

*VARIABLE EFFECTS OF A BEHAVIORAL
TREATMENT PACKAGE ON THE PERFORMANCE OF
INLINE ROLLER SPEED SKATERS*

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We investigated the effects of a treatment package on the performance of correct relay tags with 4 inline speed skaters. The treatment package included verbal praise following correct tags, visual feedback of performance data, and instruction for improving performance. Initial gains in the frequency of correct tags were not maintained at 6-month follow-up when baselines were reestablished. Performance on the second intervention phase for the 3 original subjects was variable and differed from the initial phase, whereas the original findings were replicated in the 4th subject. Possible reasons for this variability and implications for future research and behavioral sport interventions are considered.

DESCRIPTORS: speed skating, sports, treatment package, reinforcement

Researchers have successfully used verbal feedback and differential positive reinforcement to improve performance of specific behaviors important to a variety of different sports, including football, tennis, and swimming (Allison & Ayllon, 1980; Buzas & Ayllon, 1981; Koop & Martin, 1983; Ward & Carnes, 2002). These studies indicate that a behavioral approach to treatment can increase the correct execution of skills or decrease errors in skills that are demonstrated in a variety of sports. We have replicated and extended these findings to competitive inline roller speed skating during uninterrupted natural performance conditions.

METHOD

Participants and Setting

One female and 3 male skaters, aged 12 to 16 years, were selected from a competitive

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inline roller speed skating team. Each participant had been skating competitively for 6 months to 2 years and attended practices approximately three times per week. All skaters were having difficulty consistently making correct relay tags, despite modeling and verbal instructions routinely given by the coach prior to relay races.

Practice was held three times weekly in an indoor roller-skating rink. Corner pylons were placed in designated positions to delimit a 100-m oval track as required by the United States Amateur Roller Skating (USARS) competition regulations. A relay box was designated in the center of the rink floor as a standardized starting position for relay team members in keeping with USARS requirements.

Response Definitions and Data Recording

The behavior selected for study was a relay tag. During relay races, skaters had to exit the center relay box when a designated teammate rounded one end of the rink. The skater preparing for the tag then accelerated in the interior of the next turn until he or she passed the corner pylon, at which point the skater entered the traffic lane directly in front of his or her partner in order to receive a push and

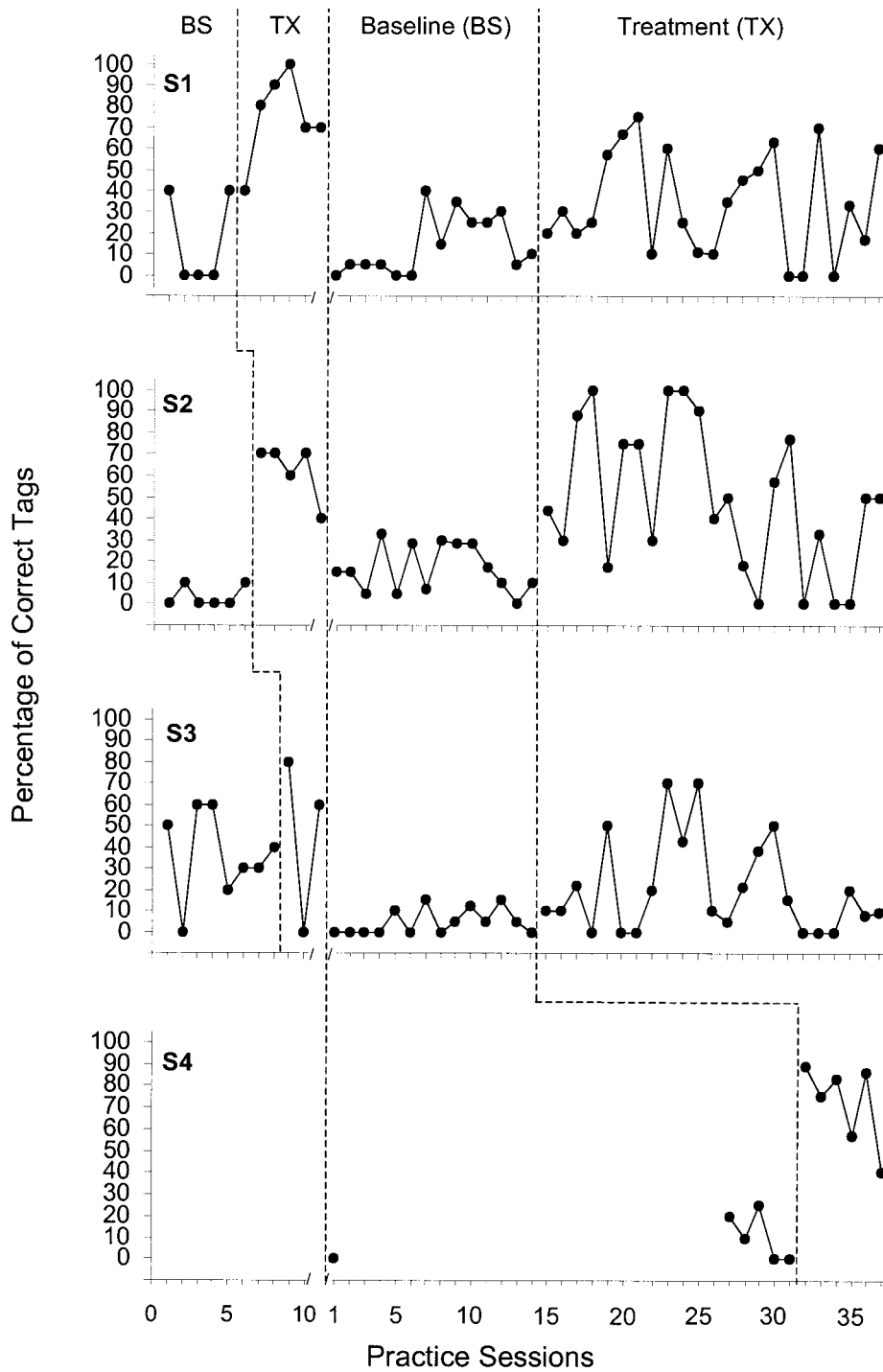


Figure 1. The percentage of trials in which relay tags were executed correctly as a function of baseline and behavioral intervention conditions for 4 skaters. The first AB phase is shown in Sessions 1 through 11. The second phase began approximately 6 months following the end of the first intervention. These data are presented after the break in the abscissa and are numbered 1 through 37.

thereby complete the tag. The skater making the push then exited the floor, and the athlete who had entered the track completed the requisite number of laps before encountering another teammate exiting the relay box and entering the traffic lane to make the next tag. To be correct, the relay tag had to occur before a mark that was placed on the floor 5 m past the designated corner pylon. In addition, the tag had to be properly completed. If the skaters met but failed to execute a "push," or if one of the skaters fell upon making the tag, the trial was recorded as incorrect. The relay tags were recorded as correct or incorrect on each trial. Data were graphed as percentage correct.

Interobserver Agreement

Two observers simultaneously but independently recorded correct and incorrect tags during 8 of the 14 practice sessions during the first baseline and intervention. The records were compared trial by trial, and percentage agreement was calculated by dividing the total number of agreements by the number of agreements plus disagreements and then multiplying by 100%. Interobserver agreement ranged from 90% to 100%, with an average of 96.7%. Because agreement was consistently high, it was sampled on four practice sessions during the second baseline and intervention and did not fall below 90%.

Design and Procedure

The scheduling of relay racing was entirely at the coach's discretion. Aside from recording data and offering contingent verbal praise and postsession feedback during the intervention, experimenters deliberately avoided trying to modify the practice schedule in any way. The purpose of the intervention was to assess the impact of the treatment package within the regular skating environment.

The study used a multiple baseline across participants with a reversal design, conduct-

ed in two phases. The first phase included baselines with staggered interventions for 3 skaters (S1, S2, and S3). The second phase took place 6 months later. Baseline was reassessed and a second intervention was initiated concurrently for all 3 skaters. During the second phase, a 4th skater (S4) was introduced as a replication.

Phase 1. Baseline occurred during normal practices over a period of 3 months. Each participant was shown his or her baseline data and was given a verbal explanation of how to improve his or her relay tags. After the explanation, relay races were conducted. An experimenter shouted "good tag" or a variation along with the skater's name after each correct relay. At the end of each intervention session, the participant was shown his or her scores for that day, and specific instructions for executing correct tags were reviewed. Intervention continued until the end of the academic year. The experimenter providing the explanation and praise was a former competitive speed skater more senior than the other team members and familiar to them. The modal number of trials per practice was 10 (range, 7 to 10).

Phase 2. The second phase was initially designed as a 6-month follow-up to determine the maintenance of gains made in Phase 1. However, analysis of the data for S1, S2, and S3 failed to show lasting gains. Therefore, baselines were reestablished and the same interventions as described in Phase 1 were reinstated (simultaneously this time) for each skater. One additional skater (S4) was introduced as a replication of the initial findings for S1, S2, and S3. The modal number of trials per practice session remained at 10, but was more variable than in Phase 1 (range, 6 to 20).

RESULTS AND DISCUSSION

Figure 1 displays the percentage of correct relay tags exhibited by the 4 participants

throughout all baseline and intervention conditions. The numbers of correct tags increased for all skaters under treatment conditions. For S1, S2, and S3, Phase 2 results were more variable than those observed during Phase 1.

This study replicates and extends the findings of previous research on the effectiveness of behavioral treatments in sports (Allison & Ayllon, 1980; Buzas & Ayllon, 1981; Koop & Martin, 1983; Ward & Carnes, 2002). The failure of treatment effects to be maintained may be related to a number of variables. Phases 1 and 2 occurred at different times during the 10-month skating season, so uncontrolled variables may have introduced history and maturation effects. Fatigue did not appear to be a factor, given the absence of within-session changes. The value of experimenter praise may have changed across sessions and over time. Nonetheless, it appeared that a treatment package could

be used during regular practice sessions at least initially to improve inline skater performance. Future research might focus on the relative effects of specific treatment-package components and ways to maintain treatment effects.

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