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THE EFFECTS OF GOAL SETTING ON RUGBY PERFORMANCE

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Goal-setting effects on selected performance behaviors of 5 collegiate rugby players were assessed over an entire competitive season using self-generated targets and goal-attainment scaling. Results suggest that goal setting was effective for enhancing task-specific on-field behavior in rugby union.

DESCRIPTORS: goal-attainment scaling, performance, rugby, self-generated targets

Goal setting is one of the most thoroughly researched areas in management and organizational environments. Findings have consistently demonstrated that specific, difficult, and self-generated goals have more beneficial effects on performance than do easy goals, no goals, or "do your best" goals (see Locke & Latham, 1990, for a review). As a result of the robust observations from organizational settings, Locke and Latham (1985) suggested that the principles of goal-setting theory could be applied to the competitive sporting environment. Although several studies have attempted to apply goal-setting interventions with sports performers using single-case methods (e.g., Wanlin, Hrycaiko, Martin, & Mahon, 1997; Ward & Carnes, 2002), the results have been equivocal, and the reported effects have been well below those obtained in the management and organizational literature (see Burton, Naylor, & Holliday, 2001). These outcomes may be due, in part, to methodological limitations such as the selection of behaviors that are not generated by participants themselves, implementation of combined rather than single-skill packages, and the adoption of a limited number of observations of the dependent variable. Thus, the purpose of the current study was to address the existing methodological and conceptual limitations in the applied goal-setting literature by replicating and extending the goal-setting research to competitive rugby.

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METHOD

Participants

Participants were 5 male rugby union players aged between 21 and 24 years who were all starting players on a team competing in the National Collegiate Rugby Union Championships. All participants had a minimum of 10 years playing experience.

Response Measurement and Reliability

Five performance behaviors were measured in this study. *Number of ball carries* was used to determine the frequency of occasions a player attempted to gain yardage with the ball carried in hand. *Number of tackles* (either *made* or

missed) was used to assess the player's success or failure in preventing an opponent from carrying the ball. A *successful kick* was defined as a kick out of hand from a player with the aim of successfully putting the ball out of the field of play. Finally, *number of turnovers won* was used to measure the frequency of occasions a player managed to steal possession of the ball from the opposing team. All matches were videotaped by a trained technician and transferred to computer files on which the frequency of each behavior was calculated using a computerized notation system (Noldus Observer Video-Pro Behavioral Measurement Package; Noldus Information Technology, 1996).

Interobserver agreement was assessed by a second observer who analyzed the footage of the performance behaviors of six of the teams' matches randomly selected from the season. For each match the number of agreements on the occurrence or nonoccurrence of a response was divided by the number of agreements plus disagreements and multiplied by 100%. Mean interobserver agreement was 96% (range, 94% to 98%). Procedural reliability was assessed via a behavioral checklist to ensure that the goal-attainment scaling intervention (described below) was administered in a consistent manner. Across participants, the mean level of procedural reliability was 95% (range, 92% to 98%).

Procedure

The current study period covered 20 games over the course of an entire season. The baseline phase consisted of the first 10 matches of the season; the intervention was implemented at the midseason break, and the postintervention phase constituted the remaining 10 matches. Because the midseason was deemed a convenient time to implement the treatment, a nonexperimental (pretest–posttest) design was adopted to assess the effects of goal setting across the targeted performance skills. To indirectly evaluate experimental control throughout the analysis, data were also collected on nontargeted performance measures (based on the premise that only targeted behavior should change following implementation of the intervention; Kazdin, 1982).

The intervention consisted of three stages: goal determination, goal setting, and goal reviewing. In the goal-determination stage, each participant met with the lead researcher in the preseason period and indicated one aspect of his performance that could be targeted for improvement (e.g., tackles made). The frequency of each participant-selected performance behavior was then recorded for the first half of the competitive season. At the midseason break, the goal-setting stage of the intervention was administered. Based on the mean values for each participant's performance from the baseline phase, goal-attainment scaling was used to generate a series of numerical values for the targeted performance (Swain & Jones, 1995). Scaling consisted of a 5-point scale related to the frequency of each specific target response performed. Participants were asked to score their expected performance of each behavior over the second half of the season, ranging from the most unfavorable treatment outcome (−2), through the expected level of treatment success (0), to the best possible response to the treatment (+2). For example, if an expected level of outcome (0) for an individual was six tackles made, an unfavorable treatment outcome thought likely (−2) would represent two actual tackles made, whereas the best possible response to the treatment (+2) would represent a total of 10 tackles made.

In the goal-reviewing stage, the researcher met individually with the participants 48 hr before each match in the second half of the season, and reviewed the goal-attainment scaling scores for the target behavior. Throughout the season, the identity of the participants selected for the intervention was masked from the coaching staff, and they received no information regarding the athletes' self-selected targets.

Treatment effects were evaluated by comparing the relative percentage change in behavior

on targeted and nontargeted components during the first and second half of the season. Practical effectiveness was measured via a postintervention social validation questionnaire (available from the first author). Two of the team's coaches were also presented with the results and were asked to comment on participants' performances for both targeted and nontargeted behaviors, the perceived effectiveness of the intervention, and usefulness to the team. Differences in pre- and postintervention playing time and match outcome were also calculated to verify that changes in targeted and nontargeted behaviors were not a function of fluctuations in playing time and to determine whether team performance (i.e., wins) increased following the intervention.

RESULTS AND DISCUSSION

Results are presented in Figure 1. Participant 1 averaged 5.12 ball carries per game preintervention. This behavior increased to an average of 9.10 ball carries per game postintervention (i.e., a 77% increase). Participant 2 exhibited a change of 32% from pre- to postintervention for the number of tackles made (*M*s = 7.87 and 10.40 pre- and postintervention, respectively). Participant 3 demonstrated a desirable decrease in his targeted behavior (tackles missed) of 55% from preintervention ($M = 4.23$ tackles missed) to postintervention ($M = 1.9$ tackles missed). The target performance for Participant 4 showed a relative change of 26% from preintervention ($M = 8.7$ successful kicks) to postintervention ($M = 11$ successful kicks). Finally, Participant 5 demonstrated a relative change of 118% in turnovers won (*M*s = 1.33 and 2.90 pre- and postintervention, respectively). Thus, for all participants, postintervention performance showed a desired change in behavior. Moreover, all but 1 participant (Participant 5) performed above their goal-attainment scaling score (represented by a dashed horizontal line in Figure 1). Finally, although some changes occurred in nontargeted performance behaviors, these changes were usually smaller than those seen with the targeted behaviors.

Mean values for differences in percentage playing time pre- and postintervention ranged from −0.09% (Participant 5) to −2.65% (Participant 4) indicating that changes in performance were not associated with increases in playing time. Comparison of match outcome revealed a percentage win record of 50% preintervention and 70% postintervention. The average match score preintervention was 21 points for and 20 against, and was 30 points for and 20 against postintervention. These data, combined with the results of the social validation questionnaire, indicated that the intervention was effective in improving performance.

The current results replicate and extend previous research by Wanlin et al. (1997) and Ward and Carnes (2002) and suggest that goal-setting interventions can be effective for the enhancement of specific performance behaviors in rugby players. Although previous studies that have examined goal-setting effects on group behavior have found that setting specific targets can improve performance in practice and competition, no studies have examined the effect of individual behavior changes on team performance. In this study, the match outcome data (greater win percentage and an improved average score following intervention compared to baseline) indicate that team performances improved and suggest that self-selection of specific targets for improving individual performances may translate into an improvement in the team's overall performance.

The current data should be interpreted with caution for several reasons. First, the dependent variables were assessed by absolute (i.e., number of tackles made) as opposed to relative measures (e.g., percentage of successful tackles made). In a sport such as rugby, each behavior may have been affected by extraneous factors such as weather conditions, strength of opposition, and the number of opportunities to exhibit each

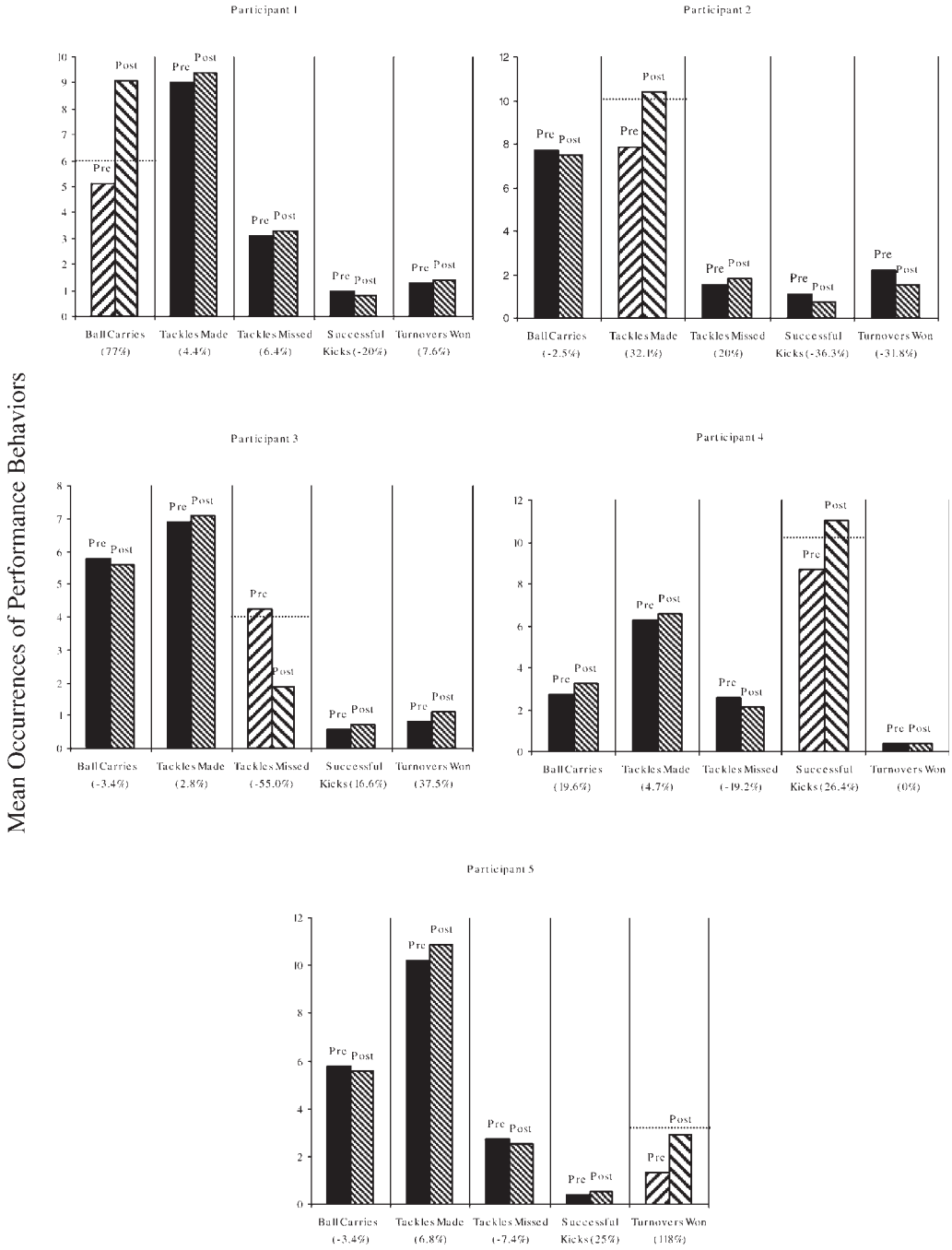

Figure 1. Mean occurrences of performance behaviors on targeted and nontargeted components pre- and postintervention for Participants 1 through 5. ▨ and ▧ bars represent targeted components pre- and postintervention, respectively. ▩ and ■ bars represent nontargeted components pre- and postintervention, respectively. Dashed horizontal lines represent the expected level of treatment success. Figures in brackets represent the relative percentage changes in performance behaviors pre- and postintervention. For the performance behavior of tackles missed, lower numbers indicate better performance.

behavior. Second, our study employed a nonexperimental A–B (pre–post) design, with treatment introduced at the same point for all participants. Thus, it is possible that threats to internal validity may have influenced responding throughout the course of the season. However, the nontargeted responses did not show a similar magnitude of behavior change, suggesting that the intervention was the primary variable responsible for a change in performance (Kazdin, 1982). Nevertheless, it should be noted that all nontargeted behaviors did show some change through the course of the season. Several of these changes would be expected, however, because they were related to the dependent variable (e.g., an increase in turnovers gained would be anticipated to lead to an increase in the number of tackles made). Future studies may consider using a multiple baseline design across participants or behaviors. Finally, the underlying mechanisms for behavior change related to performance improvement via goal-setting procedures were not directly evaluated in the current study. Possible mechanisms for these behavior-change agents within the context of goal setting may occur through the reinforcing or potential punishing effects of the consistent and objective performance feedback provided by goal-attainment scaling on subsequent game play.

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