting of responsibilities (Quilitch, 1975), or the specification of policies (Andrasik, McNamara, & Abbott, 1978). Finally, antecedent and consequent control procedures can be combined and compared in staff management research.

The experiments described here were the result of three areas of concern of the administrative staff of an infant care center. Parents had expressed their concerns to supervisors as to the frequency that their babies' diapers were being changed. The supervisory staff interpreted this concern as a two-fold problem: the need for careful monitoring and performance of this health-related responsibility, and the need to provide data-based communication to parents. Also, the administrative staff was interested in increasing the frequency of careprovider-infant stimulation activities. Thus, Experiment 1 was conducted in order to compare antecedent to antecedent plus consequent control in increasing staff performance of diaper checks and changes, and the staff's frequency of recording those changes in order to provide data-based communication to parents. Experiment 2 was conducted in order to use a similar system from the previous experiment to increase the frequency of care provider-infant stimulation activities. Further,

the effects of the system were formally followed up with a new staff after several months and informally followed up over more than 2 yr.

EXPERIMENT 1

METHOD

Participants

Thirteen women (ages 19-62 yr), who comprised the staff of an infant day-care center in the Child and Family Program of the Division of Human Development at Southern Illinois University at Carbondale, participated in this experiment. Two were CETA trainees, eight were undergraduate students and three were graduate students. Usual staffing patterns had two caregivers and a supervisor. The summer session staff were three undergraduate females (ages 20-22 yr). Seven children attended the morning and afternoon session, Monday through Friday. Their ages were 2-21 mo, mean = 11.5 mo. No child was toilet trained.

Setting and Materials

The study was conducted in a large room (7.4 m $\times$ 5.6 m) at the center. Half the floor space was used as a play area with the remaining space used for eating, sleeping, and diapering. One wall bordering the play area had a one-way mirror allowing for observations. Entrance to the observation room was from an outside hall, thus preventing observers from being seen by anyone in the infant center. Children were provided with meals, bottle feedings, hygiene maintenance (e.g., diaper changes), and indoor and outdoor activities on a scheduled, but not structured, basis.

The diaper chart was a 72.9 cm $\times$ 57.2 cm piece of poster board that was covered by a clear, thin plastic laminating sheet. A felt pen was attached to the chart.

Design and Response Definitions

An ABAC (plus modified follow-up) design was used to evaluate the effects of public charting, and public charting plus feedback on staff

performance. The staff behavior under investigation was (a) checking and changing diapers and (b) recording the checking and changing.

Diaper check. A diaper check was scored when a caregiver put her hand or finger in a child's pants or diaper, felt the diaper close to the crotch or peered down the back of the diaper, but did not remove the diaper.

Diaper change. A diaper change was scored when a child was placed on the changing table, and the old diaper removed and replaced with a clean diaper.

Recording diaper checks/changes. Recording of checks and changes were scored when a caregiver marked the event on the child's daily log sheet (during baseline) or on the feedback chart (during treatment). There was a 3-min limit, timed from either completion of the check or from the time the child left the changingtable. This limit was used because the probability of making the recording response dropped greatly after this time and because longer time intervals complicated data collection.

Observations

Observations began by noting the names of caregivers present. Observations occurred for the same 1-h period during each morning and afternoon session. This h was divided into 1-min intervals with the aid of a tape-recorded signal. Observers scored the occurrence of diaper checks or changes and whether or not the caregivers recorded those events. For each recorded event, the child and staff names were noted. Data were not collected during the one session when fewer than three children were present. Observers were the first author and graduate students in the Behavior Modification Program at Southern Illinois University. Observers were trained until they could recite the names of all children and caregivers, and could reach competency through written tests and sample master videotapes with the observational system. Staff were unaware that they were being observed. One-minute intervals allowed for the most functional calculation of the reliability data.

Reliability

Eight reliability checks were taken at least once in each phase. Reliability observations occurred by having a second observer independently record responses. Reliability was computed by dividing occurrence agreement by occurrence agreement plus occurrence disagreement. Reliability for checks and changes ranged from 75% to 100%, mean = 93%, and for recording of the checks and changes ranged from 70% to 100%, mean = 86%. Separate reliability for checks and changes was not calculated because these responsibilities were scored and plotted together.

Baseline (A) (five sessions)

Prior to the baseline condition, supervisors requested that caregivers increase their diaper checking and changing as well as recording of the checks and changes on the child's daily log. Based on recommendations by Herbert-Jackson et al. (1977), the staff was encouraged to check and/or change diapers at least once every hour.

Diaper Chart Conditions (B) (six sessions)

The chart was hung on the wall near the changing area. The chart was explained and the staff was instructed to (a) check the chart regularly and to check or change the child each hour and (b) find the appropriate box (time interval) on the chart under the child's name and mark initials and a "+" for BM, "-" for wet only, or "o" for a dry check, after the child had been returned to the play area.

Baseline (A) (six sessions)

The chart was removed, and careproviders were told that they had been doing well and were asked to continue to check and/or change each child at least once per hour and to mark this on the child's daily log.

Chart Plus Feedback (C) (eight sessions)

The chart was reinstated and each caregiver was given a letter from the center director restat-

ing the diaper chart directions and describing the additional feedback system. (The use of director memos was a standard protocol.) This feedback was given on a random schedule and consisted of personally addressed notes from the supervisors pinned to the bulletin board outside the center.

Maintenance and Modified Follow-Up

These data were collected to determine if new staff members working during the center's summer term (operated with only one session per day) were using the chart and maintaining the diapering behavior. These data were collected 4.5 mo after the last observation sessions with the previous staff members.

RESULTS

During the first baseline condition the range of diaper checks and changes was 70% to 100%; mean = 88.6 (Figure 1). It is evident,

however, that the staff's performance on this task was unstable. The percent occurrence of recording checks and changes was 50.5% (range = 30-80%). The administrative staff expressed displeasure with care staff variability in completion of these duties.

During the chart condition, checks and changes remained about the same (range = 50-100%; $\bar{x}$ = 86), while recording improved dramatically (range = 90-100%; $\bar{x}$ = 97.1%). When the chart was removed, the percent occurrence of checks and changes, and recording dropped. The mean for checks and changes for that condition was 77.6%, and 47% for recording. Many complaints were registered by the caregivers, saying that they had come to depend on the chart and desired its return. The chart plus feedback condition produced 100% performance by the staff on checks and changes, and a mean of 87% for recording. Finally, during the modified follow-up condition, using the

Fig. 1. The percentage of goal responses. Closed circles connected by solid lines indicate completion by care-provider staff of diaper checks and changes. Open circles connected by slashed lines indicate the completion by staff of recording diaper checks and changes.

chart alone, the mean for checks and changes was 94%, and 91.6% for recording.

EXPERIMENT 2

METHOD

Participants

Twelve females (age range, 20-29 yr), comprising the entire caregiving staff of an infant care center at the time, participated in this experiment. Ten were undergraduate students in the Child and Family Program. Two caregivers were from outside the program, but had previous child care experience. Three had worked in the Center during the previous semester and had participated in Experiment 1. Morning and afternoon supervisors (primary caregivers) provided guidance and supervision for the staff of the center. These individuals collected some of the data in Experiment 2, and therefore did not participate.

Seven children participated in each of the morning and afternoon sessions at the center. At the beginning of the study, their age range was from 4 to 19 mo (mean = 11 mo) for the morning, and 6 wk to 18 mo (mean = 7.5 mo) for the afternoon. None of the children had any physical or developmental disabilities. One child from the morning and afternoon sessions withdrew from the center during the study.

Materials

The play and feedback charts used during treatment phases of the study were constructed of double weight poster board. Felt markers were used to delineate sections of the charts, and clear plastic self-sticking lamination sheets were used for their surfaces. The play chart was cut into 14 individual modules, one for each child. Each module measured 23.8 cm $\times$ 30.2 cm in size. This arrangement occupied 98 cm $\times$ 68 cm for a group of seven modules. A second group of seven modules was adjacent to the first and occupied the same amount of space. The chart was located on both doors of a large closet and within clear view of the play area. Eighty differ-

ent play activities were printed separately on 10.2 $\times$ 15.4 cm file cards. Examples of play activities included finding bright objects, exercises, toy hiding, and so on. Four different colors of cards were used to separate the activities into categories by ages of children. The feedback chart measured 23.8 $\times$ 60 cm and was located on the inside main door of the center.

Observational Sessions

Observations were conducted from within the center throughout each of the 4-h morning and afternoon sessions, 5 days per week. The morning sessions at the center began at 8:00 a.m. and concluded at 12:00 noon. The afternoon sessions began at 1:00 p.m. and concluded at 5:00 p.m.

Experimental Design

The design of the study was an ABCDC. The baseline phase (A) was used to measure frequency of play under existing conditions. The second phase (B) was an informational-request phase in which the activity cards were placed in the center. Also included here was a request by the assistant director to caregivers to devote more time to play activities with the children. During the treatment phase (C), the play and feedback charts were instituted preceded by a detailed explanation of how they were to be used. Withdrawal phase (D) was marked by the removal of both charts and the provision of an alternate set of activities (with which the caregivers were familiar) previously used in the center. These activities were similar to those listed on the play cards, except that many of these activities were worded in more general terms, and were listed on sheets with corresponding spaces for recording their use. Caregivers were allowed to choose which of the 86 or more activities they would use. These sheets were located on the counter bordering the play area. Portions of the sheets that did not describe interactions between caregivers and children were excluded. These sheets were included as means of evaluating a system of play and caregivers' attention to recording play that had pre-

viously been used. The final phase (C) involved reinstating the play and feedback charts. A modified follow-up occurred during the summer. The staff were new, but the children were the same. The center operated only one session per day. Data were collected during this session in order to evaluate maintenance of the play chart and feedback condition over time.

Dependent Measures, Response Recording, and Reliability

The principal dependent measure, stimulation-play, was defined as any obvious physical interactions between child and caregiver during which the caregiver was: (a) within arms length of the child, and (b) facing the child or some portion of, or (c) facing a common object. Play was not scored when the interaction involved one or more of the following conditions: (a) any instance of feeding or children eating, (b) whenever a child was located on the diapering table with pants down, (c) a child being carried from point "A" to point "B," or (d) a child within a crib or visibly asleep. Data were not collected during the five sessions when only three or fewer children were present, fewer than two caregivers were present, and/or the observers were not available to collect data.

Pla-checks (Quilitch, 1975) were conducted by having primary caregivers (the primary observers) make a rapid visual sweep of the center from left to right and note all children available for play. Immediately following this, a second sweep was made in which all children involved in play with caregivers were noted. These observations provided a percentage of children involved in play with staff.

Pla-checks were made on a predetermined randomly assigned schedule, averaging twice an hour with a total of eight checks per session. A belt buzzer (Enduro Memo Time, Model #120 mm BB, The Enduro Time Co., New York), not audible to other staff members, signaled the observers when it was time for pla-checks. After each check was made, the figures were recorded on a small card which also contained the next

duration of time for which the buzzer was to be set.

Data assessing the discrete number of play activities conducted (as listed on the play cards) are not presented because the extreme variability in the manner of play, and because interpretation of the play activities precluded the use of a reliable system by which to measure these data. Since the activity cards were to serve only as a basic description of the play activities and children's attention to the activities, such data would prove to be an inadequate measure of the amount of play.

Reliability data were collected according to a procedure detailed by Quilitch (1975) in which a second observer stood next to the first and took a silent, independent check simultaneously. During the afternoon, reliability checks occurred at least twice per phase except for the first baseline phase. In the morning sessions, 10 reliability checks were taken at least twice per phase. In both morning and afternoon sessions complete agreement was achieved on all but one of the checks, yielding 90% total agreement for the morning and 88% total agreement for the afternoon. Supervisors were used as observers because they caused little intrusion into the natural environment. Communication (feedback) from supervisors to staff was carefully monitored and controlled by the senior author who also regularly observed the supervisors from the observation roof in order to ensure their completion of the observation tasks. The primary caregivers received frequent encouragement for their diligence in data collection.

Selection and Validation of Play Activities

The 80 play activities that were selected for use in this study were validated on the basis of the following criteria: (a) The resource person used to describe the activity was to have had a known involvement with play-related research and/or expertise in the area of play, (b) the activities were described in enough detail to allow for transcription into clear caregiver and children behaviors, and (c) the activities in-

volved toys and other simple materials in supply at the center.

At the request of the administrative staff, the play activities were arranged in an order approximating the developmental norms of children by chronological age. This was accomplished by: (a) reference to the activity's source when possible, (b) reference to the developmental sequence found on the Denver Developmental Test, and (c) a final review by the center's assistant director. The age for which the activity was most appropriate was then recorded on the back of each card.

The cards were divided into two components. The first described in simple terms how the activity was to be conducted by the caregivers, and the second portion described what kind of behaviors to look for from the child. For example, the activity entitled "Baby Exercises" stated, "Place child on his/her back on floor. Move feet bicycle style and move arms out and back." The second portion asked, "Does your child wave his/her arms and kick their feet?" Three copies of all cards were provided.

Play Chart

Assignment and changing of play activities. During the first day that the play chart was placed in the center, primary caregivers selected three activities for each child. This selection was based on the children's recent evaluations using the Denver Development Test. All subsequent selections of activities were to progress forward in the developmentally ordered sequence of activities, based on children's performance with previous cards. This ensured that staff were engaging in age-appropriate activities with the babies. Card changes were to occur once a week; however, following numerous caregiver suggestions that changes should occur more frequently, this was amended to every other day during the second week of use. Caregivers were also free to change activities more frequently if, with primary caregivers' concurrent, it was felt that a child was bored or frustrated with a given activity.

Recording play. Caregivers were free to terminate a particular instance of play when it was believed that the child was losing interest in that activity. This activity counted as one occasion of play providing that at least a single sequence of the activity was concluded as described by the activity card. Following termination of the activity, caregivers were to record this occurrence of play by placing their initials in the section of the chart adjacent to the completed activity. If a child was able to perform the goal response listed on the card, the initials for this occasion were to be circled. Compliance to this responsibility was high during treatment conditions.

Play instructions. Caregivers were encouraged to use activity cards as a starting point from which to expand their play. This emphasis on the imaginative use of the activities was stressed several times during the experiment with the hope of encouraging generalizations to other forms of play and to prevent repeated use of the activities from becoming boring.

Feedback chart. Those activities that had been recorded on the play chart were totaled and placed on the feedback chart that read, "Yesterday, the staff of the Infant Center conducted (e.g., 40) a.m., (e.g., 45) p.m. activities with our children. Thank you." Caregivers were informed that they would be able to monitor their use of the play activities by noticing the feedback chart at the end of each day or on the following day.

RESULTS

The data are presented as the percentage of children receiving play from the caregiving staff. Group data provide a clearer picture than individual staff data because of daily fluctuations of staff attendance. The grouped data, nonetheless, closely resemble individual staff data. Figure 2 depicts these data throughout all phases of the study for both morning and afternoon sessions. During baseline an ascending trend can be seen during the morning session with an average of 12% of the children receiving play interactions (range = 0-18%). The afternoon baseline phase reflects a descending trend, with an average of

Fig. 2. The percentage of children in play. Dark circles connected by solid lines show the performance of afternoon careproviders. Open circles connected by solid lines indicate the performance of the morning care-provider staff.

37.6% of the children receiving play in this phase (range = 30-45%). The informational-request phase made little impact on the percentages of children receiving play. Mean percentages for this phase are 5.6 (range = 0-13%) for the morning session and 25.2 (range = 9-43%) for the afternoon session.

A marked increase in the amount of play with children can be seen following the introduction of the play and feedback charts. For the morning session, an ascending trend in play is noted with a mean of 54.0% (range = 20-91%). The afternoon session also reflected an ascending trend in play with a mean of 48.2% (range = 29-69%).

Removal of the charts produced a descending trend in play during both sessions. Substitution of the old activity sheets did little to alter this trend, with a drop in the percentages of children receiving play to a mean of 26.4% (range = 13-50%) for the morning and 37.5% (range = 17-66%) for the afternoon session.

Reinstitution of the play and feedback charts resulted in a sharp increase in the percentages of children receiving play. Morning play climbed

to a mean of 59.5% (range = 46-81%). Follow-up data taken with staff members indicated that children continued to receive a high level of play. During this session children receiving play averaged 55% with a range of from 29 to 100%.

These results indicate the percentages of children receiving play increased during those phases in which the charts and feedback were in use and decreased to near baseline levels when these events were withdrawn. Thus, neither historical nor maturational variables could have accounted for these changes.

Questionnaire Data

During the final week of the study, a questionnaire intended to assess parent and caregiver responses to the play chart was distributed to parents of children and caregivers. Participants were instructed to remain anonymous. Responses were scored along a 6-point Lickert-type scale. Since this questionnaire was distributed during the final week of the school semester, some individuals were unavailable for comment. Of the 12 parents and 12 caregivers, seven each (58%)

Table 1
Mean Responses to Parent Questionnaire

	<i>Anchors</i>	<i>Response</i>
1. It is _____ that my child receives stimulating sorts of play while in the center.	1—not important 6—very important	5.0
2. I have noticed _____ in the number of stimulating activities listed on my child's daily log.	1—no change 6—a big increase	4.3
3. This information is _____ to me.	1—not important 6—very important	5.2
4. I feel that the play chart is _____.	1—not worth keeping 6—worth keeping	5.0
5. I have _____ noticed my child playing the same activities while home, as taught them in the center.	1—never 6—frequently	4.8
6. I _____ attempt to carry on at home some version of the types of play listed on my child's daily log.	1—never 6—frequently	4.7
7. If I had more detailed explanations of the play activities I would _____ conduct them at home too.	1—never 6—frequently	4.5
8. I have observed _____ in the amount of time staff play with children in the center.	1—a decrease 6—an increase	4.8

responded to the questionnaire. Tables 1 and 2 show the responses to the questionnaires. The entire cost of materials for both experiments was \$22.

DISCUSSION

Experiment 1 demonstrated that a chart alone (an antecedent event) and a chart plus feedback

Table 2
Mean Responses to Caregiver Questionnaire

	<i>Anchors</i>	<i>Response</i>
1. I believe that stimulation play is _____ to the development of the children in the center.	1—not important 6—very important	5.8
2. The play chart was _____ in aiding me to interact with the children more.	1—no help 6—a big help	3.7
3. The play chart helped me _____ to keep better records of the stimulation activities.	1—not at all 6—a great deal	4.7
4. I have noticed _____ in the other caregivers' attention to play as a result of the play chart.	1—no change 6—a big change	4.8
5. I believe the play chart is _____.	1—not worth keeping 6—worth keeping	4.7
6. Without the play chart I believe that the caregivers would spend _____ time with the children.	1—less 6—more	3.0
7. I believe the play chart helped me keep _____ track of which children had and hadn't received play.	1—worse 6—better	5.4
8. I have noticed _____ changes in the children's behavior as a result of the stimulation activities.	1—no change 6—a big change	4.0
9. I would like to see my own children participate in a program using such an activity chart.	1—not at all 6—a great deal	4.7
10. These kinds of activities can be considered stimulation play.	1—not at all 6—definitely	5.0

(antecedent and consequence) increased staff performance in diaper checking and changing (hygiene) and recording (communication to supervisors and parents). The chart alone appeared to be more effective than the chart plus feedback.

It might be argued that using the senior author as an observer is problematic. However, the reliability data suggest that he was an accurate observer. Further, he had no vested interest in the outcome of the evaluation of the staff management strategies.

It is only for speculation as to why "recording" was less effective in the chart plus feedback condition than in the chart condition alone. However, examination of the data in the return to baseline condition shows the occurrences of recording dropping below the original baseline rates, thus it is conceivable that it was simply taking longer to recover the effects of treatment.

Parents and staff alike indicated that they felt that the collecting and recording of data was at once an important tool in improving infant hygiene and in communicating the infant's daily care to the parents. Also of interest is the descending trend in baseline. It should be remembered that prior to baseline, staff were asked by supervisors to try to attend more to checking, changing, and recording. It appears that this verbal request had a transient positive effect.

The success of the first experiment provided encouragement to the administrative staff that simple antecedent and consequent events could be arranged to provide a more carefully monitored, healthful environment for the children. Thus, Experiment 2 was conducted the following semester to determine if similar strategies would be effective in promoting developmental activities between the careproviders and the infants. The results of Experiment 2 suggest that a play chart and feedback were quite effective in increasing careprovider-infant play. Follow-up with a new staff showed maintenance of the results. The play and feedback charts increased the frequency of play and interactions between the caregivers and children.

A weakness in this study was the manner in which stimulation-play was defined. The emphasis was primarily on the close proximity of caregiver to child and involving all interactions, excluding feeding, carrying, and diapering. A potential for this definition to be sensitive to nonstimulation-play types of interactions, therefore, would seem plausible. Although play in the common sense involves complex interactions between child and adult, the interactions as defined here at the very least fulfill the intent of providing adult-child stimulation. Support for the use of proximity-based definitions of play can be found in past research (Rubenstein & Howas, 1979; Twardoz & Sajwaj, 1972; Zegib & Forehand, 1978).

Further support for the use of this definition came from the caregivers themselves. The questionnaire data indicated that caregivers maintained that their interactions within the described definition were of a stimulation-play nature.

The results of these two experiments indicate that caregiving staff may use the self-charted information as a means of improving their job performance. The feedback supplied by the play chart specified progress toward the goal response (increased play with children) by individual caregivers.

Prior to this intervention in the infant center, a number of procedures attempted to increase caregivers' attention to their important duties. These included lectures, film presentations, and numerous supervisory and administrative requests. Baseline data reflect the ineffectiveness of these procedures. Primary caregivers reported frustration in their inability to reverse this trend, and noted a general idleness and boredom on the part of the caregivers as well as the children. The use of these systems provides a technology for maintaining play and diapering duties without daily instructions and costly training programs. Further, these systems were maintained without costly outside collection of data used for feedback. In fact, these systems have continued to operate for almost three years. Unfortunately,

time prevented a separate analysis of the feedback components alone in these experiments. It is encouraging that antecedent events alone can be used to produce staff behavior change. It is also of interest that group feedback was useful in Experiment 1 and individual feedback was part of the treatment effectiveness in Experiment 2.

The present system was designed to meet the needs of an infant care facility and the special requirements that come with children whose behavioral repertoires are in an early stage of development and therefore limited. Thus, feedback systems may play an increasingly important role in serving the needs of groups that are unable to generate their own feedback. This is particularly important considering that play, as well as other requirements of infant care, must frequently compete with duties that are much easier to monitor.

Further research should concentrate on separate treatment component analyses, formal long-term follow-up data collection, and a more "fine-grained" content validation of stimulation-play response definitions.

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