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THE EFFECT OF VERBAL AND GRAPHIC FEEDBACK ON
DIRECT CARE TRAINERS' DATA-RECORDING BEHAVIOR

THESIS

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By

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This study investigated the effects of verbal and graphic feedback alone and in combination with praise on the data-recording behavior of 12 direct care trainers (DCTs) who recorded their reinforcer deliveries as they interacted with mentally retarded clients. An additional variable examined was the effect of time of delivering feedback on subsequent data-recording behavior. Feedback was delivered by the experimenter. Correspondence checks were conducted and a three-phase multiple condition experimental design was used. All feedback conditions produced an observable difference in DCT data-recording behavior. Time of delivery of feedback also appeared to have an effect on the amount of data recorded by DCTs.

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INTRODUCTION

The behavior of persons living and working in institutions for the mentally retarded, including direct care trainers (DCTs), has become the focus of increasing public interest (Iwata, Bailey, Brown, Foshee & Alpern, 1976). Interest in the behavior of institutional staff, per se, grew out of regulations focusing on client care from such agencies as federal regulatory groups and private accrediting agencies (Accreditation Council on Disabilities (ACD), 1990) monitoring facilities for the mentally retarded. Coinciding with this growing interest by regulatory and accrediting agencies, applied behavior analysts (Calpin, Edelstein & Redmon, 1988; Green & Reid, 1991; Ivancic, Reid, Iwata, Faw & Page, 1981; Iwata et al., 1976; Realon, Lewallen & Wheeler, 1983) also turned their attention to behavior occurring in institutional settings.

Initially, the focus was on the behavior of the client and devising programs that affected client behavior. Twardosz and Sajwaj (1972) used differential reinforcement to increase appropriate responses in a retarded boy. Trace, Cuvo, and Criswell (1977) designed a program to teach coin equivalence to mentally retarded adolescents. Berler, Gross and Drabman (1982) used coaching, modeling, behavior rehearsal and feedback to teach children the target behaviors of eye contact and appropriate verbal responses. Foxx, McMorrow and Mennemeier (1984) used feedback, self-monitoring and reinforcement procedures to increase vocational skills for moderately retarded adults.

Repp and Deitz (1979) reported that while the focus on the behavior of retarded persons continued, other studies began to shift their focus to the behavior of staff involved in training programs for the retarded. Gardner (1970) manipulated reinforcement to effect a change in work attendance. Pomerleau, Bobrove, and Smith (1973) utilized monetary awards to modify the DCT-client relationship. Burg, Reid, and Lattimore (1979) employed self-recording to increase interactions between DCTs and clients. Alavosius and Sulzer-Azaroff (1986) applied feedback to improve safety in transferring disabled clients. DeVries, Burnette, and Redmon (1991) and Babcock, Sulzer-Azaroff, Sanderson and Scibak (1992) implemented feedback to increase glove-wearing by infection-control nurses.

Despite the success of these interventions in modifying behavior, many institutional administrators found manipulating the environment to increase or maintain staff behavior (such as active participation with client, reporting to meetings on time, . completing required documentation on time) to be more difficult than arranging the environment to maintain appropriate resident behavior (Repp & Deitz, 1979). Another difficulty was the cost of staff training programs. For example, Iwata et al. (1976) suggested continuous monitoring as a way to increase staff performance; however, the maintaining contingencies specified in such interventions were often expensive in terms of supervisor time. So, investigators sought less costly alternative staff training procedures.

One answer to the concern of institutional administrators was provided by Fairbank and Prue (1982) who recommended performance feedback as a low cost, effective, easy-to-implement approach to changing staff performance. Prue and Fairbank (1981) defined performance feedback as information provided to individuals about the quantity or quality of their past performance. Reid, Parsons, and Green (1989) said, "In its purest form feedback entails no explicit approving or disapproving components, only a description of the work that occurred" (p. 94). The focus of most feedback studies has been on changing or maintaining staff work behavior to increase staff's effectiveness as care providers, to maintain safety, and to provide training in behavioral programs (Realon, Lewallen, & Wheeler, 1983). Sulzer-Azaroff and De Santamaria (1980) implemented a system using feedback to reduce occupational accidents at a factory. Calpin, Edelstein, and Redmon (1988) applied feedback to increase the amount of direct client contact by clinicians. Crowell, Anderson, Abel, and Sergio (1988) employed feedback to improve customer service offered by bank tellers. Fox, and Sulzer-Azaroff (1989) utilized feedback to train staff to safely evacuate clients during fire drills.

Prue and Fairbank (1981) and Balcazar, Hopkins, and Suarez (1986) identified six critical dimensions of feedback that provided impetus for behavior analytic research in this area. These six aspects of feedback included privacy, source, participant, content, delivery mechanism and frequency. Each of these will now be defined and discussed.

Feedback Privacy

Feedback privacy referred to whether feedback was delivered privately or publicly (Balcazar, Hopkins, & Suarez, 1986). Van Houten, Hill, and Parsons (1975) found that both public and private feedback yielded consistently positive effects. The staff training literature (Pommer & Streedbeck, 1974; Quilitch, 1975; Slavin, 1972) indicated that feedback could improve job performance. One way of providing feedback to staff was through public presentation of their job performance (e.g., feedback boards, graphs, news sheets). Public posting apparently functioned to accelerate desired staff performance. Panyan, Boozer, and Morris (1970) publicly posted feedback sheets to increase the percentage of training sessions conducted by staff in a state institution for retarded children. Kreitner, Reif, and Morris (1977) used feedback, via posted memos, to increase performance among mental health technicians.

Feedback Source

Feedback source referred to who or what presented the information to the performer (Prue & Fairbank, 1981). Balcazar, Hopkins, and Suarez (1986) and Van Houten, Hill, and Parson (1975) concurred that delivery of feedback by supervisors appeared to be more effective than feedback furnished by outside consultants. Kim and Hammer (1976) also reported that feedback delivered by a staff supervisor was more effective in changing staff behavior than when feedback was delivered by the experimenter. Prue and Fairbank (1981) disagreed and said that though it might appear that the greater the rank of the person delivering the feedback the greater the

effect of performance, this may not always hold true. Brown, Willis, and Reid (1981) required supervisors to deliver feedback to increase staff performance at an institution for the mentally retarded. Richman, Riordan, Reiss, Pyles and Bailey (1988) used self-monitoring to increase staff performance in a residential setting for the mentally retarded.

Feedback Participants

Feedback participants were defined as the subjects whose performance was described in the feedback (Balcazar, Hopkins & Suarez, 1986). In studies comparing effectiveness of individual versus group feedback, Welsch et al. (1973), Emmert (1978) and Shook, Johnson, and Uhlman (1978) reported that individual feedback was no more effective in modifying staff behavior than was group feedback. In a study comparing effects of group and individual feedback, Ivancic, Reid, Iwata, Faw and Page (1981) reported parallel effects in increasing staff-client interactions.

Feedback Content

Balcazar, Hopkins, and Suarez (1986) identified content of feedback as pertaining to the standard against which future performance was to be measured. Kreitner, Reif and Morris (1977) compared an individual's current performance with the standard set by that individual's immediately previous performance and found that bi-weekly feedback improved the person's performance.

Delivery Mechanism

Delivery mechanism referred to the type of device used to deliver feedback to the performer (Prue & Fairbank, 1981). Balcazar, Hopkins, and Suarez (1986) reported that most feedback interventions used verbal, written, or graphic data as feedback. Prue and Fairbank (1981) suggested that graphic information was much more efficient in changing staff performance than were other forms of feedback, although graphs required more effort to produce than verbal feedback. DeVries, Burnette, and Redmon (1991) and Babcock, Sulzer-Azaroff, Sanderson and Scibak (1992) used verbal and written feedback to increase wearing of gloves by infection-control nurses. Shook, Johnson, and Uhlman (1978) used graphic feedback as one variable to increase professional staffs' report writing.

Feedback Frequency

Feedback frequency referred to the schedule on which feedback data was to be delivered to the performer (Balcazar, Hopkins & Suarez, 1986; Prue & Fairbank, 1981). Pierce, Hanford, and Zimmerman (1972) reported that daily and weekly feedback were much more effective than monthly, although no great differences existed between daily and weekly feedback. Chokar and Wallin (1984) found biweekly feedback to be as productive as weekly feedback in changing staff performance.

In summary, feedback has many aspects. Feedback effectiveness depends on the arrangement in any design of these various six dimensions. However, feedback,

per se, is important because it has functioned as a consequence for establishing and maintaining staff performance in institutional settings.

In addition to delivering services that directly affect client welfare, institutional staff provide many other services. These services often fall under the heading of "administrative duties". There are many staff duties that have no immediate or readily apparent impact on client welfare in the human service field. Reid and Whitman (1983) pointed out that one of the more critical areas of staff responsibility which could have an important, although indirect, effect on client welfare is institutional paper work. Because external agencies monitor service delivery to clients in larger institutions, the only evaluative procedure to determine whether or not the institution is carrying out proscribed policies is to review day-to-day paper work.

Professional staff working in institutions for the retarded rely on daily reports of client behavior furnished by DCTs. According to Richman, Riordan, Reiss, Pyles, and Bailey (1988), the behavior of DCTs is critical to the day-to-day welfare of each client. While Glenn, Ellis, and Hutchinson (1993) described a prevailing situation in some institutions wherein the focus of the "behavior specialist" was on decelerating rates of inappropriate behavior, institutions for the retarded are now required to give evidence of procedures for increasing appropriate behavior (Accreditation Council on Disabilities (ACD) 1990 Standards 555-559). Thus, in addition to collecting data on problem behavior, DCT administrative duties have been expanded to include recording

delivery of reinforcers for appropriate behavior. To date, research examining ways to increase DCTs data-recording behavior is sparse.

Effect of Feedback on Data-Recording Behavior of Professional Staff

When investigating effects of feedback on increasing quantity and quality of paper work was the target of interest, research focused on behavior of professional staff (Egan, Luce & Hall, 1988; Lovett, Bosmajian, Frederiksen & Elder, 1983; Repp & Deitz, 1979). Shook, Johnson, and Uhlman (1978) used feedback in assessing effectiveness of different techniques to increase number of graphs maintained by professional staff members in a human service setting. Epstein and Wolf (1978) addressed the need to facilitate data entry by professional staff by modifying the log book in which professional staff were required to note observations. But studies investigating the effects of feedback on DCTs' performance focused mainly on DCT-client interactions rather than on DCT data-recording behavior.

Effect of Feedback on Data-Recording Behavior of DCTs

While these data-collection procedures are dependent on supervisors for implementation, there are strategies that primarily depend on the behavior of the DCTs themselves for implementation. Such procedures are labeled "self-management". Of interest for this study is the procedure called self-recording in which staff maintain records of their own performance. Richman et al. (1988), in a staff self-monitoring study, used small portable cards and feedback to remind DCTs to increase the time they interacted with clients. Burg, Reid, and Lattimore (1979) and Burgio, Whitman,

and Reid (1983) used self-monitoring to increase the frequency of interactions between institutional staff and retarded residents. But Reid et al. (1989) indicated that, "Self-recording as a staff management procedure has been investigated too infrequently to determine its true efficacy".

The purpose of this research was to extend the currently available literature on the effectiveness of feedback as a means of increasing DCTs' data-recording behavior. This study examined differential effects of two types of feedback--specifically, the effects of verbal and graphic feedback alone and in combination with praise--on self-reported data recording of reinforcer deliveries by DCTs working in an institution housing mentally retarded clients. An additional variable examined was the effect of time of delivery of feedback on subsequent data-recording behavior. These specific variables were selected because Balcazar et al. (1986) noted that "The [feedback] research includes very few experimental comparisons of the effects of the different characteristics of feedback" (p. 81). This study undertook to examine the characteristics identified as mechanism and content of feedback delivery.

This study was similar to others (Burg et al., 1979; Burgio et al., 1983; Richman et al., 1988) that 1) asked on-line staff [DCTs] to record their own behavior as they interacted with clients and 2) used cards for self-monitoring. This study differed from the others listed above because the focus in this study was on the DCTs' behavior and not on the effect of the DCTs' behavior on the client's behavior. This research project described a multi-faceted intervention (multi-faceted in that it contains various

components--face-to-face feedback; verbal and written feedback--as well as elements of self-recording). Reid et al. (1989) reported that multi-faceted interventions have been successfully implemented in human service settings involving paraprofessional staff.

METHOD

Subjects

Twelve DCT staff working on the campus of an institution for the mentally retarded served as subjects. These 12 persons, 6 males and 6 females, worked in a duplex comprised of two apartments. Three of the DCTs worked from 6 a.m. - 2 p.m. and three worked the 2 - 10 p.m. shift in each apartment. The DCTs worked in a rotating pattern so that they were usually on duty for either 3 or 4 days, with either 1 or 2 days off. This pattern allowed for different pairings of the DCTs on each shift and in each apartment.

Setting

This project was implemented in both apartments as well as at the clients' vocational work site. One apartment housed 8 men diagnosed with severe to profound mental retardation. In the adjacent apartment 10 men with identical diagnoses resided. All 12 DCTs rotated between these two apartments and the vocational site. At any given time, there were never more than 3 DCTs on duty and sometimes as few as one per apartment.

Apparatus

DCTs recorded their self-monitored behavior on experimenter-designed yellow 4" X 5" data cards containing the following information 1) date; 2) time of day; 3) name of DCT and client; 4) general categories of appropriate behavior--working on vocational task, complying with programming request, initiating any other appropriate behavior; 5) general categories of reinforcers--social verbal, social tactile and edibles, listed at the bottom of the data card. DCTs were trained to place a check in each column describing a category of appropriate behavior they observed and a check in the columns indicating all the categories of reinforcers they delivered contingent on the appropriate behavior.

A second data card (white, also 4" X 5"), required by the institution, was used to record incidence of client problem behavior observed by DCTs. This recording was formally trained by each unit psychologist. (See Appendix A for a copy of the yellow and white data cards.) The experimenter provided a special box into which the DCTs placed both data cards at the end of their shifts.

Experimental Conditions

There were three independent variables: 1) verbal and graphic feedback (variables B and C, respectively), based on total number of reinforcer deliveries recorded on the previous day's yellow data card; 2) praise (variable D), which accompanied the verbal report and graphic display; and 3) time of delivery of feedback. Feedback was delivered to 6 DCTs at the end of the morning shift and to 6 DCTs at the beginning of the evening shift. The dependent variable being measured

was the number of reinforcer deliveries recorded by the 12 DCTs on their yellow data cards.

Experimental Design

Three subjects on the a.m. shift and three on the p.m. shift, in the two apartments comprising the duplex, worked under the following sequence of conditions: A-B-A-B-BD-B, where A was baseline, B was verbal feedback, and D was praise.

Three subjects on the a.m. shift and three on the p.m. shift, in the two apartments, worked under the following sequence of conditions: A-C-A-C-CD-C, where A was baseline, C was graphic feedback, and D was praise. The researcher delivered all feedback to all 12 subjects.

Procedures

Previously, DCTs' duties included only general maintenance of clients and the clients' environment as well as collection of frequency data on clients' maladaptive behavior. Prior to this study, DCTs were charged with collecting data on their own delivery of reinforcers for desired client behavior. Staff had been instructed to deliver reinforcers and trained to record those deliveries. This responsibility then became part of the DCT staff's daily routine. In Condition A, all 12 subjects performed their usual duties.

In Condition B the researcher approached the 6 DCTs who received verbal feedback, while holding a blank copy of the yellow card and delivered verbal feedback to each DCT individual--"Yesterday during your shift you documented [n# of]

reinforcers on your card". This feedback was based on the number of reinforcer deliveries recorded on those data cards turned in daily by each DCT. If no cards were turned in by a DCT the experimenter said, "Yesterday during your shift you documented zero deliveries of reinforcers on your card."

In experimental condition C, equal-interval line graphs were distributed to each DCT individually. In providing this individual feedback the researcher held up a blank copy of that DCT's previous day's yellow card and said, "Here's your data from this card," and handed each subject the graph, with the number of reinforcer deliveries on the Y axis and the 8 sessions indicated on the X axis. These data points represented the 8 data-collection sessions for each phase. If there were no deliveries recorded by some DCTs the experimenter handed back those graphs with zeroes across the time line.

In experimental condition D the experimenter approached each DCT and provided the usual verbal or graphic feedback plus added praise: "You're doing a good job"/"Thanks for turning in your data so consistently." Each phase (B, C, BD, and CD) covered at least two work patterns (eight non-consecutive working days) for each subject except in the short final phase which covered one work pattern, four non-consecutive working days.

The experimental variable dealing with time of delivery of feedback was arranged as follows. The six subjects on the morning shift received their feedback at

the end of their shift--1:30 p.m. daily; whereas, the six subjects on the evening shift received their feedback at the start of their shift--2 p.m. daily.

At the end of the study all 12 DCTs were debriefed. The debriefing consisted of asking each subject a series of eight questions (see Appendix D, Post- Experimental Questionnaire), including whether or not the subject recorded any data (and if not, why not), the usefulness of the data card versus recording data on the usual institutional data sheet, asking for a description of any problems with using the data cards.

Correspondence Checks. Deacon and Konarski (1987) identified correspondence as a relationship between a person's verbal behavior and subsequent (or prior) nonverbal behavior. The experimenter conducted correspondence checks in this study to verify that the DCTs were, in fact, delivering reinforcers for appropriate client behavior as well as recording their reinforcer deliveries on the yellow data card (i.e., checking say-do correspondence). The correspondence checks implemented in this project involved 20 40-minute observation periods across the study during which the experimenter noted the reinforcer deliveries carried out by the DCTs on duty during that time period.

Every subject was observed at least three times over the course of the study. For each observation period, the experimenter recorded name of DCT, date, time, shift, and type of reinforcer delivered. (See Appendix B for sample of Correspondence Check Data Card.) The correspondence check occurred when each DCT turned in the

completed yellow card that included the observation period, and the experimenter checked the DCT data against the data he had recorded on the Correspondence Check Data Card for that observation period.

Data Analysis. Frequency data analysis was based on pre- and post-intervention data card counts of reinforcer deliveries. An indirect measure of the effect of self-recording reinforcer deliveries was the number of client problem behaviors recorded/day (on the white card) across all experimental conditions. In addition to 12 graphs illustrating frequency of each subject's self-recorded reinforcer deliveries, there are another 12 graphs depicting each subject's recording of frequency of occurrence of problem behavior across all experimental conditions.

Correspondence data analysis was based on data entries from the yellow data cards--entries made by each subject and the experimenter during each of the 20 40-minute observation periods.

RESULTS

An important discrimination needs to be made at this point. While there were zeros recorded on all figures (see Appendix C) and on Table 1, these zeros refer to different events. The zeros shown in the figures indicate that on that day and for that session no data cards were returned to the experimenter. The zeros in Table 1 (Correspondence Checks for Each DCT) indicate that during the 40-minute observation staff did not record any reinforcer deliveries. On the occasions during which staff reported zero reinforcer deliveries and the experimenter observed reinforcer deliveries

he recorded what he observed, regardless of whether or not the DCT entered any data during that interval.

Data from Subjects Receiving Verbal Feedback

The performance of each subject receiving verbal feedback is described in Figures 1-6. All subjects receiving verbal feedback increased the number of reinforcer deliveries they recorded during some of the experimental conditions. Only S1 and S7 recorded any reinforcer deliveries during the first baseline. All subjects recorded reinforcer deliveries during first feedback; however, S1, S4, S5 and S6 recorded more reinforcer deliveries than did S7 and S9. There was a progressive increase in the number of reinforcer deliveries recorded by S1, S4, S5, and S6 across first feedback phase.

Under the second baseline conditions S5 and S9 stopped recording. S1 maintained the rate established during first feedback condition (170 deliveries recorded) for 2 sessions of the second baseline and then recording dropped precipitously to 0 and remained there throughout the rest of the second baseline. Likewise, S6 recorded 40 deliveries at the end of first feedback and during the first session in the second baseline, and recording during the second baseline stopped thereafter. Both S4 and S7 inconsistently recorded number of deliveries across the second baseline.

Reintroducing verbal feedback in the second feedback phase had a similar effect on recording behavior of S6 and S4. Both DCTs initially recorded no data and

then their recording behavior began to increase. This increase continued across 5 sessions for S4, and across 6 sessions for S6; then, frequency of recording for both subjects declined slightly. There was more variability in the number of reinforcer deliveries recorded by S5 and S1, although the pattern for both indicated an overall increase over first feedback condition. S7's recording, while indicating an overall increase over previous phases, dropped to 0 during sessions 30 and 32. S9 recorded data only during sessions 26 and 31.

In the Feedback-Plus-Praise condition S1, S5, and S6 exhibited considerable variability with S1's performance increasing from 138 to 240 deliveries, S5's deliveries jumping from 40 to a high of 180 and then stabilizing at approximately 120. S6's performance was also variable, with an increasing trend. S4's performance stabilized within a range of 120-130. S7's performance remained low but stable within a range of 15-30 deliveries. S9 recorded 5 deliveries during session 33 and 15 during session 34; thereafter, S9 did not record any further reinforcer deliveries.

The third feedback condition, verbal feedback alone, differed from all previous experimental phases in that it encompassed 4 rather than 8 sessions. S9 never recorded reinforcer deliveries under the third feedback conditions, as this DCT apparently had stopped recording any data after session 34 during Feedback-Plus-Praise condition. S4, S5 and S6's performances showed a slight acceleration over the 4 sessions in the third feedback phase. Conversely, S7's recording of reinforcer deliveries sharply decelerated during the third feedback phase. The variability in S1's

recording behavior in Feedback-Plus-Praise carried over into the third feedback condition.

In summary, S1, S5, and S6 responded under all feedback conditions and either did not record reinforcer deliveries or recorded data over 1-2 sessions during the second baseline and then stopped responding. While S9 recorded few reinforcer deliveries under the feedback conditions, this DCT did not record any data during Baselines 1 and 2, and stopped recording any data after session 34 (during Feedback-Plus-Praise). S7 recorded during all phases of this study and S4 recorded data during all conditions except during the first baseline.

Data from Subjects Receiving Graphic Feedback

The data for these subjects is shown in Figures 7-12. Data patterns for S2 and S8 were similar in that neither recorded any data during the first baseline and during first feedback and 2 phases both subjects' recording rates increased substantially. Both these DCTs' recording of their reinforcer deliveries stabilized across Feedback-Plus-Praise and the third feedback conditions. In the second baseline the data path for S2 and S8 differed noticeably in that after the initial 2 sessions S2 stopped recording any data; whereas, S8 continued recording in a pattern that reflected high variability.

S3 recorded no delivery of reinforcers during the first baseline phase, but thereafter and throughout all the subsequent phases S3 recorded reinforcer deliveries during 28 of the final 36 sessions. By contrast, S10 and S11 recorded reinforcer deliveries only during first feedback phase. S12, on the other hand, recorded during

Feedback Phases 1 and 2, but, like S10 and S11 did not record any data under Feedback-Plus-Praise nor under the third feedback conditions.

Overall, subjects in the graphic feedback condition recorded fewer deliveries (total of 7549) compared to deliveries recorded by subjects in the verbal feedback condition (total of 11,734). The difference in the totals is mainly due to the fact that only two of the subjects receiving graphic feedback recorded a significant number of reinforcer deliveries; whereas, 4 of the 6 subjects receiving verbal feedback recorded a large number of deliveries.

Time of Delivery of Feedback

The third variable examined was the relationship between time during the shift that feedback was delivered and the subsequent number of recordings turned in by staff. During the experiment 6 DCTs received their feedback at the start of their work shift and 6 at the end of their work shift, thereby counterbalancing time for feedback delivery. Of the 6 subjects who received feedback about their previous day's performance at the beginning of their shift, 5 were subjects whose data-recording behavior showed a marked increase over the course of the study.

These 5 subjects included S1, S4, and S6, all of whom were in the group who received verbal feedback. Likewise, these same 3 subjects were among those who recorded the most reinforcer deliveries (i.e., S1, 5200 deliveries; S4, 2428 deliveries; S6, 1879 deliveries). The other two, S8 and S3, were in the group who received graphic feedback. These two subjects were also those who recorded the highest

numbers of reinforcer deliveries in the group receiving graphic feedback (i.e., S8, 3801 and S3, 232).

Of the 6 subjects who received their feedback at the end of their shift, 3 were among those subjects whose data showed a marked increase across time. Two of the subjects, S5 and S7, were in the verbal feedback group, but were among the low recorders in that group (i.e., S5, 1781 and S7, 405). The other subject, in the group receiving graphic feedback was S2 (recorded 3443 deliveries). These results do not allow for a clear conclusion that time of delivery of feedback was a variable that contributed to number of reinforcer deliveries recorded, because 1) many of the high recorders happened to be in the shift that received their feedback before they started work; 2) many of the low recorders happened to be in the shift the received their feedback as they were leaving work. The effect of time of delivery of feedback has not been considered in prior feedback studies, was not answered in this investigation and should be considered in future studies.

Correspondence Checks

The results of the 20 40-minute correspondence checks are shown in Table 1. The experimenter recorded only those reinforcer deliveries that met these criteria: 1) the reinforcer delivery had to occur immediately following occurrence of a client's appropriate behavior. 2) the reinforcer delivery had to be accompanied by the DCT's verbal labelling of the resident's appropriate behavior while, or immediately following, delivery of the reinforcer. As may be seen in Table 1, the experimenter recorded

more deliveries of reinforcers (total of 167); than did the DCTs (combined total of 75). The large number of zeroes shown in Table 1 resulted from the fact that the correspondence checks made by the experimenter were recorded during a 40-minute interval out of each subject's 8-hour work day. According to these data every subject underreported the number of reinforcer deliveries.

Table 1. Correspondence Checks for Each DCT

S7	6	2	0	0		S12	0	0	0	0	0	S1	0	17	0		
Exp	8	2	0	0		Exp	0	4	0	0	0	Exp	13	25	0		
S#	9	27	34	42		S#	9	20	26	35	43	S#	11	25	33		
S2	0	0	20	0		S5	0	0	0	0	0	S9	0	0	0		
Exp	0	0	20	0		Exp	0	5	0	0	0	Exp	0	0	0		
S#	9	27	34	42		S#	9	20	26	35	43	S#	11	26	35		
S8	0	0	35	0		S10	0	0	0	0	0	S3	0	0	0	0	0
Exp	0	15	45	0		Exp	0	4	3	0	0	Exp	0	2	0	0	0
S#	10	28	35	41		S#	9	21	29	36	42	S#	10	21	28	36	42
S4	0	0	0	0		S11	0	0	0	0	0	S6	0	0	3	0	0
Exp	0	6	0	0		Exp	0	3	2	0	0	Exp	0	4	6	0	0
S#	10	28	35	41		S#	11	21	29	35	41	S#	11	22	28	35	42

Note: There are correspondence checks for each subject but not for each subject across all experimental phases. S = Subjects' data recorded during corresponding 40 minute interval. Exp = Experimenters' correspondence checks. S# = Session number during which check was made.

Problem Behavior Data Recorded During Verbal and Graphic Feedback Conditions

The number of problem behaviors recorded by the 12 subjects over the verbal and graphic feedback conditions are shown in Figures 1A-12A. Throughout the study there were no consequences for recording problem behavior data delivered by the experimenter (nor by any other institutional staff). Across the first baseline condition only S1, S2, S4, S5, S7, and S12 recorded any occurrences of problem behavior. During the first feedback condition all subjects recorded at least one incidence of problem behavior. At return to baseline (the second baseline phase), S1, S2, S3, S4, S5, S6, S7, S8, S9, and S12 continued to report problem behavior data; however, S1, S2, S4, S5, S7, and S12 recorded data at a higher rate during the second baseline than they had recorded during first feedback condition. The data recording rate for all subjects in graphic and verbal feedback conditions decreased across the second feedback, Feedback-Plus-Praise and the third feedback phases. Although the data pattern did reflect this decrease in recording incidences of problem behavior, the overall rate of recording for all subjects in this study was higher than the rate reported during the first baseline.

Figure 13, illustrating the total number of reinforcer deliveries and incidences of problem behavior recorded over all sessions by all subjects, shows that from the second feedback through the third feedback conditions as deliveries of reinforcers increase across conditions, recording of problem behavior decreases.

DISCUSSION

The results of this investigation provided data that both conflicted and agreed with statements from prior studies. First, despite Balcazar et al.'s (1986) and Fairbank and Prue's (1982) reports that feedback delivered via graphic presentations was more effective than other mechanisms used for delivering feedback, the findings from this study do not support their statements. During this study, 6 of the 12 subjects received graphic feedback and 6 received verbal feedback, and the 6 subjects who received verbal feedback recorded more reinforcer deliveries than did the 6 subjects who received graphic feedback.

Difference in Recording Rates

One explanation for the difference in recording rates between subjects in the graphic and verbal feedback conditions might lie in the differing conditions under which the two types of feedback were delivered. Delivering verbal feedback required that the experimenter establish eye contact and talk with each subject. Delivering graphic feedback involved giving each subject a graph, requiring fewer overall verbal interactions between the subject and the experimenter. Thus, the experimenter talked less with the subjects receiving graphic feedback. The verbal interactions, although neutral (except during the Feedback-Plus-Praise condition), with the subjects receiving verbal feedback, may have been a critical factor because of the conditions that existed before this study was implemented.

Prior to the study DCTs' data-recording behavior was never consequence. Data collection was handled in the following manner: 1) DCTs were handed clipboards holding blank data sheets and told to record all incidences of problem behavior that they observed. 2) These data sheets were either not collected or replaced or were inconsistently collected and replaced. 3) When DCTs ran out of data sheets to complete they either stopped picking up the clipboards or they stuffed the completed data sheets into open desk drawers, and the sheets remained where they were placed. There were no differential consequences for DCT compliance or noncompliance. So, verbal feedback (i.e., attention) from the person whom they saw picking up their data cards may have enhanced the value of even a brief interaction with that person.

This study does not support to Balcazar et al.'s contention that combining feedback with other behavioral consequences will be more consistently effective than delivering feedback alone. In this study, the added behavioral consequence, praise, did not appear to affect the rate at which staff recorded their delivery of reinforcers during the Feedback-Plus-Praise condition. When S1, S4, S5, S6 and S7 returned to feedback alone condition their data-recording behavior continued to increase. This increase was part of an increasing trend that began in the second feedback phase and was continued throughout the other two experimental conditions.

The data recorded by all of the subjects receiving verbal feedback showed some variability, which might have eventually stabilized had each phase run longer than 8 sessions (and had the third feedback condition been run longer than 3 sessions).

No stability criterion was established for the experimental conditions due to time constraints.

Gender Difference

A subject variable in this study, gender difference, proved to be of interest. Of the 8 subjects whose data recording increased over time, 6 were females; whereas, the 4 subjects who recorded very few reinforcer deliveries were males. During debriefing, while interviewing each subject (see copy of the interview sheet in Appendix A), the investigator asked two questions: "Did you record data everyday?" and if the subject replied, "No," the next question was, "Why?"

When asked these questions, S12 reported that because English was his second language he did not do much of the documentation that was required of DCTs. S12 stated that on his shift there were always female co-workers who handled that job for him. S9 reported that he found carrying the data cards all the time to be inconvenient. S11 said that he knew he always delivered positive reinforcers to his clients for their good behavior and he did not care if anyone else knew. S10 answered that during his shift there was always more problem behavior occurring than appropriate behavior and so he rarely delivered any reinforcers. A common answer given was that working alone with 8-10 severely to profoundly retarded men did not leave staff time to record their own behavior. The women in this study all answered yes to the question: "Did you record data everyday?" and no one responded to "Why?" While this study does not provide conclusive evidence that gender affects data-recording behavior, based on

these data more women (i.e., 6) versus men (i.e., 2) recorded delivery of reinforcers for appropriate client behavior.

Correspondence Data

The correspondence check reported in this study served one purpose: to check the match between the reinforcer deliveries recorded on each DCT's data card and the direct observations made by the experimenter. In some self-recording studies (e.g., Burg, Reid, & Lattimore, 1979; Burgio, Whitman, & Reid, 1983; Richman et al., 1988) experimenters used time-sample recording as well as a second measure (e.g., improvement in the clients' behavior) to validate the staff's self-reported data.

According to the data in Table 1, all the DCTs under-reported their reinforcer deliveries. One possibility for under-recording could be the response effort involved in this sequence of behaviors. In fact, the debriefing question ("Did you find the small yellow and white cards a hinderance?") appears to validate this conclusion because staff answered that it took as much time to complete the small cards as it had to fill in the sheets [used prior to this study].

Importance of Problem Behavior Data As An Indirect Measure

Wong, Floyd, and Innocent (1992) used an indirect measure (seclusion/restraint records) to monitor the effect of their intervention. In the present study, the indirect measure was the problem behavior data recorded on white cards across the experimental conditions in the study. While not conclusive, an inverse relation appeared to exist between the recordings of these two types of data: while there was

an increase in the number of reinforcer deliveries recorded there was an overall corresponding decrease in the number of problem behaviors recorded during the same time period.

This relation could be considered as another check on DCT self-recording behavior. During first feedback condition when DCTs were receiving feedback for self-recording delivery of reinforcers there was also an increase in recording of problem behavior. And when the second baseline was instituted, while recording of reinforcer deliveries (with the exception of S4) decreased, the DCTs continued recording problem behavior (excluding S9, S10, and S11 who rarely recorded any problem behavior data). It is possible that the introduction of feedback increased the rate of data-recording of all client behavior per se. While consequences for recording reinforcer delivery were removed during the second baseline, recording of problem behavior had never been consequated; thus, it was not affected by the second baseline conditions.

From the second feedback condition until the end of the study, however, there was a definite decrease in recording of problem behavior. It is possible that while DCTs were delivering more reinforcers for appropriate behavior the clients' inappropriate behavior decreased in frequency. Another possibility is that while the DCTs were focusing on reinforcing desirable behavior there was a shift in their recording behavior--from noting problem behavior to noting desirable behavior. Thus,

the design of this study may have unwittingly put DCTs' recording of problem behavior on extinction--a differential reinforcement effect.

The decrease in reported rates of problem behavior was an important measure of the effect of DCTs' self-monitoring of reinforcer deliveries, since the correspondence data indicated DCTs were under-reporting their reinforcer deliveries. The only other check, given the data reported in Table 1, was the problem behavior data.

Directions for Future Studies

Several questions were suggested by the results of this investigation: first, if an increase occurred in self-recording during a Feedback-Plus-Praise condition, could such an increase be maintained without the praise component? The results of this intervention were inconclusive because the third feedback condition was not run for a long enough period. Second, is there an optimum time during which to deliver feedback to produce maximum change in targeted staff behavior? Again, while the results of this intervention point to a difference in data-recording behavior when feedback was delivered at the start versus the end of the work shift, too many uncontrolled variables (e.g., location for feedback delivery; co-workers on each shift; presence or absence of others when feedback was delivered) prevent reaching any definite conclusions; however, the data are suggestive of an effect due to the time during the shift when feedback was delivered.

This study does, however, provide support for Richman et al.'s (1988) statement that "self-monitoring procedures have been effective in managing [i.e., changing] staff behavior when used as part of multifaceted programs" (p. 402). Implementing cost-effective procedures to produce and maintain targeted changes in client behavior ultimately becomes the responsibility of on-line staff in institutional settings. Self-recording data methods are cost effective in terms of time and financial resources. And this study is the first that has relied solely on data collected by direct care staff. And if on-line staff are to be asked to self-record, their self-recording behavior needs to be monitored carefully.

Therefore, further research in actual institutional settings to discover the variables accounting for effective feedback methodology is warranted. This study provides another step in this desired direction.

APPENDIX A
INFORMED CONSENT FORM

Informed Consent for Supervisor

I, _____, agree that my direct care trainer staff will participate in a study to investigate direct care trainers data- recording behavior. The requirements for participating in this study will not require outside activities. I understand that my staff will carry out their routine daily delivery of services to residents who are assigned to their care for an 8 hour period each day. I understand that my staff may be required to participate in as few as 2 months of daily sessions, or as many as 4 months of daily sessions.

My staff will not be associated with any of the results of the experiment. None of the resulting data will be used to reprimand my staff or for any other disciplinary actions.

Date

Signature of QMRP (Supervisor)

Date

Signature of Investigator

Informed Consent for Subjects

I, _____ I have been informed by Jewlon Morris, the Behavior Therapist for this apartment, that my data- recording behavior has been part of a research design. I agree to allow Jewlon to use this data in any publication with the understanding that there are to be no identifying characteristics tied to the data that would violate my confidentiality or reveal my identity.

Date

Signature of Participant

Date

Signature of Investigator

APPENDIX B
DATA CARDS

Small White 4" X 5" Data Card

Resident: _____ Date _____ Staff Name: _____

Time Start	Time Stop	What happened just before the problem	What was the Problem Behavior	What did staff do afterwards	How bad 1,2,3

How bad Code: 1) No visual injury 2) Moderate injury 3) Severe injury

Small Yellow 4" X 5" Data Card

Resident: _____ Date: _____
 Staff's Name: _____

Time	Initiates Appropriate Behavior		
	Complies with a Request		
	Working on a Task		
	Reinforcer Given		

1) Social Verbal 3) Edible
 2) Social Tactile 4) Money/Token

Small 4" X 5" Interobserver Agreement Data Card

Small 4" X 5" Interobserver Agreement Data Card

<p>Reinforcers delivered for: a) initiates appropriate Bhvr b) complies with request c) working on a task</p>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Staff</th> <th style="padding: 2px;">Deliveries</th> </tr> </thead> <tbody> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> <tr><td style="height: 20px;"> </td><td> </td></tr> </tbody> </table>	Staff	Deliveries													<p>enter the number for type of reinforcer given next to the staff's name.</p> <p>Date: _____</p> <p>Time: _____</p> <p>Apt. _____</p> <p>Shft: _____</p>
Staff	Deliveries														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">1) Social Verbal</td> <td style="padding: 2px;">3) Edible</td> </tr> <tr> <td style="padding: 2px;">2) Social Tactile</td> <td style="padding: 2px;">4) Money/Token</td> </tr> </table>		1) Social Verbal	3) Edible	2) Social Tactile	4) Money/Token										
1) Social Verbal	3) Edible														
2) Social Tactile	4) Money/Token														
<p>Person Taking Data: _____</p>															

APPENDIX C

FIGURES

Figure 1. Total number of reinforcer deliveries recorded per session by Subject 1

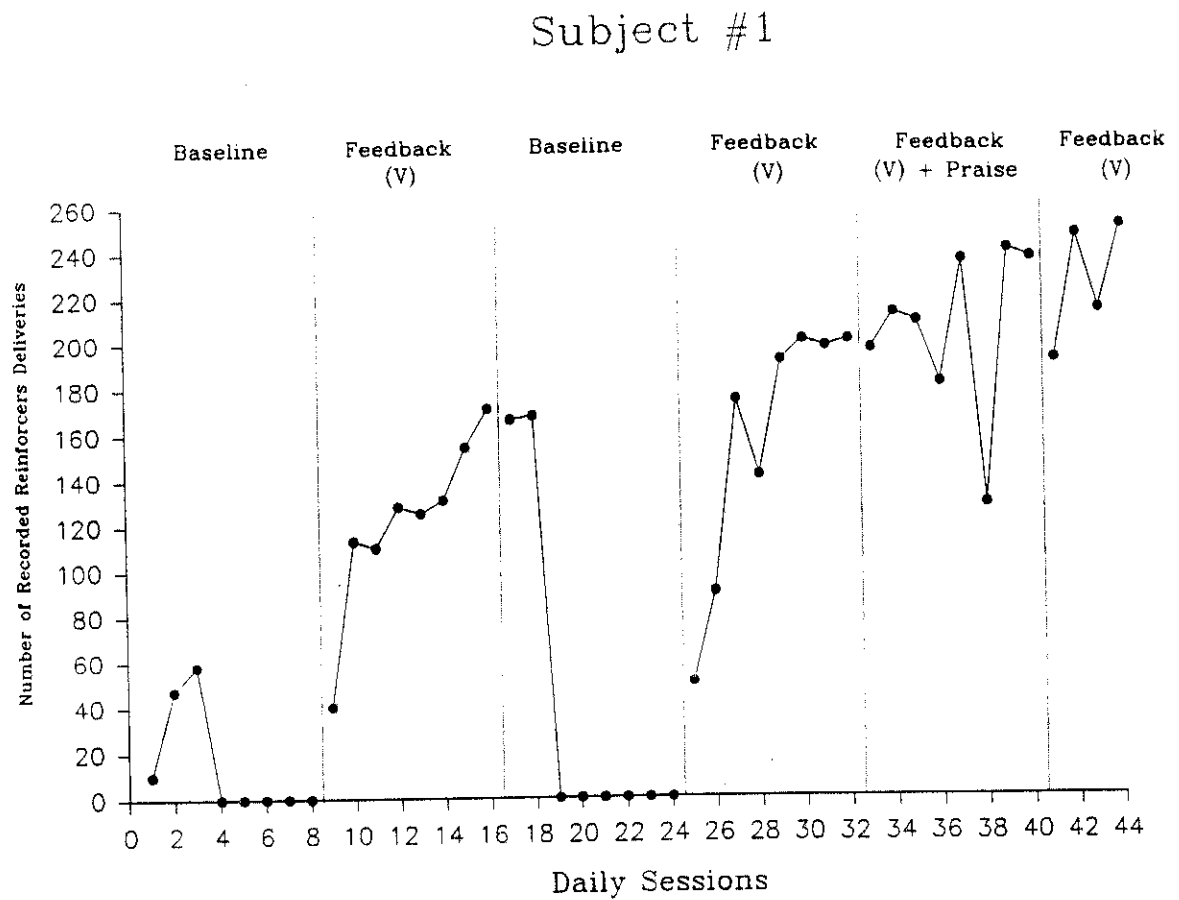


Figure 2. Total number of reinforcer deliveries recorded per session by Subject 6

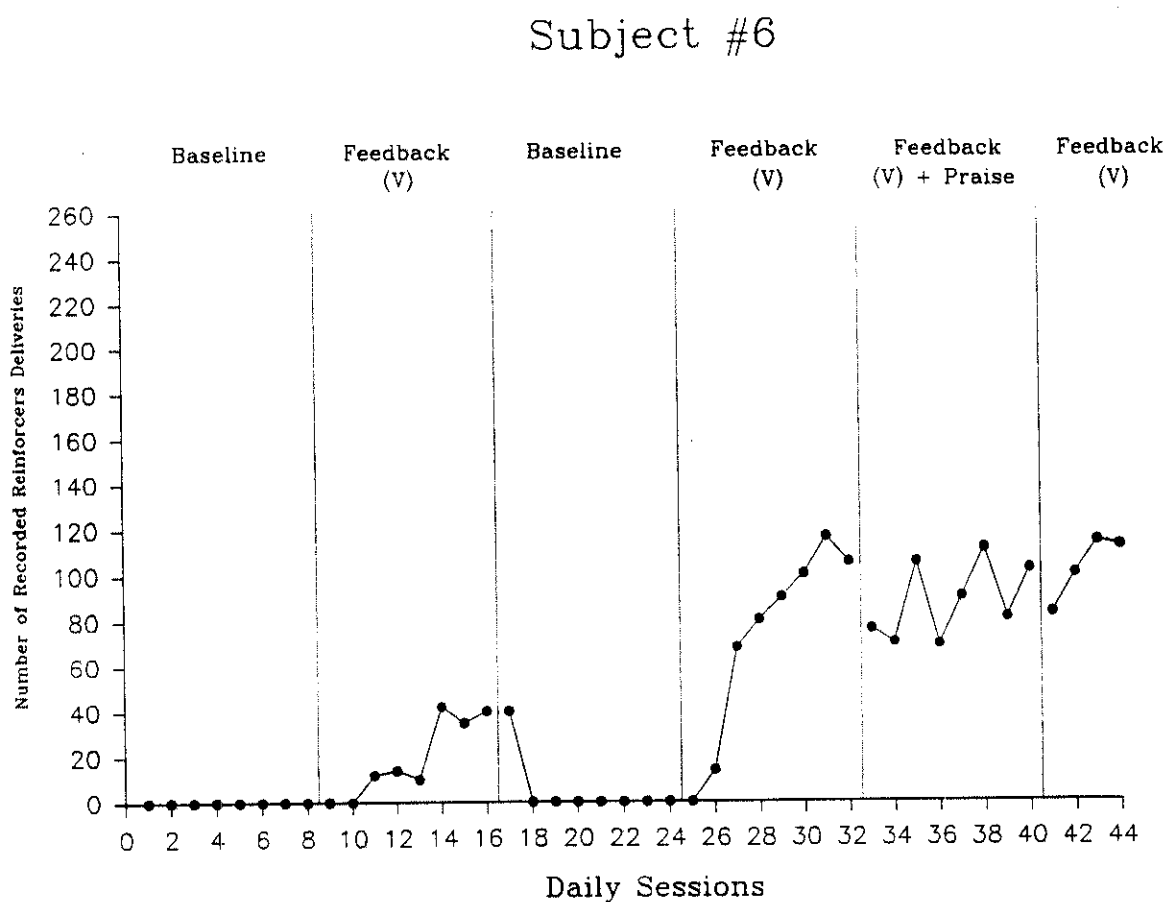


Figure 3. Total number of reinforcer deliveries recorded per session by Subject 7

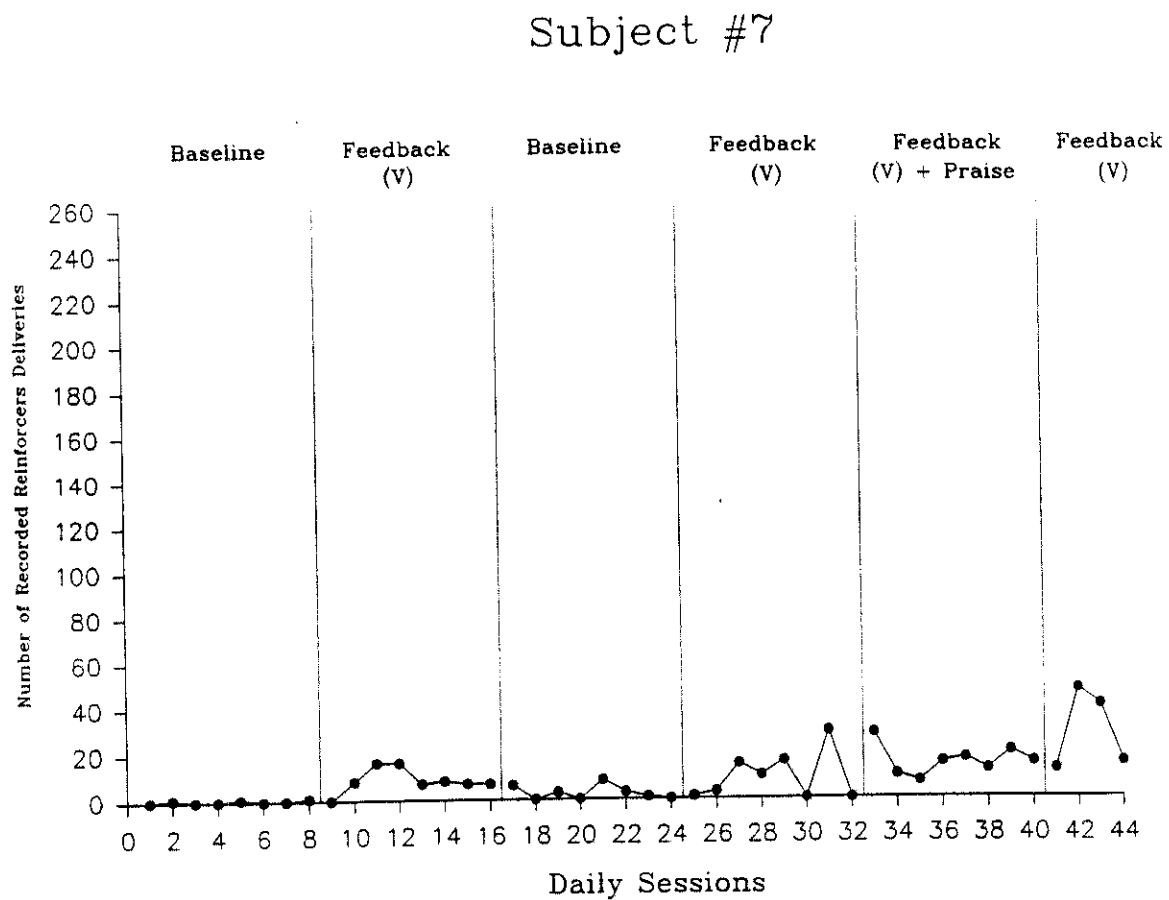


Figure 4. Total number of reinforcer deliveries recorded per session by Subject 4

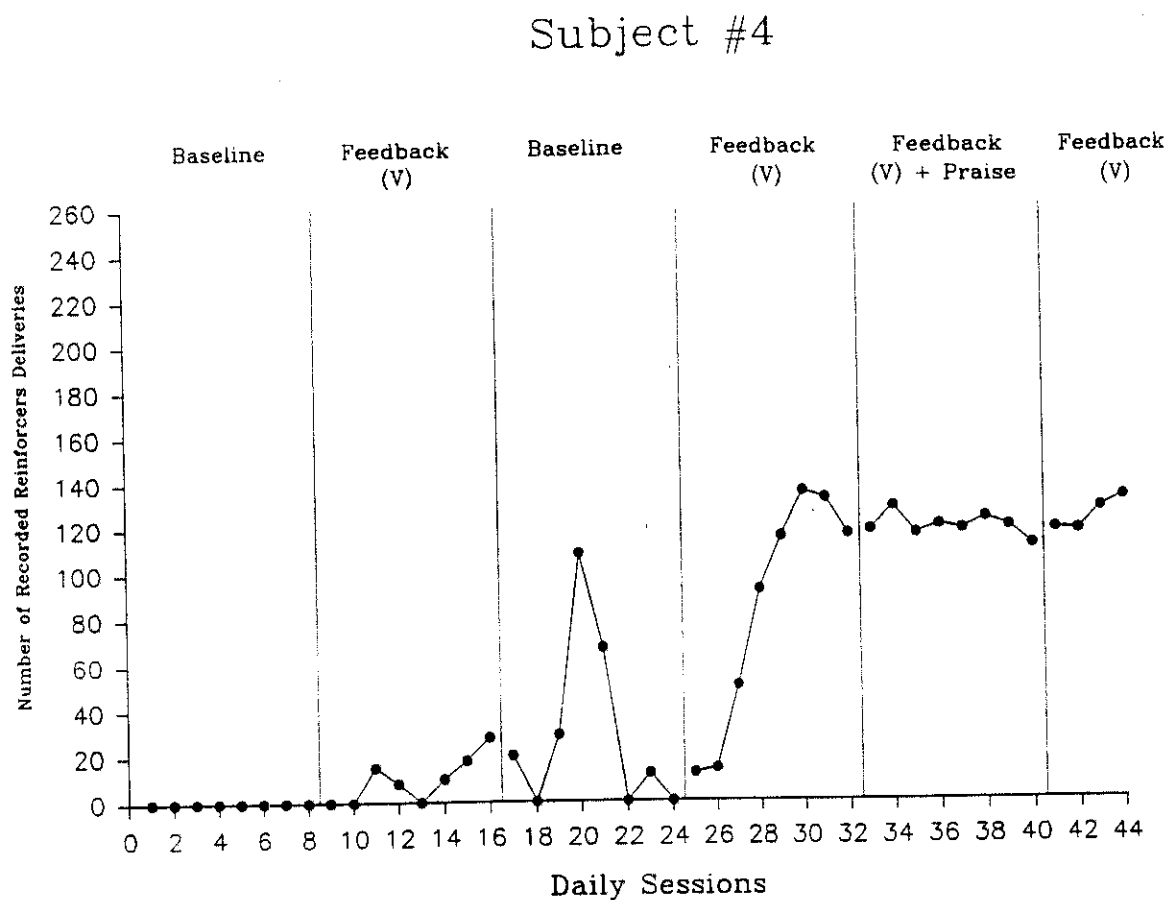


Figure 5. Total number of reinforcer deliveries recorded per session by Subject 5

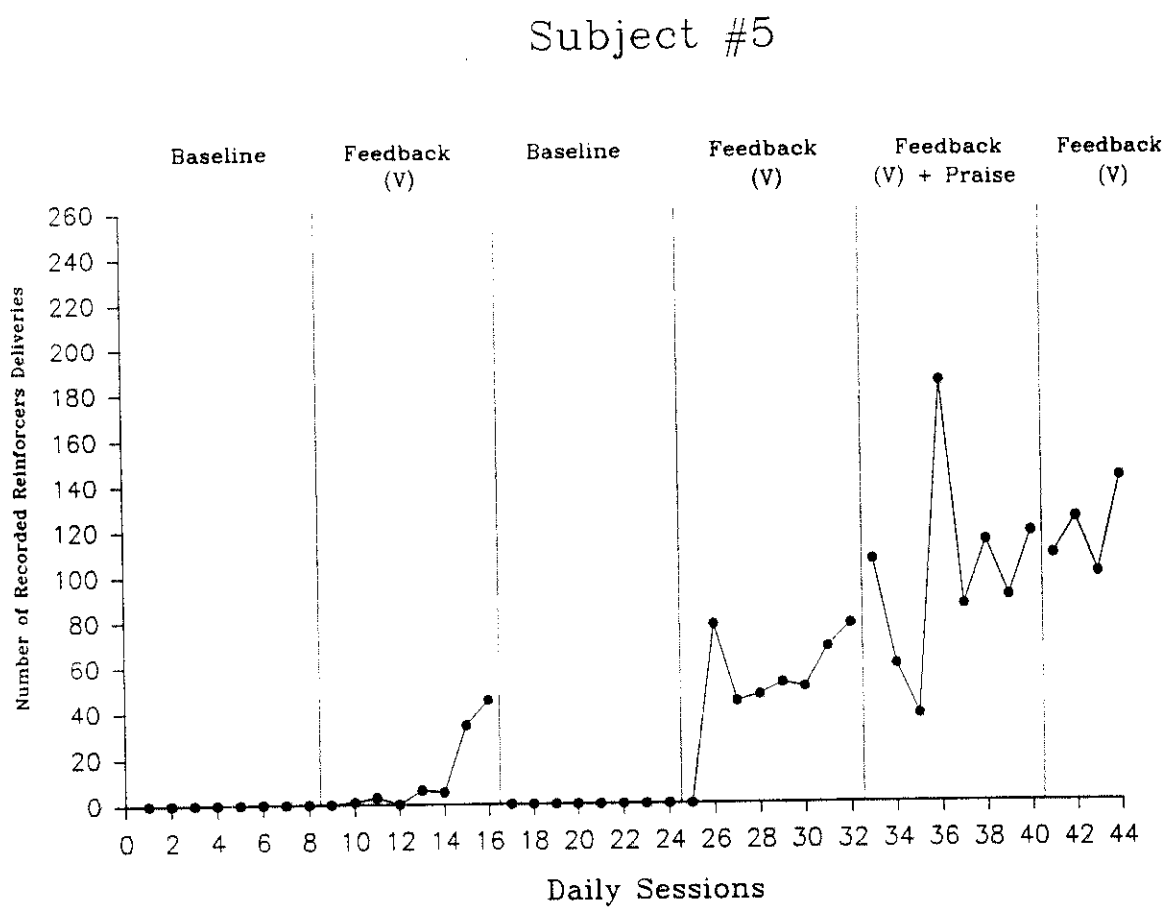


Figure 6. Total number of reinforcer deliveries recorded per session by Subject 9

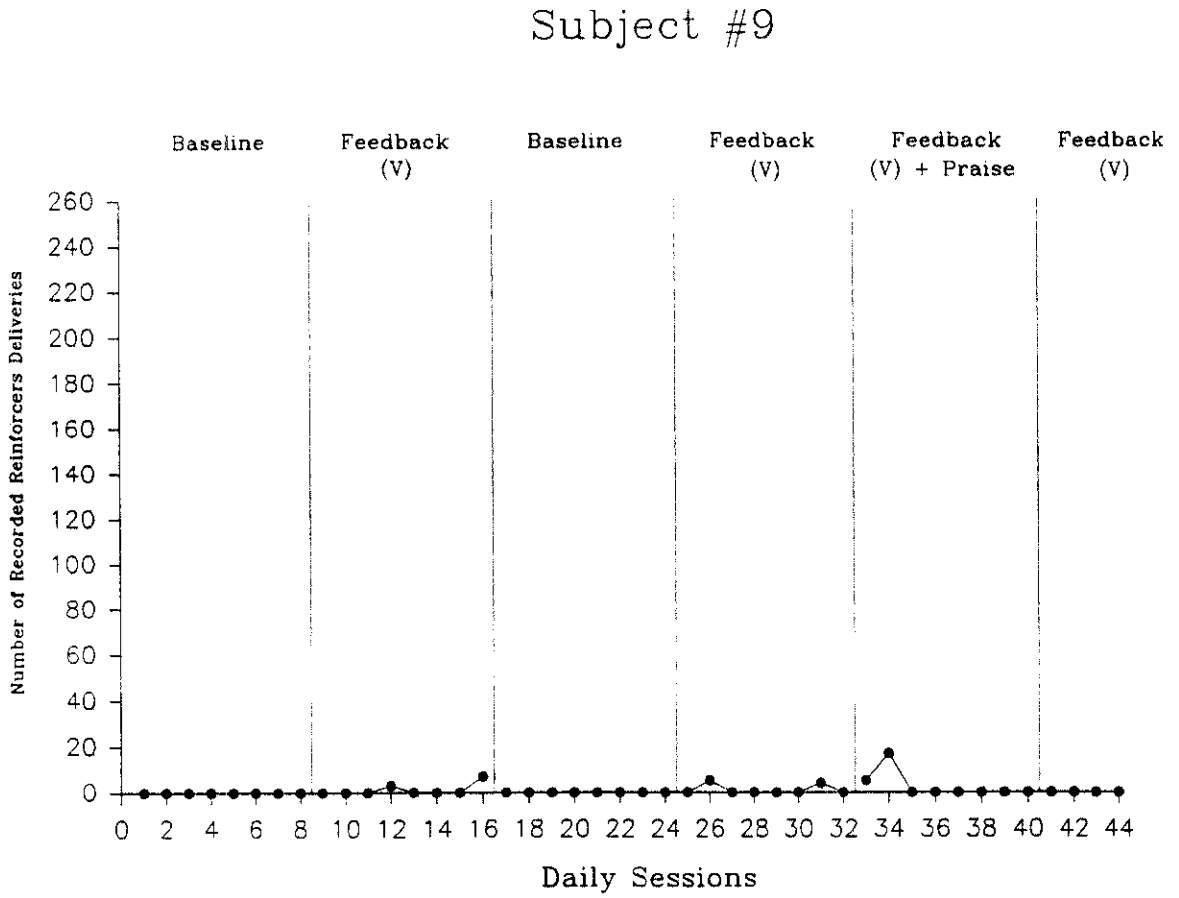


Figure 7. Total number of reinforcer deliveries recorded per session by Subject 3

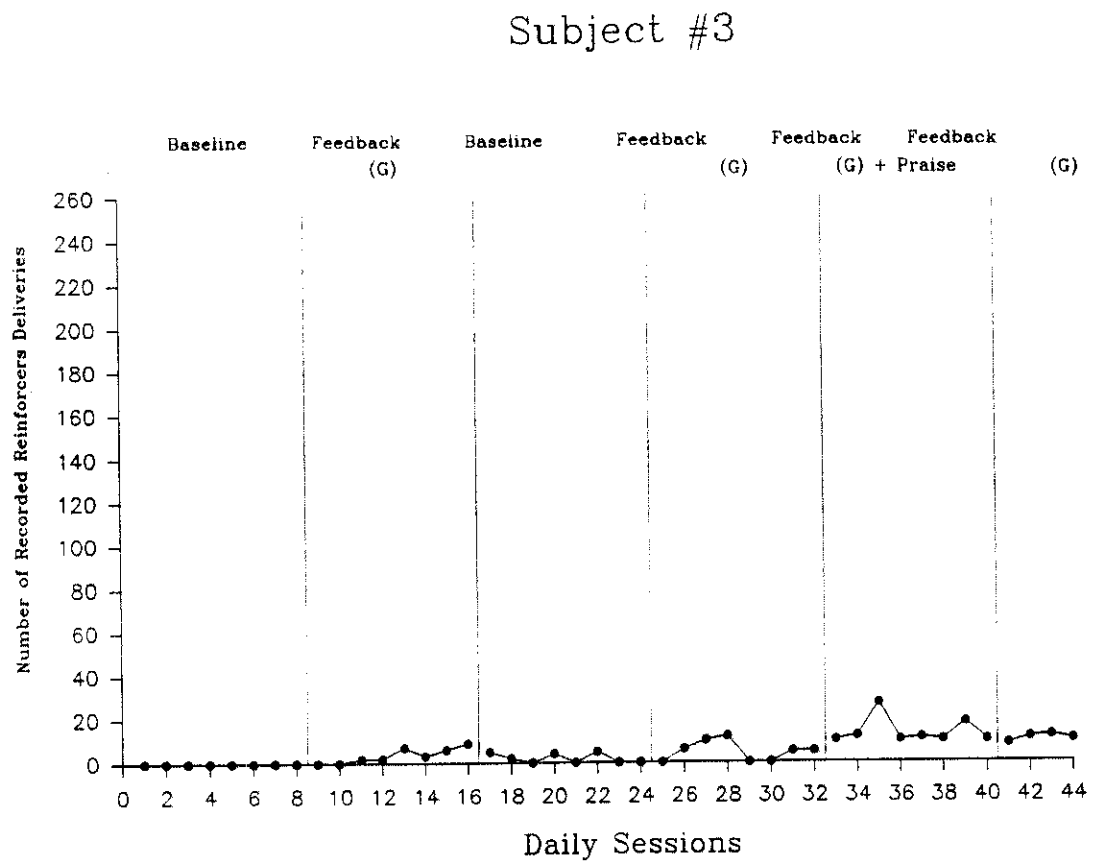


Figure 8. Total number of reinforcer deliveries recorded per session by Subject 8

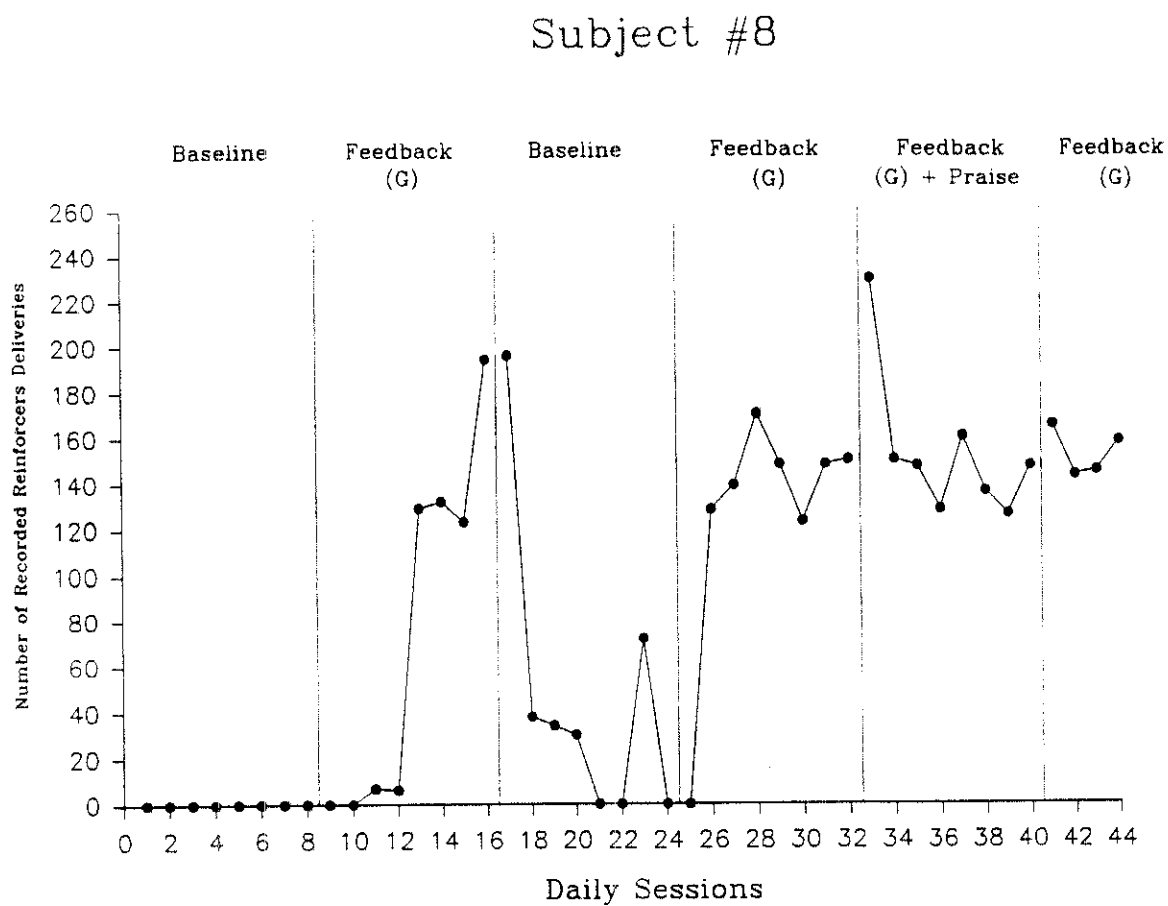


Figure 9. Total number of reinforcer deliveries recorded per session by Subject 2

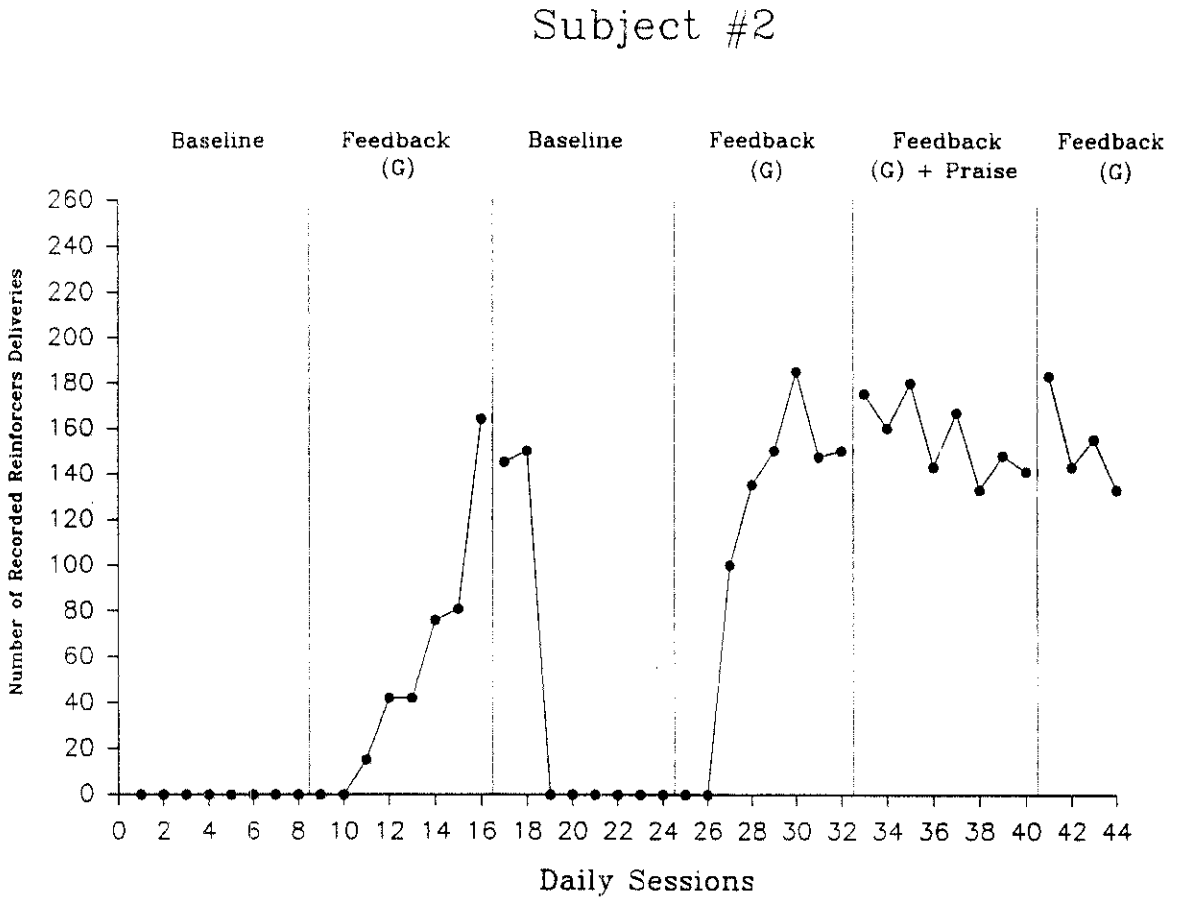


Figure 10. Total number of reinforcer deliveries recorded per session by Subject 10

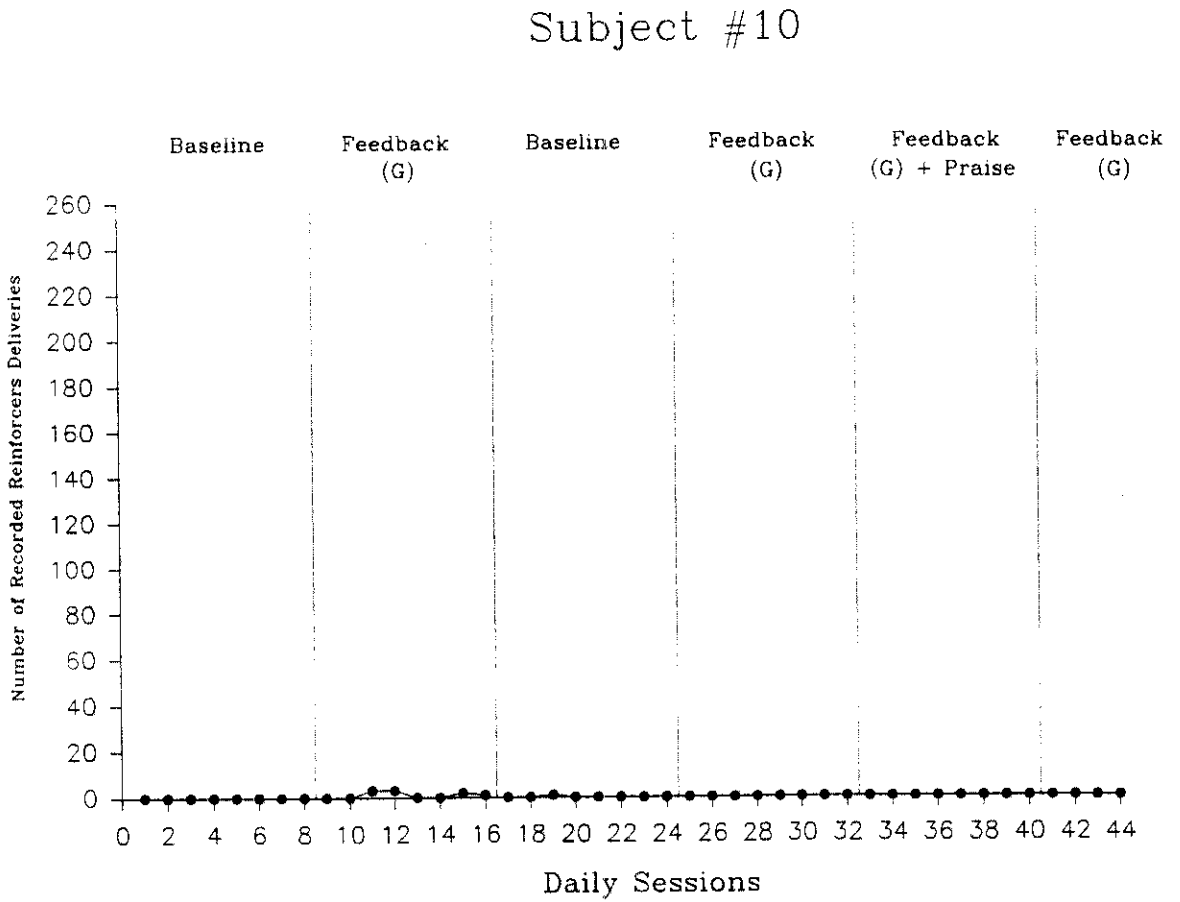


Figure 11. Total number of reinforcer deliveries recorded per session by Subject 11

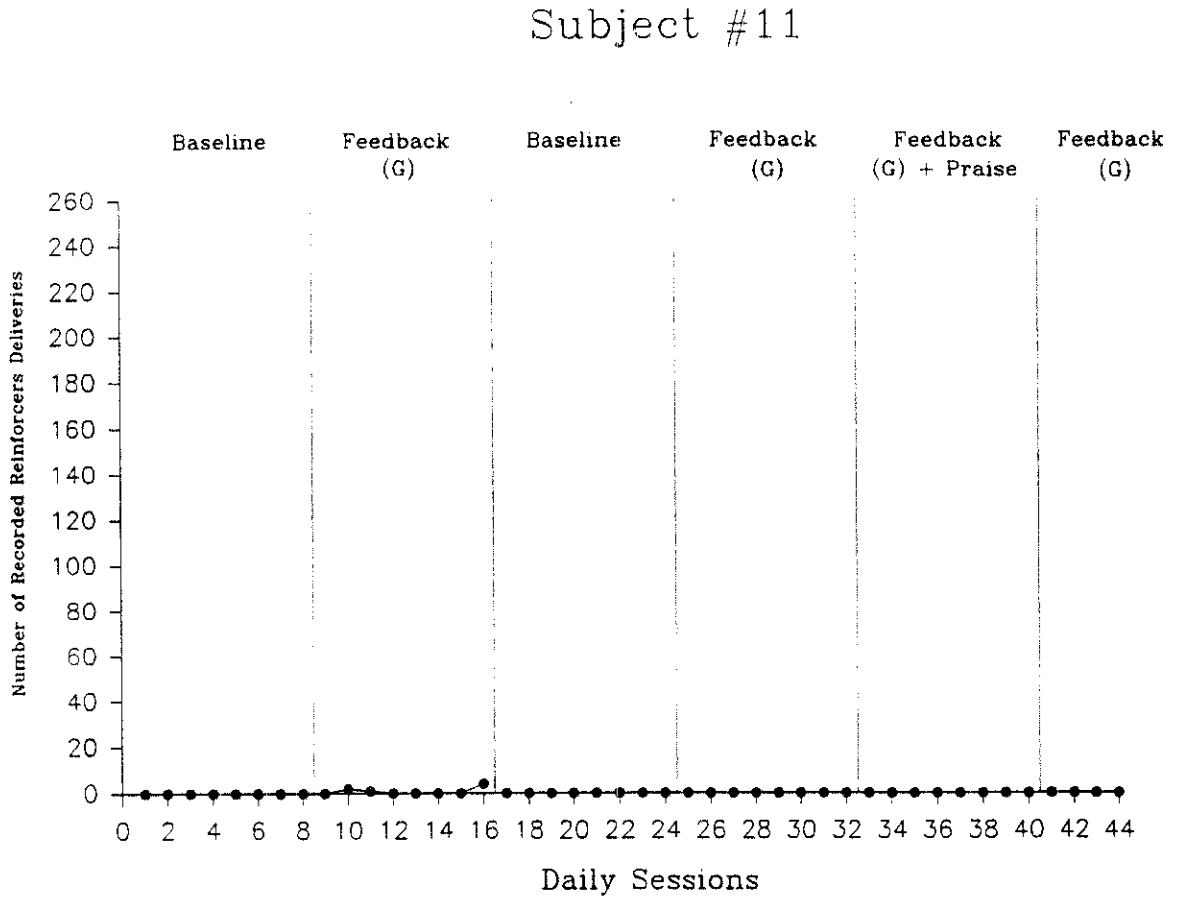


Figure 12. Total number of reinforcer deliveries recorded per session by Subject 12

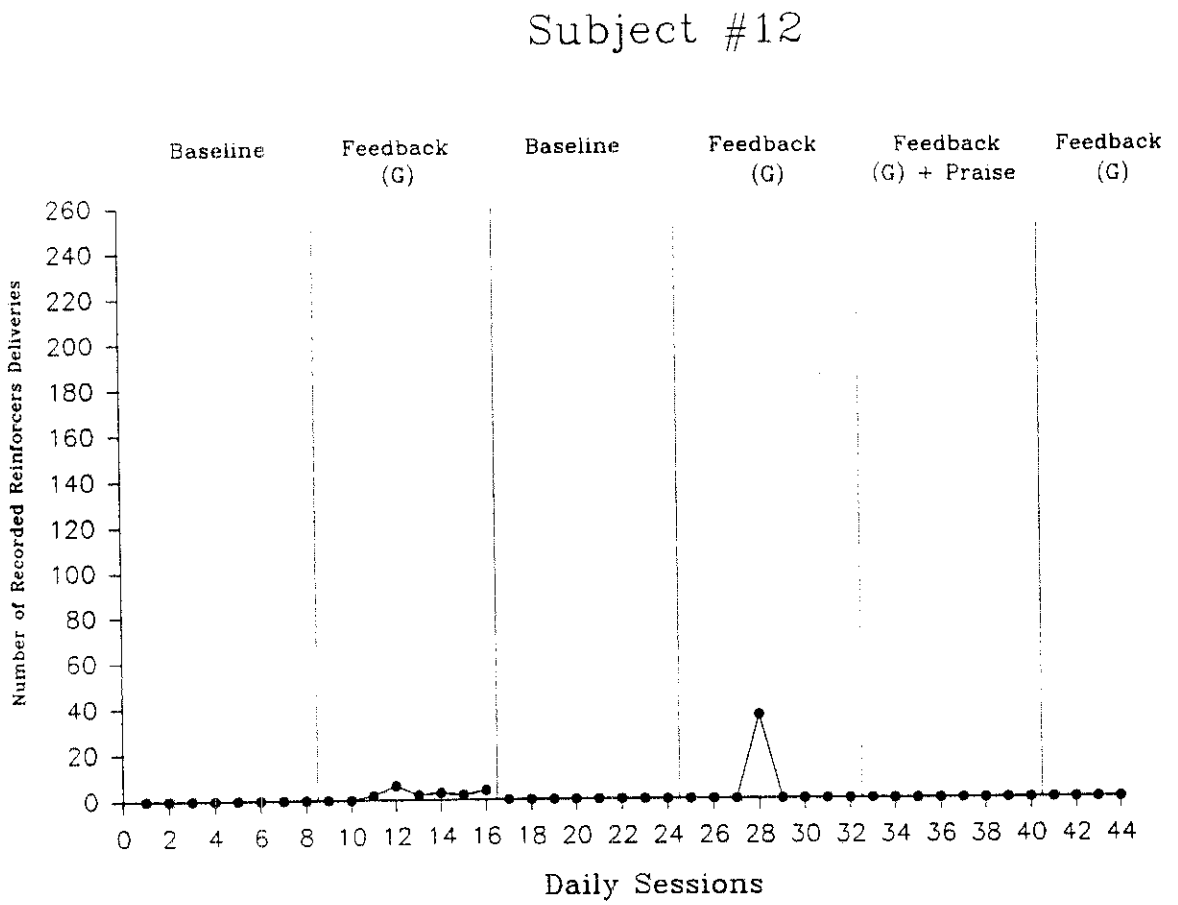


Figure 1A. Total number of problem behaviors recorded per session by Subject 1

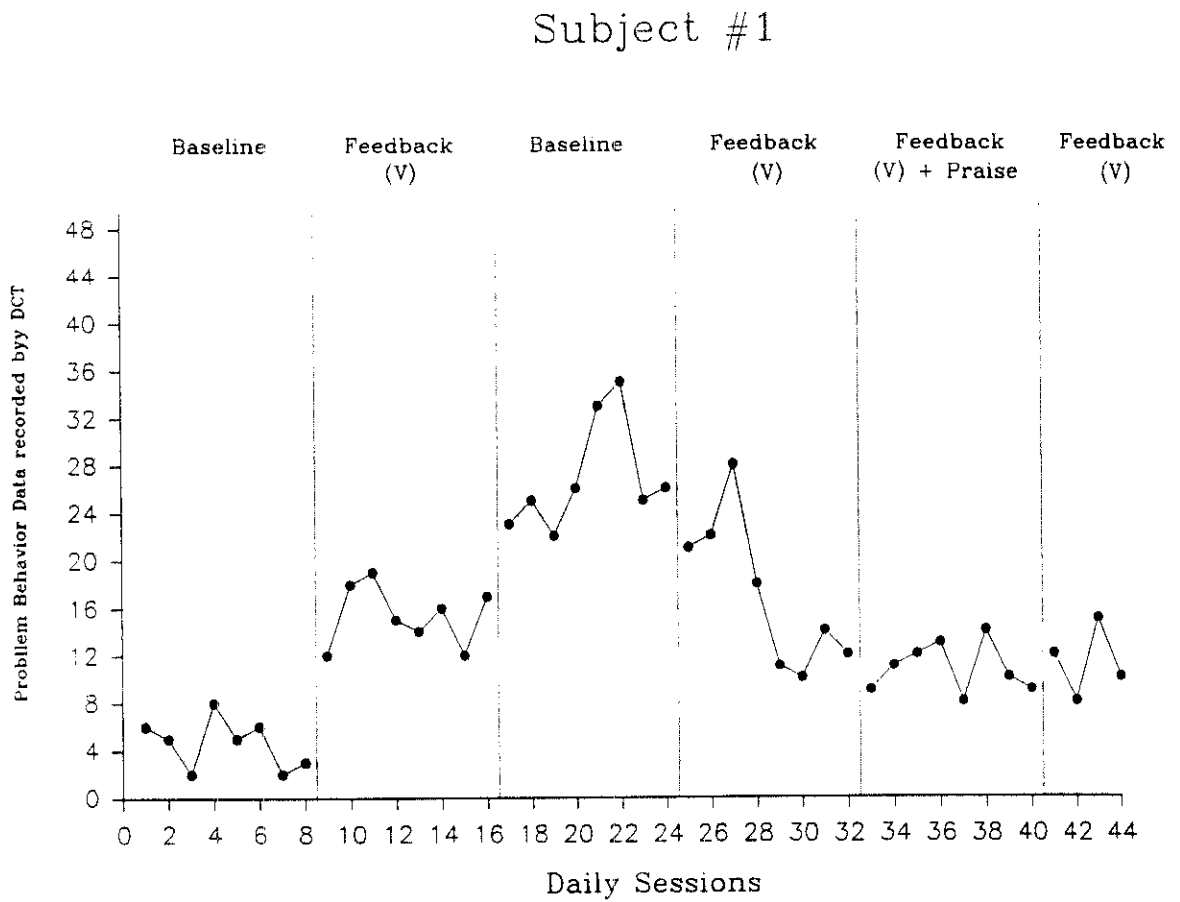


Figure 2A. Total number of problem behaviors recorded per session by Subject 6

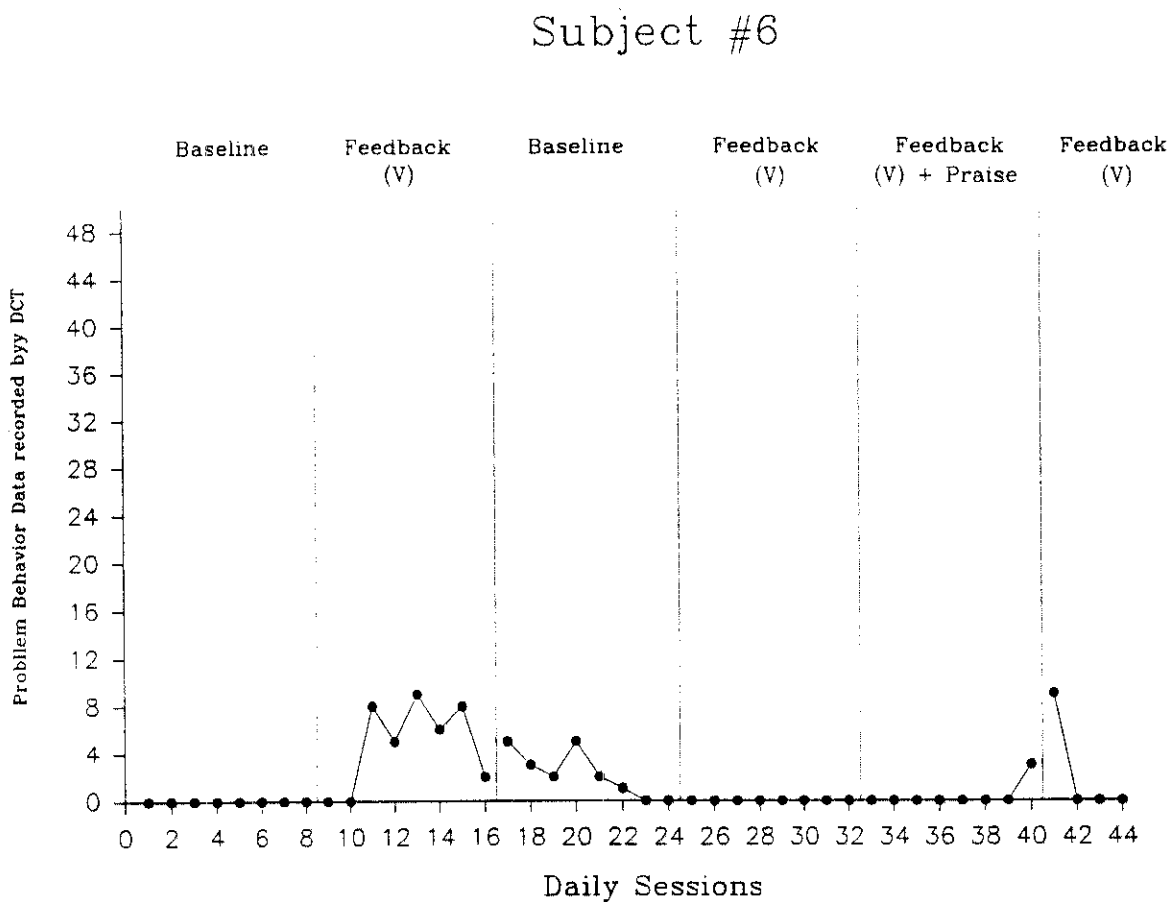


Figure 3A. Total number of problem behaviors recorded per session by Subject 7

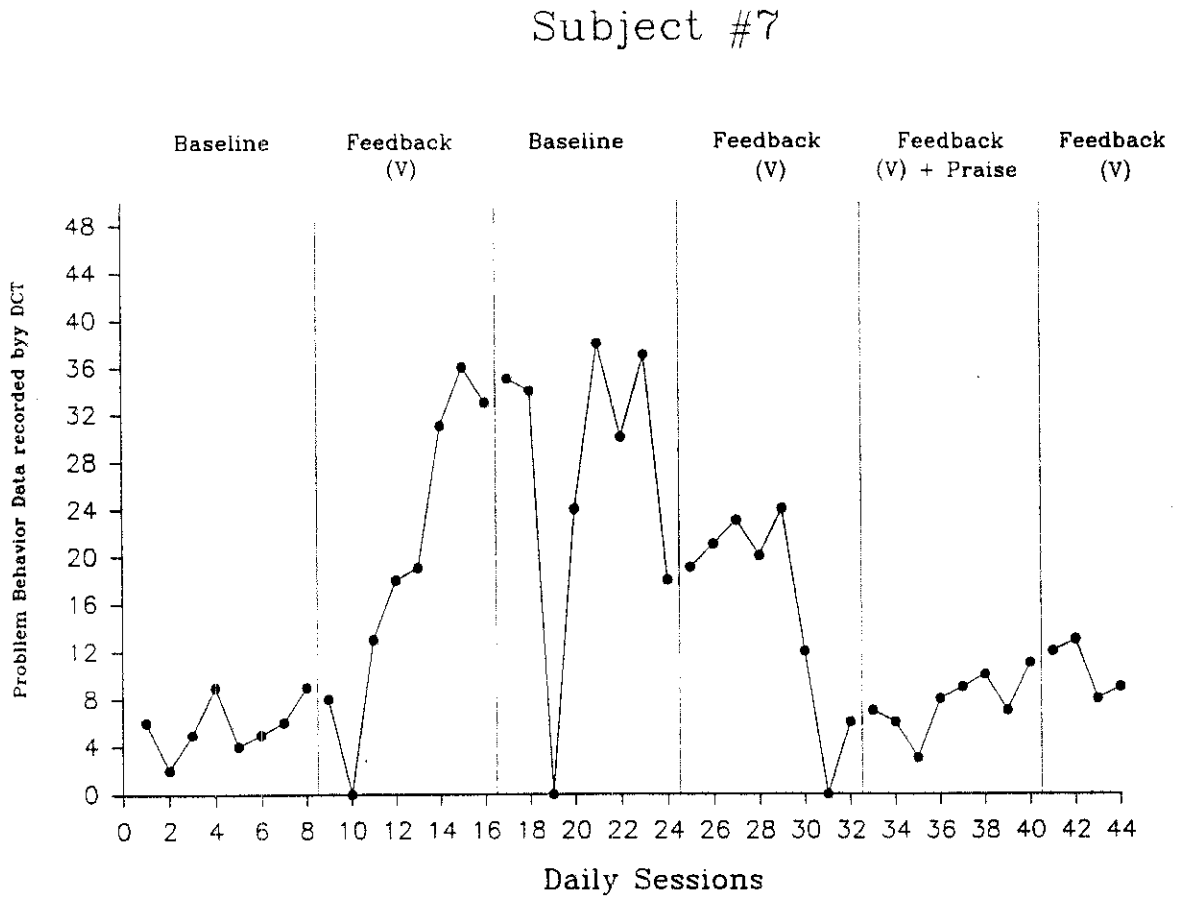


Figure 4A. Total number of problem behaviors recorded per session by Subject 4

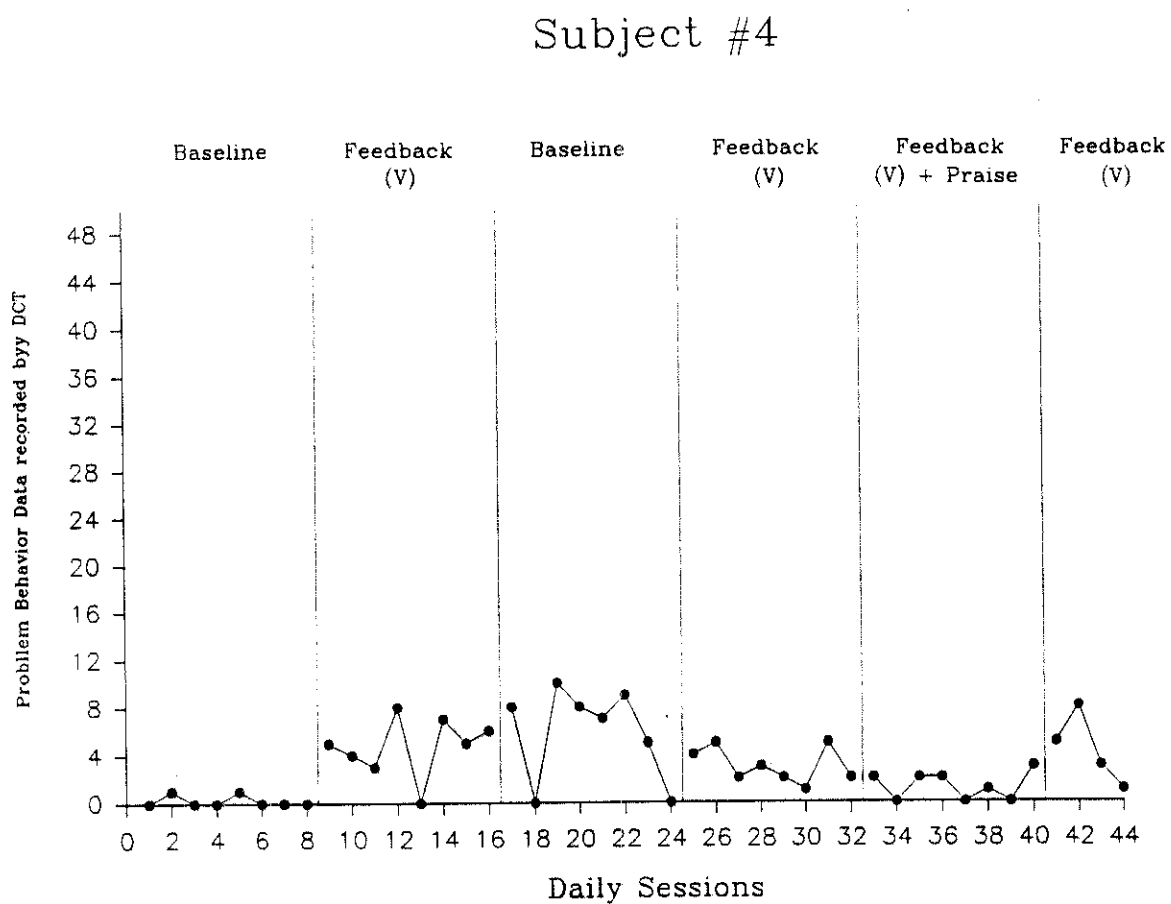


Figure 5A. Total number of problem behaviors recorded per session by Subject 5

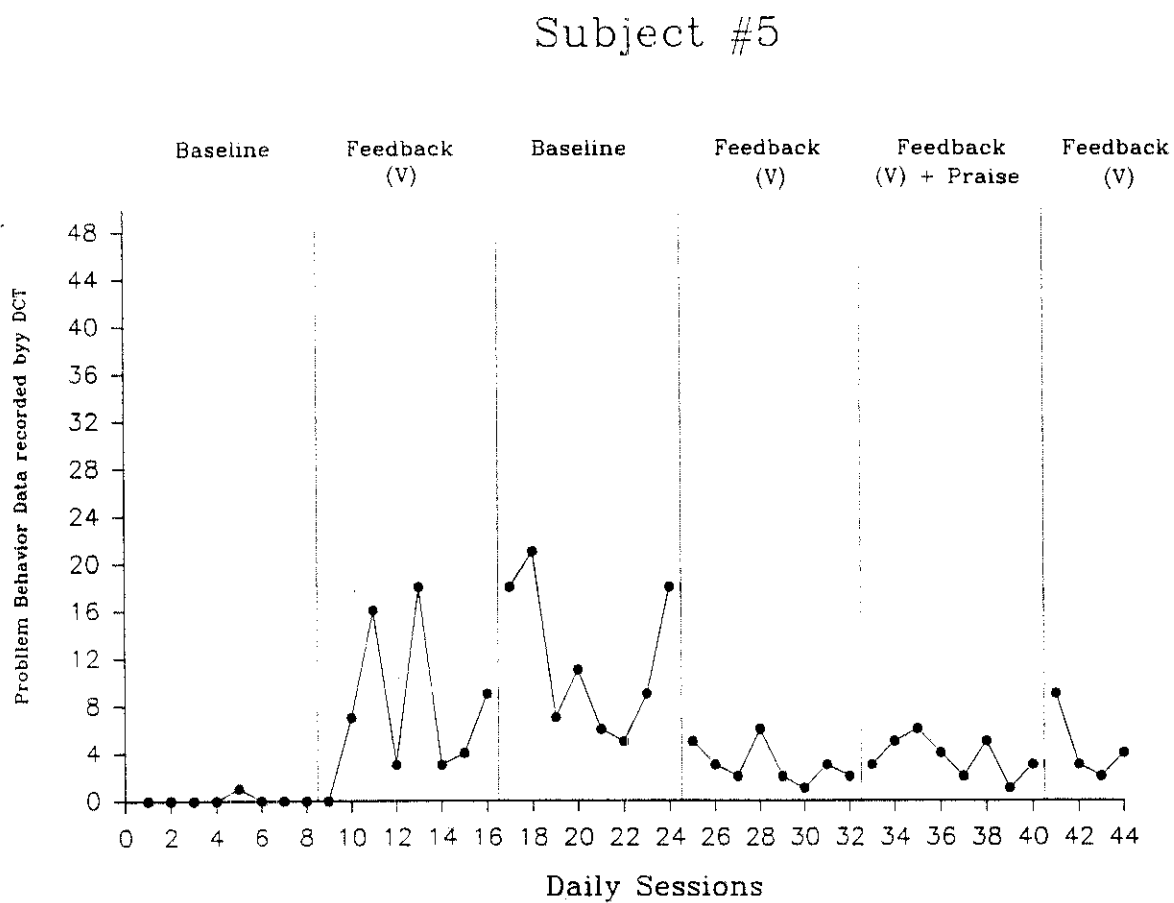


Figure 6A. Total number of problem behaviors recorded per session by Subject 9

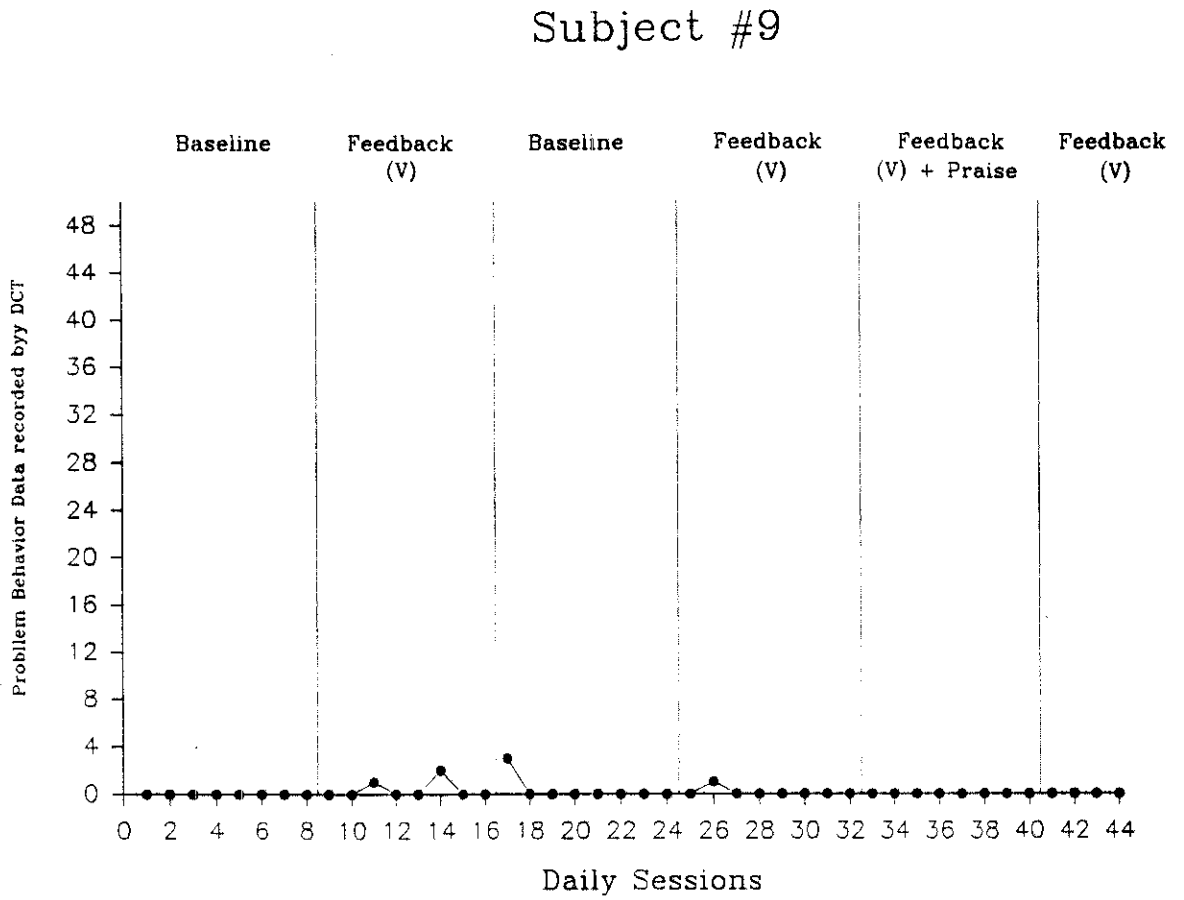


Figure 7A. Total number of problem behaviors recorded per session by Subject 3

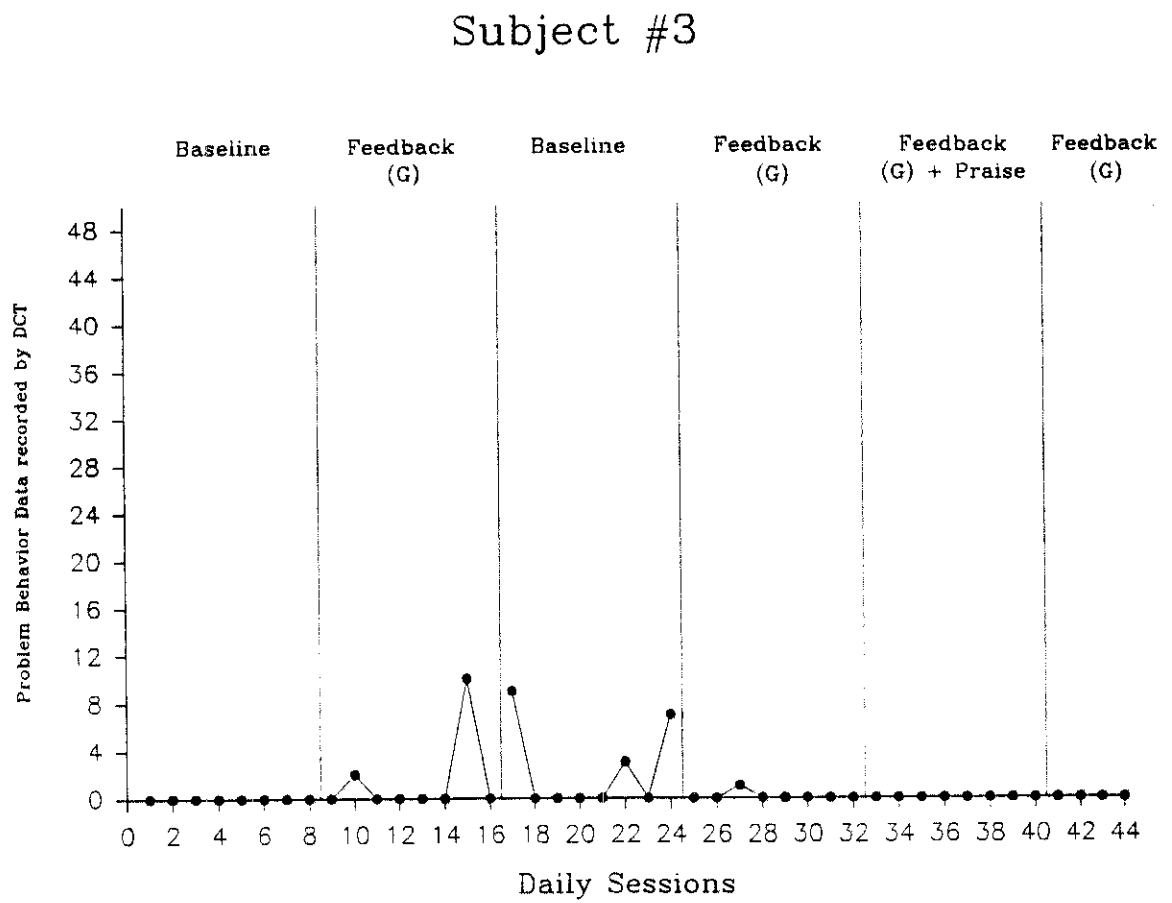


Figure 8A. Total number of problem behaviors recorded per session by Subject 8

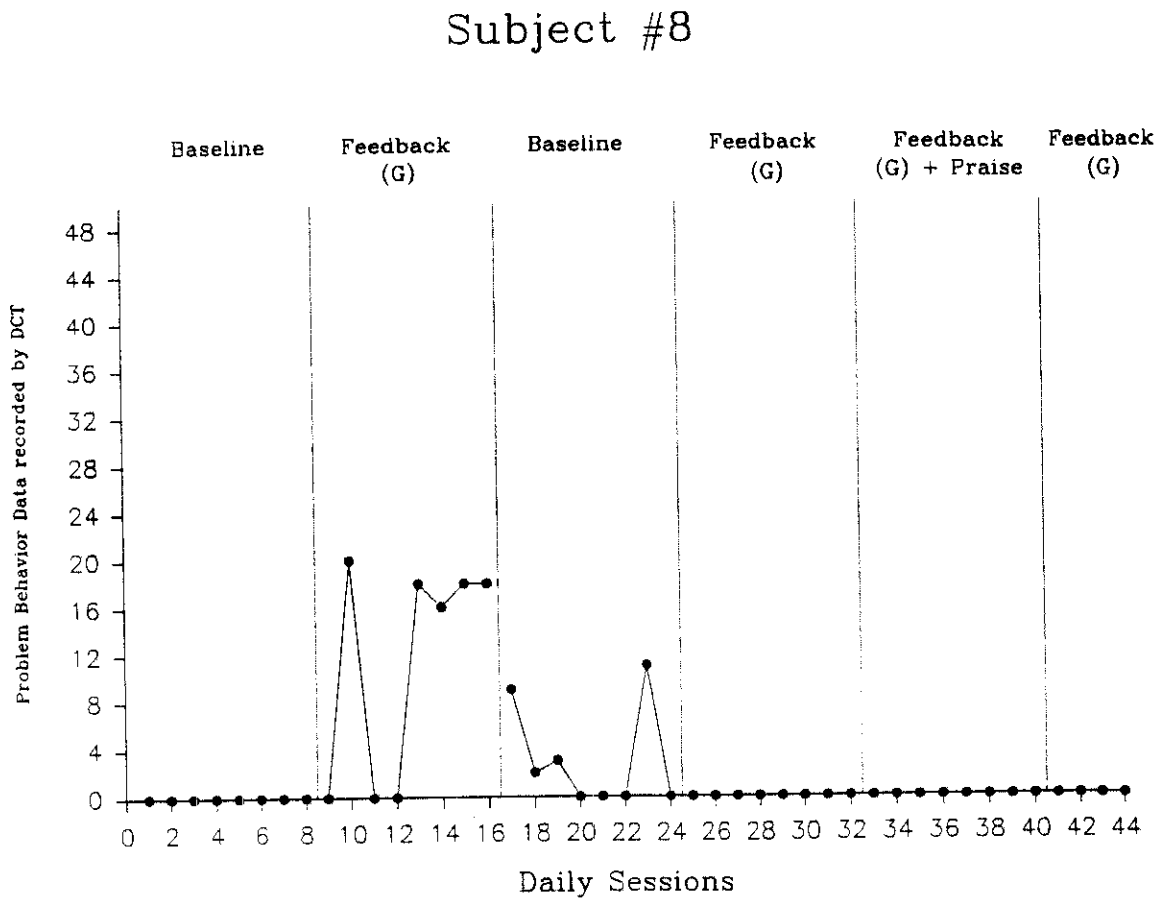


Figure 9A. Total number of problem behaviors recorded per session by Subject 2

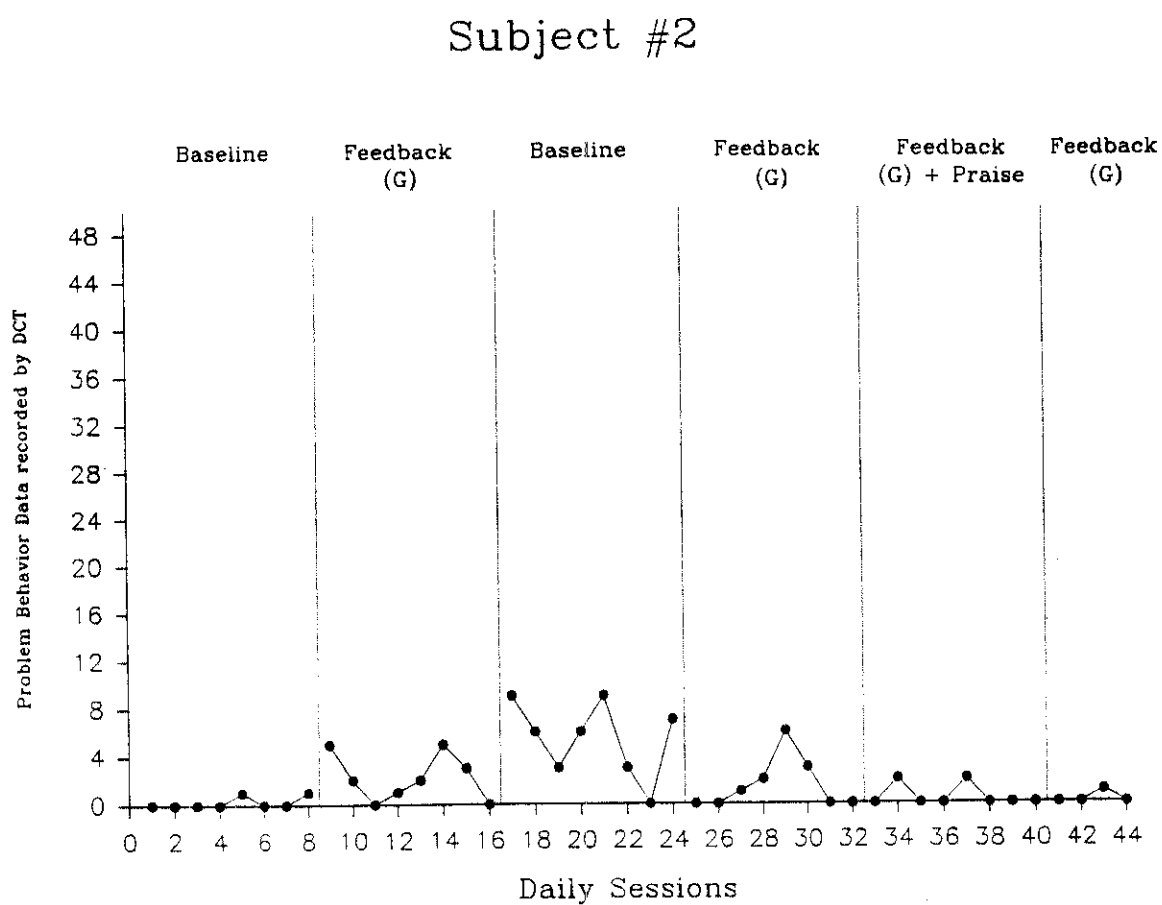


Figure 10A. Total number of problem behaviors recorded per session by Subject 10

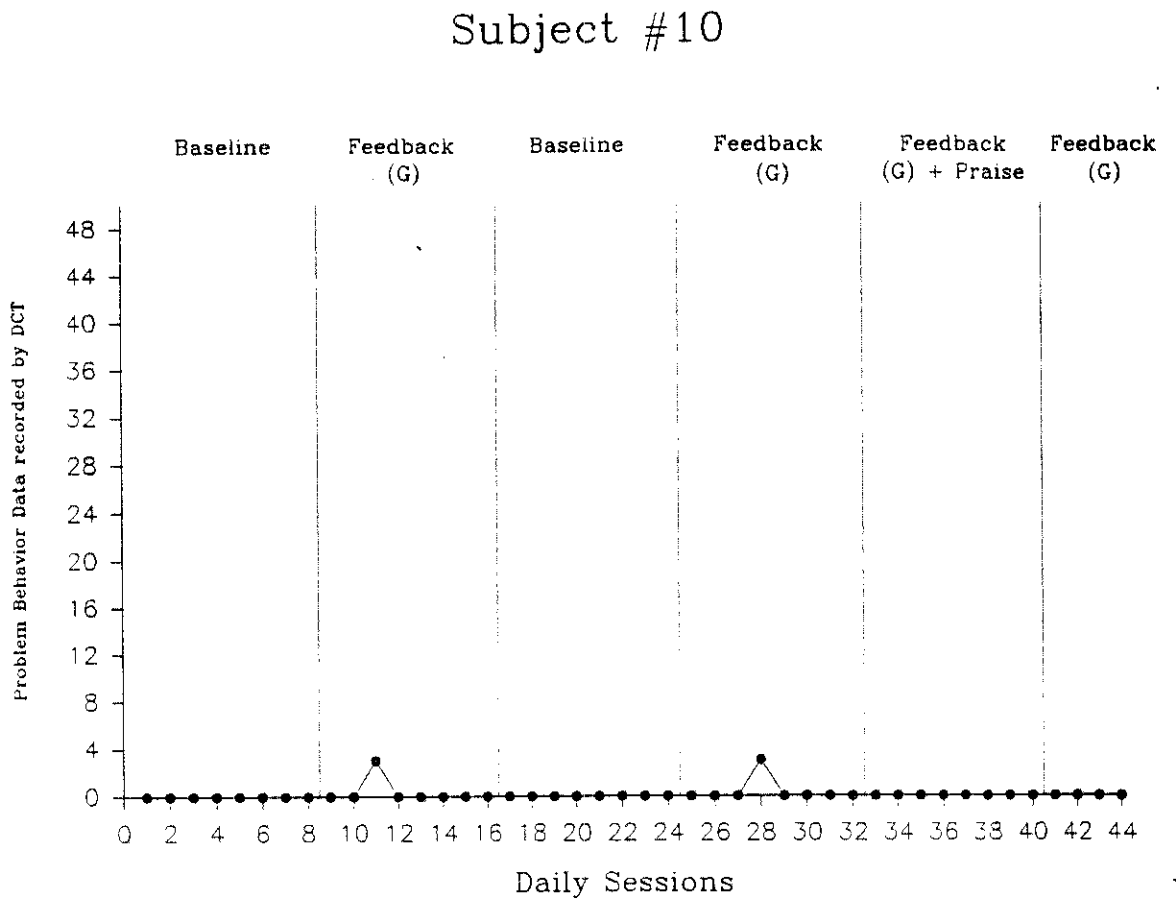


Figure 11A. Total number of problem behaviors recorded per session by Subject 11

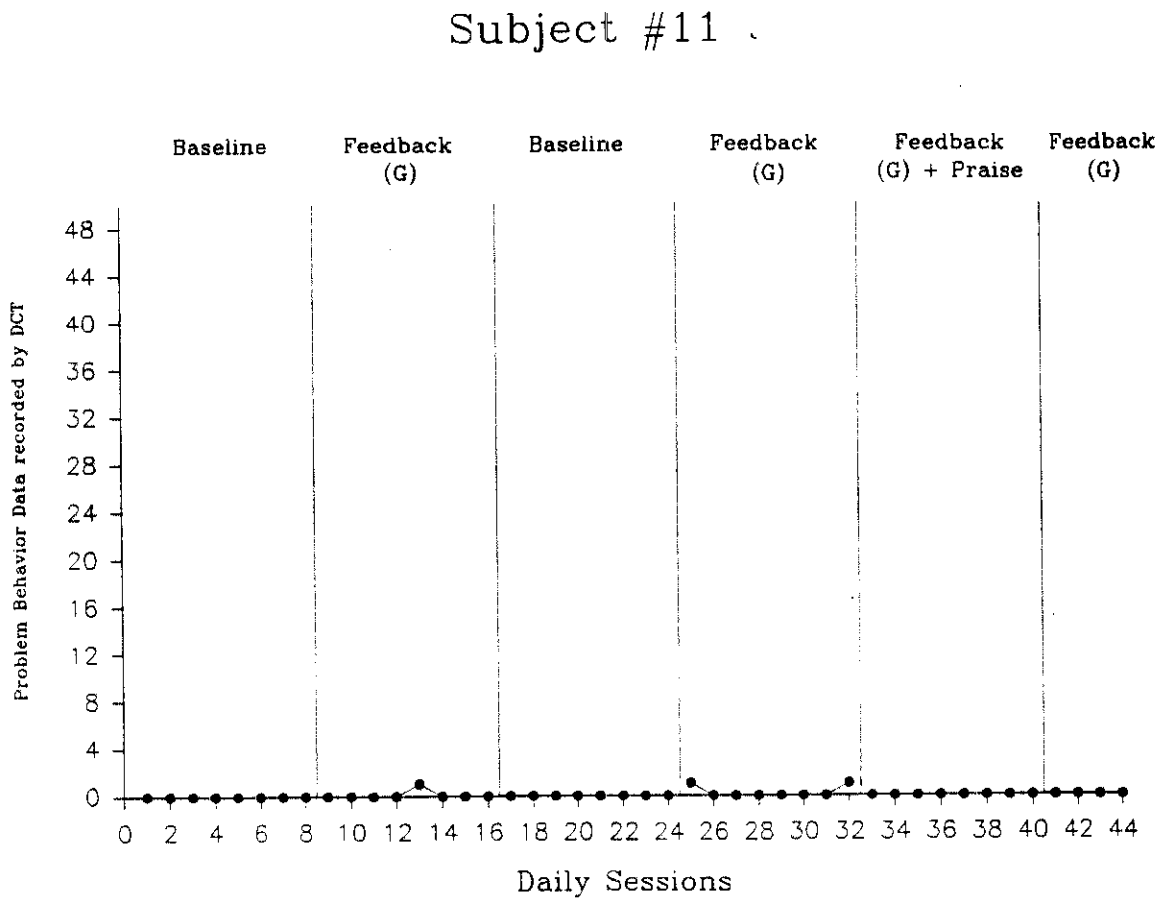


Figure 12A. Total number of problem behaviors recorded per session by Subject 12

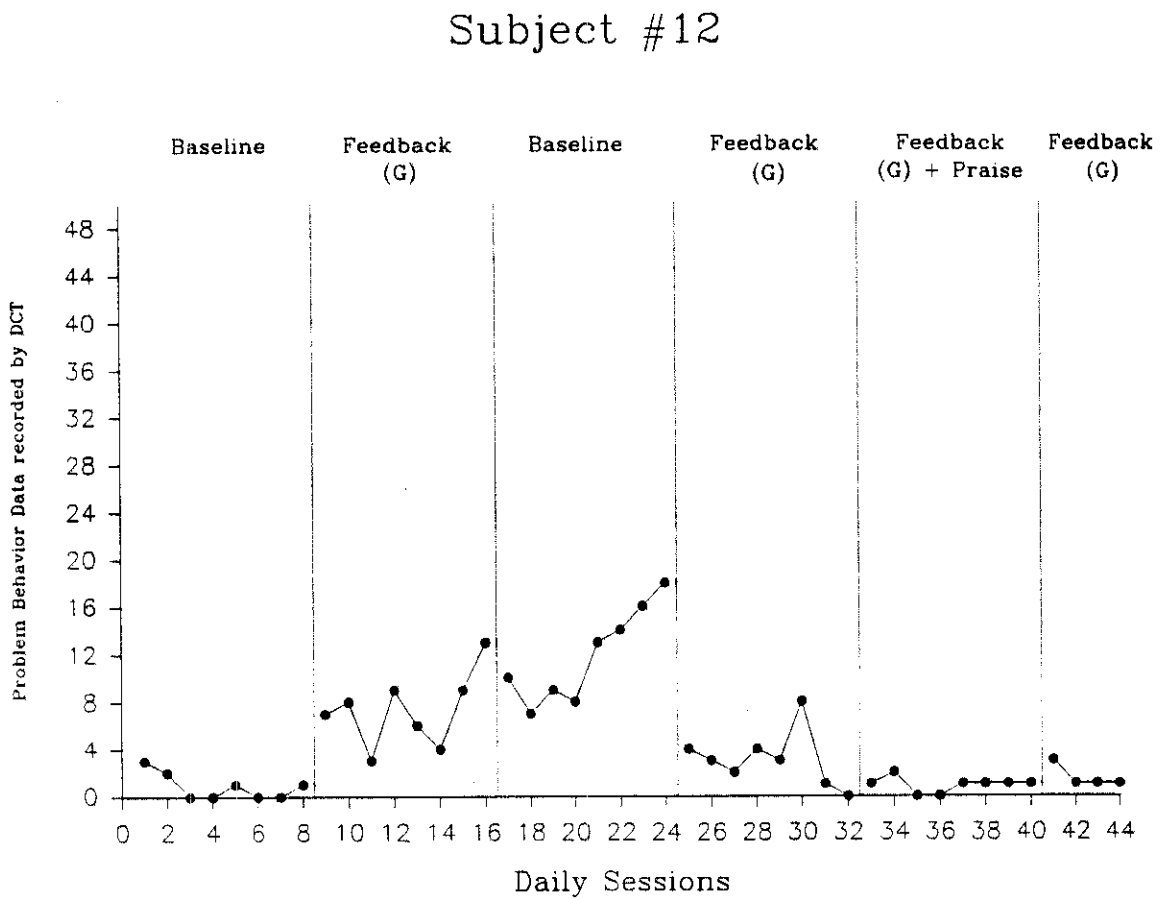
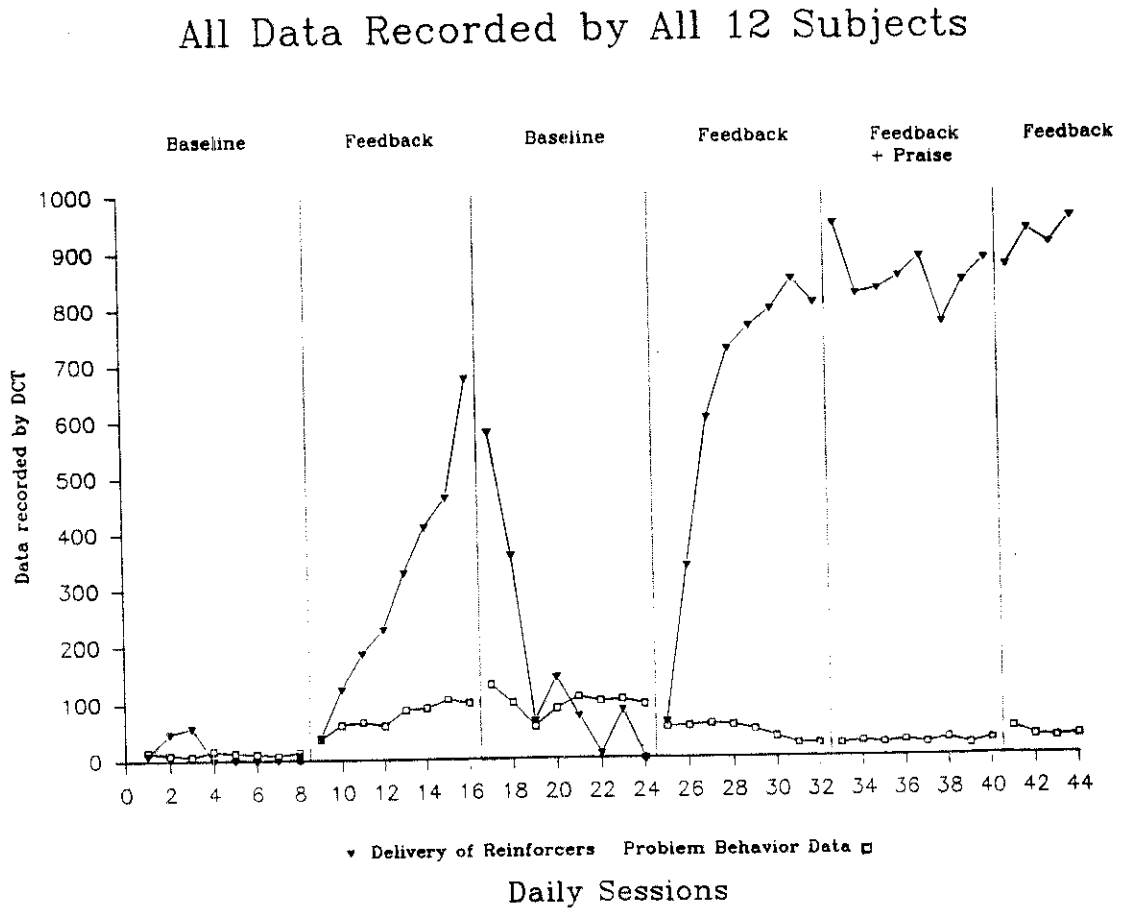


Figure 13. Total number of reinforcers and problem behaviors recorded per session by all 12 subjects



APPENDIX D
POST-EXPERIMENTAL QUESTIONNAIRE

We have been trying out a new data collection system on this apartment. We need some information from you about its use.

1. Did you find the small yellow and white cards helpful?
2. Did you find the small yellow and white cards a hinderance?
3. Would you say there was no difference in using the small cards as opposed to the larger cards usually used?
4. What problems did you have with using the small yellow or white cards.
5. Did the Behavior Therapist report to you daily the number of data you recorded the previous day?
6. How did you feel about the Behavior Therapist reporting to you your data recording-behavior.
7. Did you always record data of some type during your shift?
8. If you did why? If you did not, why?

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