Task Clarification and Feedback Improves Room Tidiness and Safety in a Training Center

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Abstract

In training centers, staff and client safety is of paramount concern. Efforts to keep an area clean can contribute to better safety. This study employed a multiple-baseline across-participants-and-locations design to assess the effectiveness of a treatment package, which included task clarification and feedback, to increase room tidiness in a behavioral training center in Hong Kong. Results show that the treatment package was effective in improving room tidiness.

Keywords Cleanliness · Staff training · Autism center · Behavior analysis

An estimated 8.7 million children and teens from birth to age 19 were treated in emergency departments for unintentional injuries, in which more than 9,000 of them died due to their injuries (Centers for Disease Control and Prevention, 2008). Moreover, according to the U.S. Bureau of Labor Statistics (2017), in 2016 there were about 2.9 million nonfatal injuries and illnesses reported in private industry work settings, which occurred at a rate of 2.9 cases per 100 full-time-equivalent workers. The National Safety Council (2015) noted that unintentional injuries were the fifth leading cause of death in the United States in 2012. Although teaching safety skills to children and staff members is essential, it is equally important to

maintain a clean and safe environment to prevent accidents from occurring. Behavioral principles can be applied to workplace settings to aid improving safety, often as part of an organizational behavior management (OBM) strategy. According to Wilder, Austin, and Casella (2009), there are two categories of OBM intervention: antecedent-based interventions (e.g., task clarification, goal setting, equipment modification, prompting, training) and consequence-based interventions (e.g., feedback, monetary and nonmonetary incentives). Although it is unclear which intervention approaches are superior to the others, it appears that a combination of both interventions might achieve the best results. Reid, Parsons, and Green (1989) suggested that improved performance obtained from antecedent strategies alone usually cannot be sustained unless direct feedback is applied as a consequence of behavior. Wooderson, Cuskelly, and Meyer (2014) found interventions that only focus on changing individual staff characteristics, such as staff capacity, knowledge, and motivation, are less effective than approaches that address environmental issues, such as expectations and tools, especially when combined with interventions that focus on staff members' needs and skills. Alvero, Bucklin, and Austin (2001) noted that intervention packages that involved both antecedent manipulations and feedback achieved more consistent effects.

Feedback, one of the most commonly used and effective strategies to address performance issues (Nolan, Jarema, & Austin, 1999), has been found to be successful in increasing performance in various organizational settings (Alvero et al., 2001). Another OBM technology, task clarification, provides employees with specific details on job components (Crowell,

Research Highlights

- Failure to tidy up a room postsession can be dangerous at worst and rude at best.
- Interventions that address antecedent and consequence manipulations might best alter and maintain behavior.
- This intervention made use of smartphone technology to record and disseminate data among practitioners.
- The intervention proved to be cost effective, requiring nothing more than staff smartphone access.

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Anderson, Abel, & Sergio, 1988). Task clarification has been effectively combined with feedback or other strategies as a treatment package to produce behavior change in different organizational settings (e.g., Rose & Ludwig, 2009).

Work performance interventions usually focus on improving staff member and/or client behaviors in disability services. In this vein, we focus on client and staff safety by addressing workplace tidiness. Whereas other research has successfully addressed treatment room cleanliness (see Carr, Wilder, Majdalany, Mathisen, & Strain, 2013), this study investigates a cost-effective, low-effort intervention to enhance tidiness at an applied behavior analysis training center through a multiple-baseline across-participants-and-locations design.

Method

Participants and Setting

Administrative staff and supervisors at a Hong Kong-based treatment center expressed concerns regarding the tidiness and safety of the therapy rooms. Despite having a picture-coded storage system guiding therapists to put toys and materials in their original places, toys and materials were often misplaced or missing. To save time, many therapists often left materials on the table or floor and reused them the next session or day. Moreover, many therapists regularly used spinning office chairs as carts to transport materials from room to room and left them unattended, which caused potential danger to the clients and staff.

To resolve these concerns, four therapists (two males, two females, aged 22–25) at the training center participated. The therapists had been working in the agency for 3–9 months. Therapists 1 and 2 worked with a student in Room 1, and Therapists 3 and 4 worked with another student in Room 2. Therapists 1 and 3 worked in their respective rooms from 9:00 a.m. to 11:45 a.m., and Therapists 2 and 4 worked in their respective rooms from 1:00 p.m. to 3:30 p.m., every Monday through Friday. A third room, Room 3, was included as a no-treatment control. There were three nonparticipant therapists working with another student in the control room in the morning and afternoon 5 days a week.

Baseline, treatment, maintenance, and follow-up were implemented approximately 10 min before the morning and afternoon sessions (i.e., 8:50 a.m. and 12:50 p.m.) in all three rooms. Data from covered sessions when the participating therapists were sick were discarded. The target rooms were not shared by any other nonparticipant therapists, and there was only one therapist working with a student in each room during the study.

Material boxes, oversized teaching materials, and general toys that belonged to the rooms were indicated by pictures. A cabinet (approximately 0.42 m × 0.96 m × 3.60 m) was used

for storage in each room. Rooms contained one to two tables, three to four children's chairs, one spinning office chair, one sofa stool, and one easel. The number, size, and arrangement of the furniture in each room were different.

Materials

Data sheets, smartphones installed with WhatsApp, and a laptop computer were used. A group chat, which included the participants and the experimenter, was created by the experimenter prior to treatment using WhatsApp. WhatsApp is a free messenger app for smartphones that can be used to send text messages, audio, video, or images either one-on-one or as a group. All data and feedback sent via WhatsApp were available to all participating therapists and the researchers.

Response Measure and Agreement

There were 5 rule-following opportunities per room each session (Rules a–e), and a total of 10 rule-following opportunities per room each day (two therapists per room). The dependent variable was calculated by dividing the total number of rules followed by the total number of rule-following opportunities before converting to a percentage. The occurrence of rule following was defined as following the rules exactly as described. Any omission, alteration, or addition to the rule was considered a nonoccurrence of rule following.

The rules were (a) no storage on spinning office chairs; (b) no objects on tables after sessions except for one box of tissues and one bottle of hand sanitizer; (c) put all furniture, material boxes, and general toys in their original places after each session, except for the material boxes after the morning sessions; (d) keep all teaching materials in the material boxes except for those that are too big; and (e) place oversized teaching materials in the assigned places in the room. As the morning and afternoon sessions took place in the same rooms for both of the students, therapists were allowed to leave the material boxes under the tables after the morning sessions.

Prior to baseline, supervisors who worked with the students from the target rooms identified what teaching materials should be found in the students' material boxes. Pictures of the rooms, material boxes, and general toys were taken by the participating therapists during each baseline, treatment, and maintenance session. The pictures of the target rooms during follow-up and the control room during baseline were taken by the examiner. Participants took photographs of their treatment room when they entered the room to start their shifts.

Data-collection training was provided to the second, non-participating therapist. She was trained to record the occurrence and nonoccurrence of rule following of each rule with 90% accuracy for two consecutive sessions. The examiner and the second observer observed 10 therapy rooms and recorded the number of occurrences and nonoccurrences of rule

following in those rooms after the morning or afternoon sessions. Agreement on rule following was based on nominal data (yes/no) and was subjected to an unweighted kappa analysis. The second observer recorded 50% of sessions in Room 1, 46% (11/24) of sessions in Room 2, and 33% of sessions in the control room. Unweighted kappa—an agreement and reliability statistic that accounts for chance agreement—was 0.7668 for Room 1, 0.7513 for Room 2, and 0.9312 for Room 3.

Procedure

Baseline No instructions, feedback, or any kind of prompts, except for the existing picture-coded storage system, were provided to the therapists during baseline. The first author took pictures of the furniture, storage of general toys and oversized teaching materials, location of material boxes in the rooms, and the content of the material boxes after the morning and afternoon sessions of the target and control room when no one was looking.

Task Clarification and Feedback A group meeting (Therapists 1 and 2; Therapists 3 and 4) was conducted after baseline concluded. Each meeting was approximately 30 min long. During the meetings, the existing picture-coded storage system, required furniture and furniture arrangement of each target room, operational definition of the five rules, and recording procedure were discussed. Examples and nonexamples of the rules were given to the therapists. The recording procedure involved the therapists (a) taking one to two pictures that fully captured the furniture, storage of general toys and oversized teaching materials, and material boxes as soon as they entered the room; (b) taking a picture of the content of the material boxes before they prepared for the sessions; and (c) sending the pictures to the group chat on the WhatsApp application immediately. The therapists were instructed not to alter anything in the room before the pictures were taken nor talk to nonparticipating therapists about this study.

Praise was given via WhatsApp when the participants followed four out of five rules (e.g., “You guys followed all the rules. Good job!”). Feedback was provided via WhatsApp when they did not follow more than one rule (e.g., “It looks like there is an extra chair in the room.”). Maintenance began when the percentage of rule following reached 80% or above for five consecutive sessions. Individual meetings would be held if the therapists did not meet the phase-changing criterion within seven sessions during treatment.

Maintenance and Follow-up Maintenance was the same as that in treatment except the frequency of feedback reduced from once a day per therapist to four to five times each week per room. The study was considered finished when the percentage of rule following was 80% or above for five

consecutive sessions during maintenance. Follow-up occurred a week after the maintenance condition. The experimenter met with the participants’ supervisors to review study results and recommended that the supervisors provide intermittent feedback about room tidiness and safety and use those rules to evaluate the therapists’ performance as a means to promote maintenance and generalization.

Results

Figure 1 displays the percentage of rule following across all conditions of each room. The percentage remained low during baseline. Rule following improved with the implementation of treatment and remained higher than baseline during follow-up for both Room 1 and Room 2. Specifically, rule following in Room 1 improved from a mean of 33.33% in baseline to a mean of 86.00% in treatment, 100% in maintenance, and 95.45% in follow-up. Rule following in Room 2 improved from a mean of 45.00% in baseline to a mean of 100% in treatment, 96.00% in maintenance, and 100% in follow-up. Room 3’s baseline rule following was 24.17%. Table 1

Fig. 1 Percentage of rules followed across Room 1, Room 2, and Room 3 (control room); BL = baseline, Treat = treatment, and Maint = maintenance

Table 1 Summary percentage of rule following in each room across all phases

Rule	Baseline			Treatment			Maintenance			Follow-Up		
	Rm 1	Rm 2	Rm 3	Rm 1	Rm 2	Rm 3	Rm 1	Rm 2	Rm 3	Rm 1	Rm 2	Rm 3
a	50%	56%	23%	90%	100%		95%	100%		95%	100%	
b	0%	38%	15%	90%	100%		95%	90%		90%	100%	
c	0%	13%	29%	60%	100%		100%	90%		90%	100%	
d	100%	94%	52%	100%	100%		100%	100%		100%	100%	
e	17%	25%	0%	90%	100%		100%	100%		100%	100%	

summarizes these data in terms of the percentage of rule following by rule, phase, and room number.

Discussion

The results indicated that the treatment package, which consisted of task clarification and feedback, was effective in improving room tidiness and safety in a training center for individuals diagnosed with autism spectrum disorder. Moreover, the treatment effect was maintained in a 3-week follow-up. This study expanded the use of OBM strategies on tidiness and safety-related behaviors in a therapeutic setting. The major strength of this study lies in its simplicity; there was only one 30-min meeting held for each room before treatment started, the treatment required little skill from the participants, data were collected and analyzed remotely via a smartphone application, and the treatment had no cost to the organization. Alvero et al. (2001) found that a combination of private feedback (i.e., feedback information was given to the performing individual only) and public feedback (i.e., feedback information was available not only to the performing individual or group but also to other members of the organization) was more consistently effective than either private or public feedback alone. Although the effectiveness of different types of feedback was not analyzed in this study, the results showed that public feedback contributed to the improvement of room tidiness. Additionally, phases in which participants photographed their rooms might have had an additional intervention component in that they had to present their performance via the app; specifically, this component was absent during baseline and follow-up and in the control room. Whether and how participant-produced photographs influenced responding will need to be the focus of future work.

However, the findings should be interpreted with caution. First, despite the treatment effect maintained in the 3-week follow-up, it is unclear whether treatment effects would be maintained after a longer period and how effective the existing staff evaluation system would be in terms of providing delayed consequences to the therapists. Second, generalization and treatment acceptability were not investigated in this study.

Third, no treatment integrity checks were initiated. Fourth, although it is common, this study did not conduct any formal preintervention assessment. Finally, treatment effectiveness may be affected by the complexity of the target behaviors. Tidying up requires few complex skills from the participants, which might contribute to the significant treatment effect. However, training may be necessary if target behaviors are complex and participants have not acquired the related skills and knowledge yet. Investigators might consider extending the follow-up period, identifying other consequences and examining their effectiveness in changing employees' behaviors in organizational settings, and including generalization and treatment acceptability in further studies.

Compliance with Ethical Standards

Conflict of Interest Yuen Yan Ng declares that she has no conflict of interest. David Fischer declares that he has no conflict of interest. Benjamin N. Witts declares that he has no conflict of interest. This project was completed in partial fulfillment for a master's degree in applied behavior analysis by the first author under the supervision of the second and third authors.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed assent was obtained from all families of individual participants included in the study.

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