A PRELIMINARY EVALUATION OF A HUMAN SERVICE DELIVERY SIMULATION

By

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Abstract

The present study consists of two experiments designed to assess whether a human service delivery simulation would reproduce common staff management findings. The simulation involved a laboratory preparation with college students serving as staff implementing a procedure to maintain discriminated lever pressing by mice. Experiment 1 reproduced the temporary increase in correct implementation with a staff training program. Experiment 2 reproduced high levels of correct implementation with a staff management program of performance pay. In addition, both experiments reproduced the low levels of correct implementation in the absence of staff training and staff management. Reproducing these three common findings suggests that introducing novel procedures under this preparation would predict similar effects in an actual human service setting.

Managing correct and consistent service delivery performances among direct-care staff has been an issue of concern in human services (Green, Reid, Perkins, & Gardner, 1991; Panyan, Boozer, & Morris, 1970; Reid & Parsons, 2000; Ricciardi, 2005). This issue is concerning because those served are often dependent upon direct staff for the delivery of various treatment services (Reid, 2004). These services range along a continuum from providing basic health care (e.g., Ducharme & Feldman, 1992; Edwards & Bergman, 1982) to implementing intricate training regimens (e.g., Greene, Willis, Levy, & Bailey, 1978; see Neef, 1995). Often, however, most staff receive little or no professional training to prepare them to provide such services proficiently (Burch, Reiss, & Bailey, 1987; Parsons, Reid, & Green, 1996; Wood, Luiselli, & Harchik, 2007). In addition to the lack of training, most staff typically work alone with little or no direct supervision (Harchik & Campbell, 1998; Reid & Parsons, 2000). The literature documents (e.g., see Kuhn, Lerman, & Vorndran, 2003; Williams & Lloyd, 1992) that the correct and consistent delivery of effective treatments are crucial to the individual served. Often, though, these services are provided incorrectly or inconsistently on a day-to-day basis (Parsons, Reid, & Green, 1993). As a result, those served are denied potential benefits that the services have to offer. Therefore, interventions designed to improve staff service delivery performances through effective training and management programs represent a socially important area for research and application.

Existing applied studies of staff management in human services have resulted in the development of interventions for improving a wide range of staff performances (for a review, see Reid, 1998). However, conducting research in naturally occurring settings often presents challenges due to both logistical constraints and ethical considerations (Everett, Studer, & Douglas, 1978). Logistical constraints include, for example, such organizational and economical factors as the (a) difficulty of gaining entry into a suitable applied setting, (b) range of experimental contingencies that can be manipulated, and (c) expenditure of time and money (Harchik & Campbell, 1998). Moreover, ethical considerations arise with regard to conducting research on the application of various, often novel interventions. For example, such interventions can potentially (a) deny those served of alternative effective treatments or (b) expose them to procedures that produce adverse effects (Green, 1999; Van Houten et al., 1988). Both logistical and ethical factors likely impede the development of innovative staff management interventions for the improvement of socially relevant problems in human services. Complementary approaches, therefore, are warranted.

One complementary approach could entail the design of a laboratory simulation of a human service delivery situation. Such an approach might minimize the logistical and ethical challenges of conducting research in naturally occurring settings. Moreover, such an approach might further maximize a finer analysis of the variables controlling staff service delivery performances. For example, under the controlled and simplified conditions of the simulation, these variables often can be readily isolated, timed, directly monitored (Ecott & Critchfield, 2004) and evaluated more efficiently and economically (DiFonzo, Hantula, & Bordia, 1998). A human service delivery simulation, if properly conceived, designed, and assessed, might complement staff management research in the development of innovative and potentially useful interventions to solutions of existing human service delivery problems (Barrett, 1987).

Several thematic lines of laboratory simulations in areas outside of staff management in human services have been conducted. These simulations, occasioned by socially relevant problems, have demonstrated success in transferring their findings in their targeted areas. For example, such lines of research have contributed to the development of novel interventions for the improvement of (a) bus ridership among local citizens (Deslauriers & Everett, 1977; Everett et al., 1978), (b) pickup and delivery performances among truck drivers (Dickinson & Gillette, 1993; Frisch & Dickinson, 1990; LaMere, Dickinson, Henry, Henry, & Poling, 1996) and, more recently, (c) occupational safety behaviors among hospital workstation personnel (Alvero & Austin, 2004; Sasson & Austin, 2005). These examples illustrate how socially relevant problems can occasion the design of a laboratory simulation which leads to findings that contribute to the development of innovative and effective interventions (see Beal & Eubanks, 2002; Lerman, 2003; Mace & Wacker, 1994).

Despite the success of these studies, published simulation research is limited in at least two ways. One limitation is that none of these studies has targeted a human service delivery situation. Another limitation is that these studies do not report a method for assessing the probability that their findings would transfer to natural settings.

The aim of present study, therefore, was to assess whether a laboratory preparation designed to simulate a human service delivery situation would reproduce common staff management findings. The simulation involved a laboratory preparation with college students serving as staff implementing a procedure to maintain discriminated lever pressing by mice. This preparation simulates the behavior of a service delivery provider, such as a teacher, parent, or therapist maintaining the target behavior of a client such as a pupil, child, or person with developmental disabilities. Two experiments were conducted to determine whether this simulation would reproduce three common staff management findings. First, will the effect of a staff training program on the staff participant’s correct implementation of an intervention be temporary. Second, when imposed, will the effect of a staff management program of performance pay increase and maintain the staff participant’s correct implementation. Third, will the absence of staff training and performance pay result in low levels of correct implementation. Reproducing these three common findings might suggest that introducing novel procedures under this preparation would predict similar effects in an actual human service setting.

Experiment 1: Staff Training

The aim of Experiment 1 was to assess whether the effects of a staff training program (see Reid & Parsons, 1995) on staff implementation performance would be reproducible under simulated service delivery conditions. This program involved four widely used components: (a) written instruction, (b) vocal instruction, (c) performance modeling, and (d) performance feedback (see Reed & Parsons, 1995). Prior studies conducted in naturalistic settings found that similar training programs produced temporary improvements in staff performance (e.g., DiGennaro, Martens, & Kleinmann, 2007; Noell et al., 2000). A secondary aim was to determine whether staff performance would fall to low levels in the absence of direct supervisory contingencies, and thus reproduce another applied finding from the staff management literature (e.g., DiGennaro et al., 2007; Noell et al., 2000). Reproducing both effects would increase the probability that future findings under the present preparation will predict similar effects in actual human service settings.

Method

Participants and Setting

Two undergraduate students (1 female and 1 male, 20 and 24 years of age) recruited from an introductory behavior analysis course via classroom fliers and announcements served as simulated staff (Staff A and Staff B). Two female mice (approximately 5 months old at the start of the experiment) of mixed breed served as simulated clients. Each staff participant was assigned to work with a different mouse. Staff participants received a time-based pay of 20 extra-credit points (0.1% of the overall course grade) per session in exchange for their participation. All sessions approximated 20 min in duration and were conducted two times a day, five days a week. The total number of sessions was scheduled in advance, and each scheduled session time was held constant throughout the experiment.

Staff participants worked alone and at different scheduled times in a laboratory room (approximately 3 m by 5 m) located on a university campus. The laboratory housed two mice, each in a separate locked chamber. Staff participants were provided with keys to both the laboratory and to their assigned mouse chamber.

Staff participants were not told that unobtrusive observations (via a hidden web camera) of their sessions would be made. The use of the web camera permitted unobtrusive observations to capture staff performances, particularly under baseline conditions when working alone (i.e., in the absence of experimenter's presence and supervision). Additionally, staff participants were not informed about the direct purpose of the experiment. Therefore, in accordance with the university's Institutional Review Board's standards and guidelines, written informed consent was obtained from each staff participant prior to participation.

Apparatus

Two identical custom-built mouse chambers were used. Each chamber measured 26 cm wide, 61 cm long, and 28 cm high (Figure 1). Two panels divided the chamber into three separate compartments. An opaque compartment (26 cm wide, 11 cm long, and 28 cm high) located at the far left of the chamber was equipped with a digital web camera (Figure 1, A). A one-way mirror (Figure 1, B) separated this space from the chamber's center compartment (26 cm wide, 32 cm long, and 28 cm high; Figure 1, C), which housed the mouse and contained the operanda.

Fastened to the inside lower right back panel of the center compartment was a nonretractable lever (26 cm from the one-way mirror, 3 cm in width, 4.5 cm above the floor, and protruded 1.8 cm into the compartment; Figure 1, D). Mounted directly above the lever was a white, 28-volt light (2.5 cm in diameter and 5.5 cm above the lever). A Plexiglas bar (12 cm long), equipped with a metal cord (16 cm long) connected to a microswitch, was fastened to a swivel mounted on the outside top far left of the chamber (Figure 1, E). When the Plexiglas bar was positioned over the center compartment (Figure 1, F), the bottom of the metal cord hung approximately 9 cm above the floor, 8 cm from the one-way mirror, and centered 12.5 cm from both the front and back panels. Each cord pull automatically lit the lever light for 10 s.

A transparent Plexiglas panel separated the center compartment from a running-wheel compartment (26 cm wide, 18 cm long, and 28 cm high) located at the far right of the chamber (Figure 1, G). This space contained a running-wheel (17 cm in diameter and 8 cm wide), which could be manually removed from and returned to the running-wheel compartment. Access to the running-wheel could be gained through a manually operated, retractable sliding door (Figure 1, H). The door, when opened, uncovered an aperture that was approximately 5 cm in diameter (4.5 cm above the floor and 6 cm from the back panel; Figure 1, I).

An analogue clock, mounted on the outside far left panel of the chamber, served as a “session time clock” for each staff participant (Figure 1, J). The clock was wired to a microswitch that was fastened to the chamber’s lid (Figure 1, K). A white, 28-volt light (2.5 cm in diameter) was mounted directly below the clock. The clock light was programmed to turn on at the start and off at the end of each scheduled session. Only when the clock light was lit and the chamber lid was open did the clock operate. The clock light, therefore, signaled the start and the end of each session, and the time clock recorded the amount of time that each staff participant spent during his or her scheduled session.

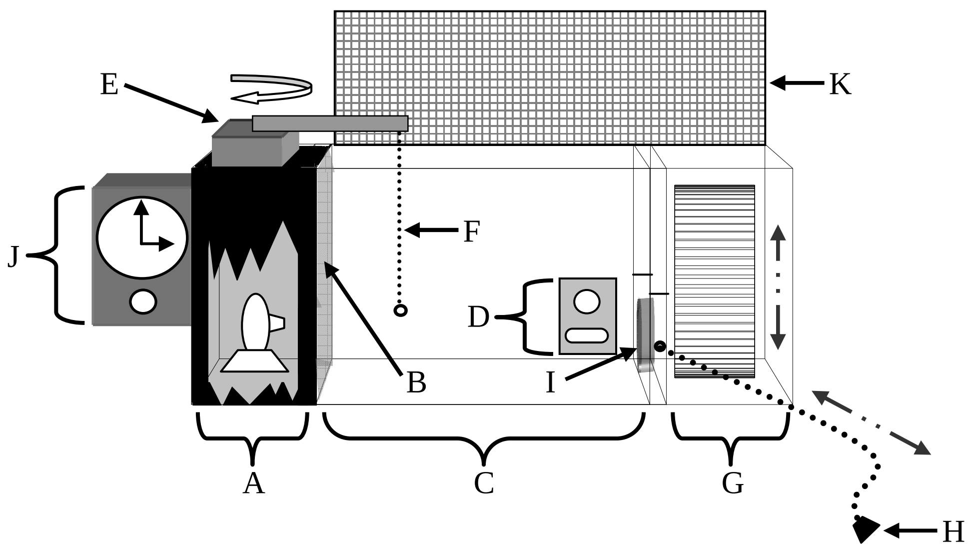

Figure 1. A schematic of the mouse chamber: (A) web camera compartment; (B) one-way mirror; (C) center compartment; (D) lever with stimulus light mounted directly above; (E) Plexiglas bar fastened to a swivel, and positioned over the center compartment; (F) metal cord; (G) running-wheel compartment with removable wheel; (H) manually operated retractable door; (I) entry to running-wheel; (J) time clock with session light mounted below; (K) chamber lid.

Observation System

Sessions were recorded unobtrusively via the web camera concealed within the mouse chamber. The camera recorded all features of the dependent measure described below. A microswitch fastened to the lid of the chamber started video recordings when the lid was opened and stopped recordings when the lid was closed. In addition to video recordings, a microswitch attached to the lever in the center compartment produced simultaneous digital still images of lever presses in real time. Video recordings and still images were automatically dated, timed, and saved to a computer in an adjacent room.

Measurement

The total number of correct trials implemented by each staff participant within a 15-min session served as the dependent measure. Each session started when the staff participant positioned the Plexiglas bar over the center compartment of the chamber so that the metal cord was available to the mouse. A trial was scored as correct if the following sequences of components in a *chained fixed-ratio (FR) 1 FR2 limited hold 10-s schedule* occurred (hereafter referred to as a “chained schedule”). With the mouse in the center compartment of the chamber, and with the lever light off, the staff participant (a) waited until the mouse pulled the metal cord, which automatically lit the lever light for 10 s; (b) waited for the mouse to complete two consecutive lever presses while the lever light was lit; (c) opened the retractable door to the running-wheel compartment; (d) waited for the mouse to enter the running-wheel; (e) closed the retractable door; (f) allowed the mouse running-wheel access for at least 5 s; (g) removed the running-wheel, with the mouse inside, from the running-wheel compartment; (h) placed the running-wheel in the center compartment; (i) waited for the mouse to exit the running-wheel; and, lastly, (j) returned the wheel back to the running-wheel compartment. Each session ended after 15 min or when the participant repositioned the Plexiglas bar out of the center compartment of the chamber so that the metal cord was no longer available to the mouse, whichever occurred first. Again, all features of the dependent measure were recorded via the web camera concealed within the chamber.

Interobserver Agreement

Interobserver agreement was assessed by having a second observer independently score a minimum of 40.0% of the video recorded sessions within each condition for each staff participant. Observers' scoring records were compared on a trial-by-trial basis. An agreement was defined as an occurrence in which both observers scored whether or not a trial was correctly implemented. Agreement percentages were calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100%. Overall agreement between observers was 100%.

Procedure

Overview. Mice were trained by the experimenter to respond on the chained schedule before the start of the experiment. The training procedures were generally similar to those described by Michael (1963). Training remained in effect until responding was reliably established under the chained schedule for a minimum of 10 consecutive, 15-min sessions of 15 or more trials per session. After the training criterion was met, each staff participant was assigned to work with a different trained mouse.

Staff participants received an instruction manual prior to their first session (Appendix A). The manual described the apparatus and provided instructions on how to implement the chained schedule procedure. Additionally, the manual specified the session and task responsibilities. Specifically, it stated that the staff participant was requested to train the mouse for 15 min during each session and implement at least 15 correct trials. Following mastery (i.e., 100% correct) on a multiple-choice quiz over the manual (Appendix B), the experimenter met individually with each staff participant for a general orientation. During orientation, the experimenter (a) greeted the staff participant and escorted him or her to the laboratory room, (b) provided the staff participant with keys to both the laboratory and to his or her assigned mouse chamber, (c) reiterated the material described in the instruction manual, (d) illustrated how to operate the mouse chamber, and (e) demonstrated one correctly implemented trial.

Initial baseline. Following the general orientation, the staff participant was left to work alone (i.e., in the absence of the experimenter's presence, supervision, and other staff participants) to implement the chain schedule procedure, as outlined in the instruction manual and described during the orientation. (It should be noted that exposure to the manual and orientation prior to this condition precluded an assessment of naïve implementation performance. However, such performance was considered uninformative, because it is unlikely that the staff participant would correctly implement the chained schedule procedure without any prior information whatsoever.) The next condition was introduced after a minimum of 4 sessions had been conducted and implementation performance was low and generally stable.

Staff training. In this condition, the experimenter arrived at the laboratory unannounced and the staff training program (see Reid & Parsons, 1995) was introduced. Specifically, the experimenter (a) reiterated the session and task responsibilities (i.e., vocal instruction), (b) demonstrated a correctly implemented trial (i.e., performance modeling), (c) observed the staff participant's implementation performance, and (d) provided corrective and approving feedback (i.e., performance feedback) on his or her performance. The experimenter's presence and supervision remained in effect until implementation performance was reliably established for 3 consecutive sessions of 15 or more correct trials per session.

Implementation baseline. During this condition, the staff participant was left to work alone to implement the chained schedule procedure in the absence of the experimenter's presence and supervision.

Experimental Design

Experiment 1 used a multiple baseline design to assess the effects of the staff training program on staff participants' correct implementation of the chained schedule procedure. Both staff participants were first exposed to the initial baseline condition. The staff training program was then introduced at different times for Staff A and Staff B. Following staff training, the implementation baseline condition was instated for both staff participants for the remaining sessions of the experiment.

Results and Discussion

Figure 2 shows the effects of the staff training program on each staff participant's correct implementation of the chained schedule procedure. During the initial baseline condition, both staff participants exhibited low levels of correct implementation (M = 1.4 trials). In the staff training condition, an overall increase in implementation was observed (M = 14.0 trials), with the last three sessions meeting the requested 15 trials per session. A reversal back to baseline revealed a general decrease in the levels of correct implementation (M = 8.7 trials).

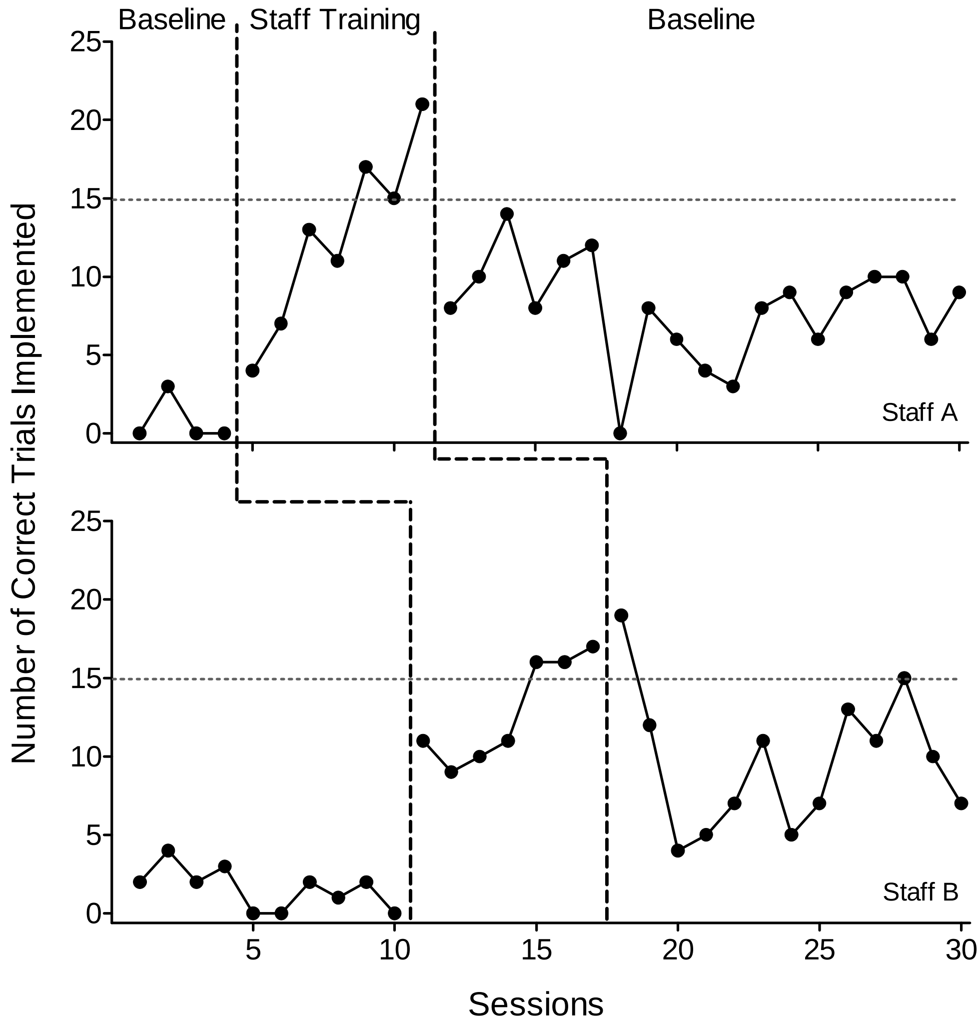

Figure 2. The number of correct trials implemented by Staff A and Staff B during baseline and staff training conditions. The horizontal dashed line on each panel represents the minimum number of correct trials requested of each staff participant.

In summary, Experiment 1 examined the effects of staff training on staff participants' correct implementation of the chained schedule procedure. Overall, the staff training condition resulted in higher levels of correct implementation than during baseline conditions. In addition, the return to baseline after training resulted in a decrease below the requested 15 trials per session. The results, therefore, showed that correct implementation of the chained schedule procedure improved as a result of the staff training condition. Furthermore, the results showed that the effects of staff training were temporary.

Experiment 2: Staff Management

The aim of Experiment 2 was to assess whether the effects of a staff management program of performance pay (see Stajkovic & Luthans, 2001) on staff implementation performance would be reproducible under simulated service delivery conditions. This program involved providing incentives contingent on improvements in staff performance (see Reed & Parsons, 1995). Prior studies have found that performance-incentive programs, when imposed, produced improvements in staff performance (e.g., Cook & Dixon, 2005; George & Hopkins, 1989). As in Experiment 1, a secondary aim was to determine whether staff performance would fall to low levels in the absence of the imposed contingencies. Reproducing both effects would increase the probability that future findings under the present preparation will predict similar effects in actual human service settings.

Method

Participants, Setting, Apparatus, Measurement, and Observation System.

Three undergraduate students (1 female and 2 males, between 18 and 37 years of age) served as simulated staff (Staff C, Staff D, and Staff E). Three female mice (approximately 5 months old at the start of the experiment) of mixed breed served as simulated clients. Other details, including course extra-credit, session schedule and length, informed consent, setting, apparatus, measurement, and observation system, were identical to those described in Experiment 1.

Interobserver Agreement

A second observer independently scored a minimum of 33.3% of the video recorded sessions within each condition for each staff participant. Agreement percentages were calculated as described in Experiment 1. Overall agreement between observers was 100%.

Procedure

Procedures were similar to those described in Experiment 1, except for the exclusion of the initial baseline in the sequence of experimental conditions and for the introduction of an additional condition called performance pay.

Performance pay. In conjunction with time-based pay of 20 extra-credit points per session, the staff management program of performance pay was introduced for Staff D and Staff E. During this condition, the experimenter arrived at the laboratory unannounced and offered the staff participant one extra-credit point for each trial correctly implemented within the session. The experimenter provided no corrective or approving feedback, as during the staff training condition, other than the presentation of performance extra-credit points. Experimenter's presence and the performance pay contingency remained in effect until the staff participant correctly implemented 15 or more trials per session for at least 4 consecutive sessions.

Experimental Design

The effects of performance pay on correct implementation of the chained schedule procedure were evaluated with a different experimental design for each staff participant. All staff participants were first exposed to the staff training condition. Following staff training, the implementation baseline condition was introduced. Staff C continued in this condition to determine the effect of an extended baseline following training in an AB design. After training and baseline, Staff D was exposed to performance pay and a return to baseline in an ABCB design. After training, baseline, performance pay and return to baseline, Staff E was again exposed to performance pay, a return to baseline, and finally a return to performance pay in an ABCBC design.

Results and Discussion

Figure 3 shows the results for each staff participant. During the staff training condition, all staff participants exhibited high levels of correct implementation (M = 18.0 trials). Following staff training, an overall decrease in the levels of correct implementation was observed (M = 7.7 trials) with the extended baseline for Staff C resulting in zero correctly implemented trials during the last six sessions of the condition. For Staff D and Staff E, instituting the performance pay condition showed an immediate increase in the levels of correct implementation (M = 18.4 trials). Upon discontinuing performance pay, both staff participants' correct implementation returned to levels similar to those observed during the previous baseline condition (M = 5.1 trials). When reintroducing the performance pay contingency for Staff E, high levels of correct implementation was observed for the remaining sessions of the experiment (M = 17.0 trials).

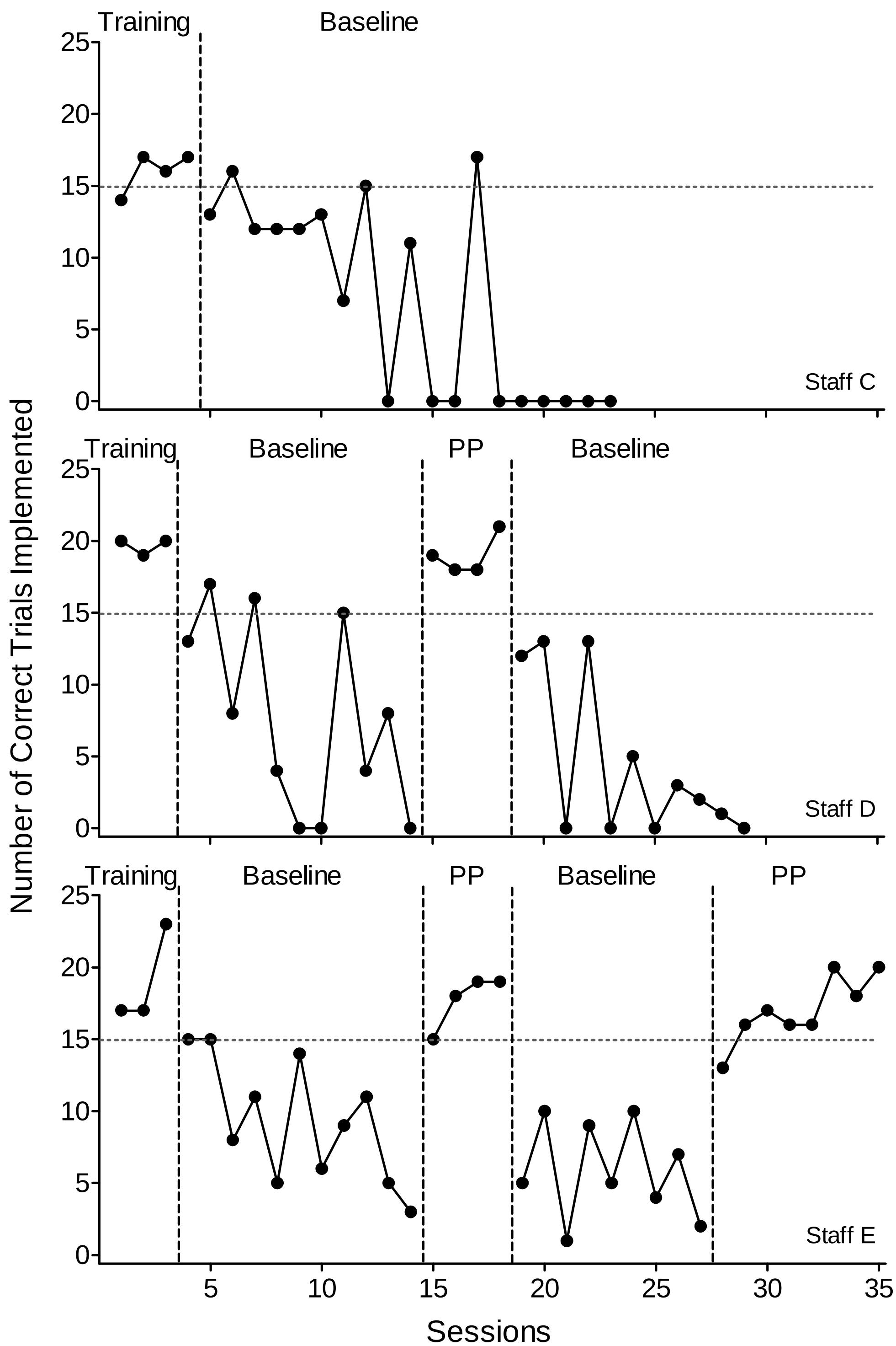
Training
Baseline
Staff C
Training
Baseline
PP
Baseline
Staff D
Training
Baseline
PP
Baseline
PP
Staff E
Number of Correct Trials Implemented
Sessions
0
5
10
15
20
25
5
10
15
20
25
30
35

Figure 3. The number of correct trials implemented by Staff C, Staff D, and Staff E during staff training (Training), baseline, and performance pay (PP) conditions. The horizontal dashed line on each panel represents the minimum number of correct trials requested of each staff participant.

In summary, Experiment 2 examined the effects of performance pay on staff participants' correct implementation of the chained scheduled procedure. Overall, during the baseline conditions, the levels of correct implementation were initially high but rapidly decreased. For Staff C, the results showed a decrease to very low levels during an extended baseline following training. For Staff D and Staff E, the performance-pay condition resulted in high and consistent levels of correct implementation with a rapid reduction to baseline levels when the condition was terminated. The results, therefore, showed that correct implementation of the chained schedule procedure improved as a result of the performance pay condition.

General Discussion

The present study assessed whether a laboratory preparation designed to simulate a human service delivery situation would reproduce common staff management findings. Toward this end, two systematic replications of established staff training and management procedures were conducted. These systematic replications reproduced three characteristic staff management findings.

Experiment 1 systematically replicated the procedures of a widely used staff training program that involved (a) written instruction, (b) vocal instruction, (c) performance modeling, and (d) performance feedback (see Reed & Parsons, 1995).

Under the present preparation, the combination of these procedural components was demonstrably effective in teaching staff participants the necessary requisites to implement the chained schedule procedure with a relatively high degree of accuracy. This reproducible staff training finding is consistent with those reported in research conducted on staff performance in naturalistic settings (e.g., Demchak, 1987).

Experiment 2 systematically replicated the procedures of a staff management program that involved providing incentives contingent upon improvements in work performance (see Reed & Parsons, 1995). Under the present preparation, this program generated high levels of correct implementation among trained staff participants. This reproducible staff management finding is also consistent with those reported in research conducted on staff performance in naturalistic settings, such as in industry (e.g., George & Hopkins, 1989) and in human services (e.g., Cook & Dixon, 2005).

Both Experiment 1 and Experiment 2 reproduced low levels of staff implementation performances in the absence of imposed staff training and management procedures. Several studies have reported similar baseline findings in naturalistic settings (e.g., DiGennaro et al., 2007; Noell et al., 2000; Witt, Noell, LaFleur, & Mortenson, 1997).

Sidman (1960) suggested the use of systematic replications as a methodology for assessing the adequacy of a laboratory preparation. The assessment requires the experimenter to program a well-studied procedure to determine if the characteristic behavior occurs under a new preparation. If it does, proceed; if not, revise the preparation until the characteristic behavior occurs (Zeiler, 1984). The present study used this method to assess the laboratory preparation. After several test-and-revise cycles with prior participants and procedural variations, the resulting laboratory preparation reproduced findings similar to those reported in applied research conducted on staff management in naturalistic settings. Specifically, the present study reproduced (a) high levels of correct implementation by replicating state-of-art behavior-analytic based staff training and management procedures and (b) low levels of correct implementation under baseline conditions in the absence of staff training and management. These results suggest that the present preparation may produce findings with novel interventions which would likely predict similar effects in actual human service settings.

In considering these reproducible findings, however, the present study is limited in at least four ways. One limitation was the failure to control for the potential influence that the experimenter's presence might have exerted over staff performance. Specifically, during baseline conditions, staff participants worked in the absence of the experimenter's presence, whereas during both staff training and performance pay conditions the experimenter was present. It is possible that the mere presence of the experimenter was a principal component that contributed to performance increments during both staff training and performance pay. Further research should examine this possibility by (a) comparing the absence and presence of the experimenter but in the absence of any programmed procedures or (b) holding the experimenter's presence constant throughout all experimental conditions. Such component analyses should shed light on the role of the experimenter's presence under the present laboratory preparation.

A second limitation was the failure to analyze the effects of a novel staff management intervention and then demonstrate its corresponding effects in a natural setting. Doing so was beyond the purview of the present study. However, each of the three thematic lines of simulation research cited in the introduction demonstrated the reproducibility of their novel findings in a different naturalistic setting. What is unclear is whether these studies tested and revised their preparation until it reproduced characteristic findings, prior to direct application in applied settings. Because the present study presents a methodology for systematically developing a suitable simulation, further research may be able to more definitively determine whether and what kind of simulations can be used to develop interventions whose effects are likely reproducible in natural settings.

A third limitation was that the simulation reproduced only three common staff management findings. Moreover, it demonstrated this with only one variation of staff training and one variation of staff management. While these variations are commonly used, we cannot assume that the simulation would reproduce the findings from other variations. This limitation may affect the reproducibility of findings with novel interventions. Further research to explore other well-studied interventions could clarify the generality of the simulation.

A fourth limitation was that any number of artificial elements, procedural differences, and participant characteristics between this laboratory setting and a given applied setting might limit the implications that can be drawn. To illustrate, the staff participants in this study were college students who worked during brief 20-minute sessions under simplified laboratory conditions while engaged in relatively minimal task requirements with one client. These duties unquestionably represent only a small portion of human service staffs' overall job responsibilities. By comparison, most applied studies have focused on human service staff employed in settings where the problem at hand is usually of immediate social importance. Furthermore, in those settings, staff typically work relatively longer shifts, amid varying competing and concurrent contingencies. Thus, a novel intervention might be effective with college students working for bonus points under laboratory conditions, but not for employees working for pay under more naturalistic conditions. Additionally, a novel intervention might work within the brief time frame of the simulation whereas it might not maintain its effect during a typical 40-hour workweek. These differences may preclude the generality of future novel findings from the simulation. Further research could clarify some of these issues, inductively, by systematically varying the parameters of the simulation to incorporate more features to approximate actual topographical similarities in workplace environment. However, this may not be a critical limitation because functional not topographical similarities often appear to be more crucial determining variables (Locke, 1986, pp. 3-9).

These limitations notwithstanding, the present study adds to the literature on simulation research in at least two ways. First, it extends the lines of simulation research by targeting a human service delivery situation. Previous published simulation studies have targeted settings such as those in business (e.g., Alvero & Austin, 2004; Sasson & Austin, 2005), community (e.g., Deslauriers & Everett, 1977; Everett et al., 1978), and industry (e.g., Dickinson & Gillette, 1993; Frisch & Dickinson, 1990; LaMere et al., 1996), but not, to our knowledge, human services. Second, it adds to the simulation literature by incorporating systematic replications as a means of developing and assessing the simulation. The previous reports of simulations make no mention of using systematic replications as a method to assess the probability that their findings would likely transfer to natural settings prior to direct application.

To summarize, logistical and ethical factors that may complicate the investigation of novel interventions to manage staff performances in human services suggest the importance of designing suitable simulations. General concerns about whether findings from laboratory simulation studies would likely transfer to natural settings informed the methods for assessing the present laboratory preparation. By reproducing three common staff management findings, this study suggests that the results of future experiments under this preparation may predict outcomes in actual human service settings. The present preparation, therefore, may complement staff management research in human services in at least two ways. First, it may provide a useful medium for conducting component analyses of preexisting staff management interventions in order to identify and isolate the minimum components necessary to accomplish the same outcomes more simply. Second, it may serve also as potentially useful medium for designing and pre-testing novel interventions prior to direct application in applied settings. Both approaches should minimize the logistical and ethical challenges of conducting research in applied settings and further maximize an analysis of the variables controlling staff service delivery performances.

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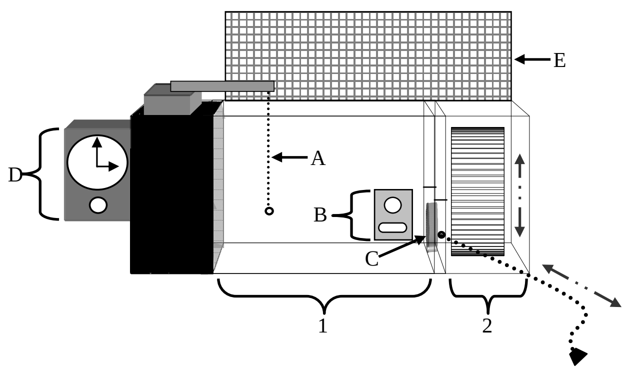
Appendix A

Student Mouse Project: Introduction

This project is designed to examine the interactions between people and tame mice. You will earn 20 bonus points per 20-minute session of participation, along as you arrive to your schedule session on time and stay for the full duration. All sessions will be held in Haworth, room 1128. In this project, you will be working with a mouse that has been previously trained to "ask" to run in a running-wheel by first completing a sequence of two "chained responses" in a mouse chamber.



Chamber

The above diagram is the mouse chamber. The chamber has two separate compartments. Compartment 1 contains a metal chain (A) and a lever with a stimulus light located directly above (B). The metal chain, when pulled by the mouse, will automatically turn on the light above the lever for 10 seconds. Compartment 2 contains a running-wheel. In order for the mouse to have access to the running-wheel, a door (C) to Compartment 2 will have to be manually opened. In order for the mouse to be returned to Compartment 1, the running-wheel will have to be manually lifted from Compartment 2 and placed in Compartment 1. A clock (D) mounted on the outside of the chamber is your "session time clock." The clock is programmed to turn on at the start and off at the end of your scheduled 20-minute session. A light below the clock will signal the start and the end of your scheduled session. Your session clock will only operate when the clock light is lit and the chamber lid (E) is open. Earned bonus points will be based on your time spent during each scheduled session, as indicated by your session time clock. Further details on how to operate the chamber will be provided prior to your first session.

Object

In order to examine the interactions between people and tame mice, you will be requested to maintain the sequence of chained responses by the mouse. That is, you will be requested to keep the mouse "asking" to run in the running-wheel. To do this, you will work with your mouse for 15 minutes and complete at least 15 correct trials during your scheduled 20-minute session. Here's a description of a correct trial. When the mouse is in Compartment 1 of the chamber and the light above the lever is off, you will (a) wait until the mouse first pulls the metal chain, which will turn the lever light on for 10 seconds, and in the presence of the light; (b) observe the mouse complete two lever presses; (c) open the door to Compartment 2 to allow the mouse to run the running-wheel for at least 5 seconds; and, finally, (d) return the mouse back to Compartment 1 of the chamber. Further details, and a demonstration of a correct trial, will be provided prior to your first session.

Overview

1. Chamber (start)

Open the chamber lid. This starts your session time.

2. Object

Work with your mouse for 15 minutes and complete at least 15 correct trials during your session.

3. Chamber (end)

Close the chamber lid. This ends your session time.

Please note that you will have to take a written quiz over this material. You will have to score 100% on the quiz before you are allowed to participate.

Appendix B

Student Mouse Project: Quiz

Name:________________________

1. You will earn _____ bonus points per scheduled session of participation.
   a. 10
   b. 15
   c. 20
   d. 25
2. How long is each scheduled session?
   a. 10 minutes
   b. 15 minutes
   c. 20 minutes
   d. 25 minutes
3. How will you earn bonus points?
   a. by arriving to your schedule session on time
   b. by participating for 15 minutes
   c. by participating for 20 minutes, irrespective of arriving to your schedule session on time
   d. by arriving to your schedule session on time and staying for the full duration
4. The clock mounted on the outside of the mouse chamber is your "session time clock." The clock is programmed to turn on at the start and off at the end of

your scheduled session. A light below the clock will signal the start and the end of your session. The clock will only operate when ______.

   a. the chamber lid is open
   b. the clock light is lit
   c. the clock light is lit and the chamber lid is close
   d. the clock light is lit and the chamber lid is open

5. Your earned bonus points will be based on your time spent during each scheduled session, as indicated by ______.
   a. your verbal report
   b. your session time clock
   c. none of the above
6. It is requested that you work with your mouse for _____ minutes during each scheduled session.
   a. 10
   b. 15
   c. 20
   d. 25
7. It is requested that you complete at least _____ correct trials during each scheduled session.
   a. 10
   b. 15
   c. 20

d. 25

8. Provide an answer for the words omitted in the blank space below: “Here’s a description of a correct trial. When the mouse is in Compartment 1 of the chamber and the light above the lever is off, you will (a) wait until the mouse first _____, which will turn the lever light on for 10 seconds, and in the presence of the light; (b) observe the mouse complete *****; (c) open the door to Compartment 2 and allow the mouse to run the running-wheel for at least *****; and, finally, (d) return the mouse back to Compartment 1of the chamber.”
    a. presses the lever
    b. presses the lever twice
    c. pulls the metal chain
    d. pulls the metal chain twice
9. Provide an answer for the words omitted in the blank space below: “Here’s a description of a correct trial. When the mouse is in Compartment 1 of the chamber and the light above the lever is off, you will (a) wait until the mouse first *****, which will turn the lever light on for 10 seconds, and in the presence of the light; (b) observe the mouse complete _____; (c) open the door to Compartment 2 and allow the mouse to run the running-wheel for at least *****; and, finally, (d) return the mouse back to Compartment 1 of the chamber.”
    a. one lever press

b. two lever presses

c. two metal chain pulls

d. one metal chain pull

10. Provide an answer for the words omitted in the blank space below: “Here’s a description of a correct trial. When the mouse is in Compartment 1 of the chamber and the light above the lever is off, you will (a) wait until the mouse first *****, which will turn the lever light on for 10 seconds, and in the presence of the light; (b) observe the mouse complete *****; (c) open the door to Compartment 2 and allow the mouse to run the running-wheel for at least _____; and, finally, (d) return the mouse back to Compartment 1 of the chamber.”

    a. 5 seconds

    b. 4 seconds

    c. 3 seconds

    d. 2 seconds