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ABSTRACT

A study examined the effects of using a musical clocklight as discriminative stimulus, paired with individual and group contingency rewards, on the decibel level in an elementary school lunchroom. Subjects were 256 students aged 5-12, who ate lunch in two sessions for younger and older students. The musical clocklight (MCL) apparatus consisted of a sound level meter that monitored and displayed decibels, a stoplight such as those used for traffic signals, a clock, a microphone, and a CD player. During the baseline condition, decibel levels in the lunchroom were measured at 30-second intervals. On the day prior to the initial MCL session, students were informed that the stoplight would change in accordance with noise levels and would control the delivery of music and the accumulation of time on the clock. If the noise became too loud, the light would turn red, the music would stop, and no time would accumulate on the clock. Upon accumulating 20 minutes per day for 12 days, the students would be awarded a pizza party. In addition, age-appropriate individual rewards were presented to students displaying appropriate behavior. Data indicate that the clocklight paired with reward contingencies decreased decibel levels significantly for both older and younger groups. The younger students reverted to baseline conditions when the clocklight was withdrawn. (SV)

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THE EFFECTS OF A DISCRIMINATIVE STIMULUS, PAIRED WITH INDIVIDUAL AND GROUP REWARD CONTINGENCIES, ON THE DECIBEL LEVELS IN AN ELEMENTARY SCHOOL LUNCH ROOM

The current investigation is a replication, with modifications in setting and dependent variables, of the West et al. (1995) article. West et al. (1995) conducted a musical clocklight study, which encouraged positive classroom behavior. The study also improved upon the original clocklight by adapting new technologies and adding a radio/tape player. The original clock-light (sans music) was part of the Program for Academic Survival Skills (PASS), a classroom management program at the Center at Oregon for Research in the Behavioral Education of the Handicapped (CORBEH) at the University of Oregon (Green wood, Hops, Delquadri, & Walker, 1974). PASS was initially used in elementary school classrooms as a group management program for educational related behaviors. Its most significant characteristics were (a) a group reward contingency; (b) importance of following clearly stated rules; and (c) a clocklight instrument that signaled the students when all of them were following the rules and accumulated and recorded the total amount of time the rules were followed.

Group reinforcement contingencies have shown to be successful by Young, Likins & Johnson. (1982). Their group reinforcement procedures was effective in increasing on-task and rule-following behavior of a third-grade class of 52 students that included four behavior problem students referred to special education. The intervention included the teachers setting a class goal and the class selecting a group activity for meeting the goal.

Through this study a comparison was made to determine the effects of a musical clock-light, paired with individual and group reward contingencies on the decibel levels in an elementary school lunchroom. This study was conducted within a northern Utah Elementary school lunchroom. The subjects were 256 elementary students ranging from ages 5-12. Our results indicate that a musical clocklight, combined with individual and group rewards were successful in reducing decibel levels within a lunchroom, across groups, when compared to baseline levels. Results are promising, however, further research on the utility of this musical clocklight when paired with individual and group reward contingencies across contexts and groups is warranted.

The Effects of a Musical Clock-Light Program, Paired with Individual and Group Reward Contingencies, on the Decibel Levels in an Elementary School Lunch Room

Method

Setting and Participants

The study was conducted within a northern Utah elementary school lunchroom. The lunchroom was approximately 40' x 80'. The east wall included two separate doors, one entrance and one exit. The space directly in front of the exit door, inside the lunchroom contained the students' reading rug, a carpet about 7' X 7'were students would sit and read upon completion of their meal. The west side of the lunchroom constituted the lunch lines, lunch trays, silverware, beverage dispenser, and salad bar. The kitchen and dishwashing station were located on the north side of the building is where the clock light was located on the south wall. The center of the lunchroom consisted of 15 round tables, each with the capacity to seat 8 students. They were placed in rows of 6, 4, and 5, respectively. The lunchroom staffs, and a maximum of two parent volunteers (not always the same), were also present in the lunchroom during the study. The subjects were 256 elementary students ranging from age 5 - 12. The

students were divided into two groups, based on the time their class arrived at the lunchroom. Group I had completely exited the lunchroom before Group II arrived. Group I included 148 students, enrolled in kindergarten through 3rd grade. Group II included 184 students, enrolled in grades 3 through 5.

Materials/Apparatus

Materials for the Musical Clock-Light Program (MCLP) included; (a) a Radio Shack Digital Sound Level Meter with the capability to monitor and display decibels from 1 to 120, (b) musical clock-light set-up, which included a stoplight such as those used for traffic signals. The clocklight lights (red, yellow, and green) were set to differing criteria: the green light illuminated if the decibel level was at 73.5 dB or less; the yellow light illuminated if the noise level was at 73.6 to 74.5 decibels, the red light illuminated if the noise level exceeded 74.6 decibel, an analogue clock, a microphone used to detect noise levels; a CD player, and CD's chosen by the principal; (c) data sheets containing two tables, ten columns by five rows, one for each lunch period, and a space at the bottom of each table for the time accumulated on the analogue clock, (d) small reinforcers, such as super-balls, pencils, erasers, and stickers; no edibles, (e) larger reinforcers such as notebooks, address books, pencil sets, gift certificates, and larger toys, (f) raffle tickets, and (g) poster to track daily progress.

Measurement and Data Collection

The average decibel levels in the lunchroom during sessions were measured using the sound level meter. The decibel readings were taken at 30-second intervals during each of the two lunch periods and recorded on the daily data sheet for the duration of the study. The time accumulated on the analogue clock was recorded at the end of each session on the data sheet during the Clock-light Program. At the conclusion of the study the staff of the lunchroom, along with the principal of the school were interviewed through a consumer survey. This survey measured the perceived effectiveness of the clock-light program.

Experimental Conditions

Baseline

Prior to the baseline condition, the musical clock-light program was installed in the lunchroom, with the exception of the CD player which was already present. The MCLP was non-operational during the baseline condition. Decibel levels were taken at 30-second intervals, during each group's 25 minute lunch sessions. Observers were stationed in the lunchroom, on the north wall, in close proximity to the student reading rug and exit. Students would enter the lunchroom after recess and give their lunch numbers to the lunch administrator. The children would then cross to the far side of the room and pick up a hard plastic tray, silverware, and a beverage. Next they would then continue to the kitchen window and receive their lunch. Upon receiving their lunch students would proceed to a table of their own choosing to eat. When the students finished eating they would present their tray to the adult volunteer located at the dishwashing station and retire to the reading rug. Once at the reading rug students would wait for 10-15 minutes before being excused to class. There was limited supervision by the principal and/or staff in the lunchroom. In a non-systematic manner the principal would walk thought the lunchroom and prompt and praise appropriate behaviors. Occasionally, the principal would clap three times to draw the student's attention. The principal would then prompt students to display appropriate lunchroom behavior. The baseline condition continued for each group until the MCLP was introduced and implemented. Form the data collected during the baseline condition the musical clock-light's decibel sensitivity level was determined.

Musical Clock- Light Program Condition

On the day prior to the initial session researchers introduced the musical clock-light program to the children and reminded the students to use appropriate behavior in the lunchroom. Appropriate behavior was described as using "2 inch voices" (speaking with a tone that can only be heard from 2-inches away), feet on the floor, and pockets on the seat. Students were informed that the stoplight on the wall would control the delivery of music and the accumulation of time on the clock.

The students were instructed that researchers would walk around the lunchroom during the lunch period, presenting those displaying appropriate behaviors with individual rewards. Students were informed that the stoplight (red, yellow, and green) would change in accordance with the noise level in the lunchroom. The researcher

stated, that while the light was green or yellow, music from the lunchroom sound system would play and the minute hand of the clock would begin to accumulate time. If the light turned red the music would stop, and the clock would not accumulate minutes. Upon accumulating 12 days, at 20-miutes each on the clock, the students would be rewarded a pizza party. This instruction took approximately five minutes.

The two types of contingencies presented during this condition were: (a) A*ge appropriate individual rewards*; small items to Group I and raffle tickets to Group II. The students in Group II would put their name and classroom number on the tickets and deposit them into a container provided by the researchers. Larger prizes were then distributed to 3 winners daily, following the lunch period. Age appropriate individual rewards were presented to those displaying appropriate behavior. (b) *Group reward*, a Domino's ™ pizza party, contingent upon a group accumulating 20 minutes or more on the clock, for12 days. The accumulation of days was tracked on a poster, which was displayed in the lunchroom.

The conditions for data collection, setting and daily procedures of the lunchroom, described in baseline went unchanged throughout the MCLP condition. The difference was the implementation of the MCLP. During the MCLP condition the following occurred: (a) at the beginning of each lunch period researches activated the MCLP, (b) the researchers randomly prompted students as they walked into the lunchroom to keep their eyes on the clock-light and use appropriate lunchroom behavior, and on occasion the principal, lunchroom staff and/or volunteers would also prompt appropriate behavior, (c) researchers walked around the lunchroom and praised students, presenting individual rewards of small reinforcers to those displaying appropriate behavior, (d) if the daily criteria was achieved, researchers would clap to draw attention to the clock and congratulate the students. The researchers then recorded the achievement on the poster. At the conclusion of Group I's lunch period the MCLP was turned off and the clock was reset to 12:00. Upon Group II's arrival the MCLP procedures were implemented in the same manner as for Group I, with the exception of a change in the reinforcers. Group II received raffle tickets as reinforcers. The students put their name and classroom number on the tickets and deposited them into a container provided by the researchers. Three winning ticket were selected each day. The MCLP condition continued until the Group contingency was meet. At this time the MCLP, was withdrawn and the group contingency was presented.

Withdrawal of CLP (Group I only)

The condition constitutes a return to the baseline condition in its entirety. The day after the presentation of the group contingency, Group I returned to the baseline conditions listed above. The MCLP set up remained in the lunchroom but was inactive. The decibel readings were taken at 30-second intervals for the 25-minute lunch period.

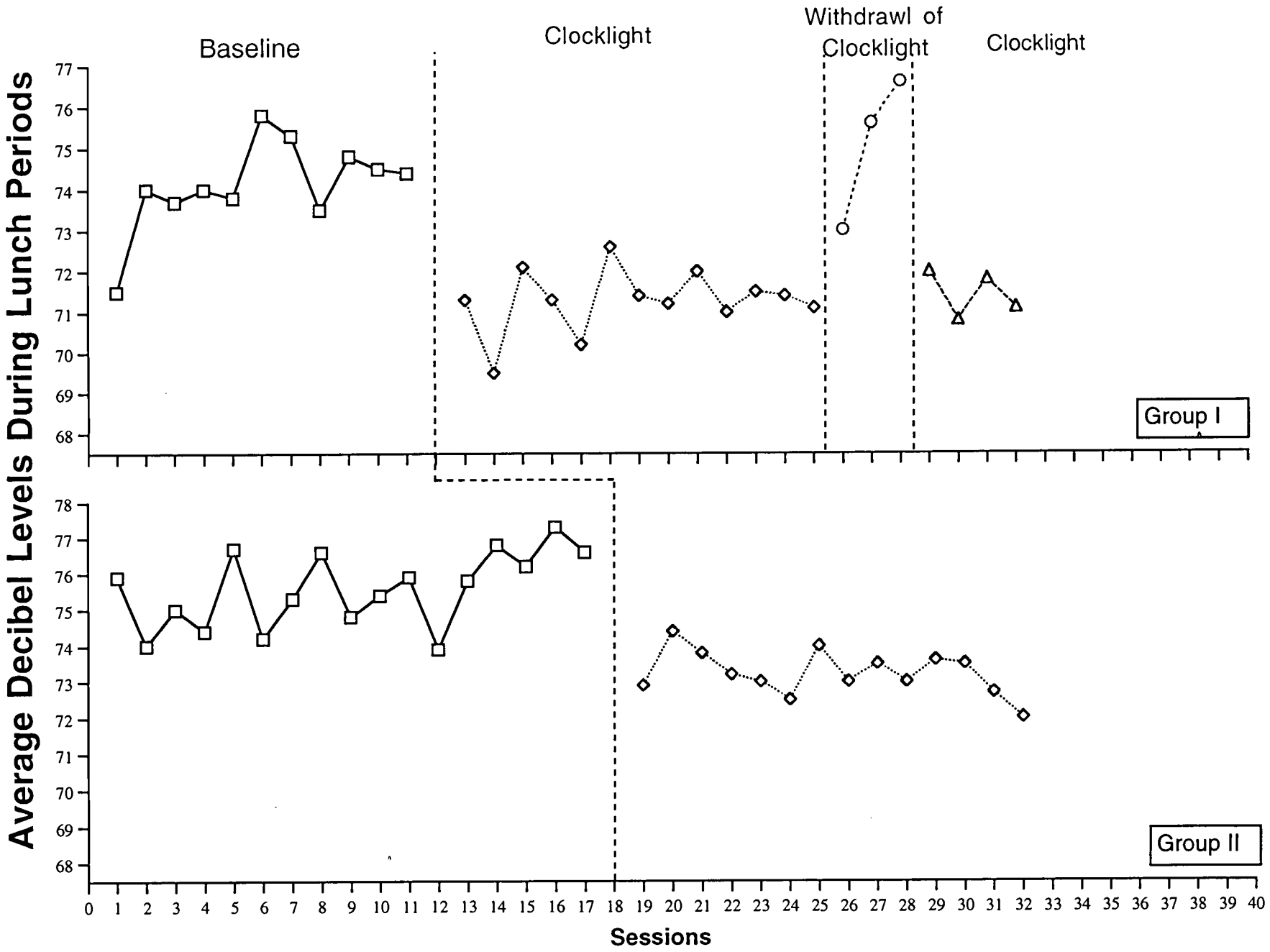
Design and General Procedure

The current study was conducted in two phases across two groups. The first phase consisted of a baseline measurement of decibel levels during the two groups' lunch periods. Phase 2, following baseline, included the implementation of a discriminative stimulus (the clocklight), paired with individual and group reward contingencies conducted within a multiple baseline across groups design. A withdrawal phase was implemented for Group I (Richards, Taylor, Ramasamy, & Richards, 1999), to further illustrate the effects of the independent variables. The evaluation was conducted by comparing the baseline decibel levels with those recorded during the intervention phase. The results were then compared across the two groups of students. Through these comparisons, the effects of the independent variables were illustrated.

Results

Average decibel levels were compared during baseline and the intervention phase. The data illustrates the clocklight paired with reward contingencies decreased the average decibel levels across two groups.

The average decibel level during baseline was 74.2 dB for Group I and 75.6 dB for Group II. The decibel level during the MCLP condition averaged 71.3 dB for Group I; and rebounded to 75 dB during the withdrawal phase. The average decibel level during the MCLP for Group II was 73.2 dB. The data shows a 2.9 dB decrease in sound levels between baseline and the MCLP for Group I. Group II's data illustrates a 2.4 dB decrease in sound level between baseline and the MCLP phase. For both groups the decibel levels decreased with the implementation of the MCLP.



Figrue 1. The Effects of a Clocklight on the Decibel Levels in an Elementary Lunchroom

Discussion

This study illustrates the use of a discriminative stimulus, the musical clocklight, paired with contingent rewards, significantly decreased the decibel levels in an elementary school lunchroom. The lunchroom staff and school principal were pleased with the results of this experiment. This was shown by results from a consumer survey. The children involved in this study were also pleased. They made comments to the researchers asking if it could continue. The use of a musical clock-light can be replicated many school settings. This has been shown as in previous research, which our study supported. The experiment did have some limitations. The decibel meter used to monitor decibels was not placed in close proximity to the microphone used to measure levels for the clocklight; this would occasionally pose a problem if a noise were made directly next to the decibel meter. Although results are promising, additional research on the utility of this discriminative stimulus (the musical clocklight), individual and group reward contingencies across contexts and groups is warranted.

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