*A BEHAVIORAL APPROACH TO COACHING FOOTBALL:
IMPROVING THE PLAY EXECUTION OF THE OFFENSIVE
BACKFIELD ON A YOUTH FOOTBALL TEAM*

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Because of the emphasis on winning, the difficulties involved in assessing performance, and the lack of frequent and contingent reinforcement, a behavioral approach to coaching football was used. The players, all nine- or ten-year-old males, were members of an offensive backfield on a Pop Warner football team. Three frequently-run offensive plays were broken down into a series of five behaviorally defined stages, permitting construction of checklists suitable for observing the players during both game and scrimmage sessions. The intervention consisted of the presentation and explanation of the appropriate checklist, and frequent contingent reinforcement in the form of feedback and recognition for instances of desired play execution. Performance gains averaging 20% occurred for each of the three plays after, and not before, the staggered introduction of each intervention. The results suggest that behavioral specification and positive reinforcement of desired play execution is a viable approach to the coaching of football.

DESCRIPTORS: physical education, sports, football, coaching, behavioral approach, reinforcement, multiple baseline, feedback, youths

Winning at all costs is a controversial but familiar phenomenon in athletic competition (Michener, 1976; Tutko and Bruns, 1976). Many observers of the sports scene have criticized this approach, particularly when young athletes are involved ("Dangers in sports", 1976; "How good are organized sports", 1971). As an alternative it has been suggested that coaches focus more attention on the players' development and improvement, rather than on the eventual outcome of the game (Tutko and Richards, 1971). Although it may be preferable to strike a balance between the competitive and the developmental-learning aspects of the game, relatively little guidance is available to coaches on how best to accomplish this aim. The overwhelming number of articles in coaching publications, such as the *Athletic Journal*,

are devoted to descriptions of different plays and practice drills.

Recently, several investigators in the area of physical education have suggested that operant principles can be applied in sporting settings (Liskevych and Thorsteinson, Note 1; McKenzie and Rushall, 1973; Rushall and Siedentop, 1972), and have demonstrated the use of such techniques in studies involving competitive swimmers (McKenzie and Rushall, 1974; Rushall and Pittinger, 1969). With a behavioral approach, it might be possible to combine the competitive and the learning aspects. Coaches could better specify and provide positive consequences for the performance of desired behaviors. The learning of fundamentals and the improvement of skill execution would be facilitated. Players could see how they had progressed, apart from the eventual outcome of a given game.

One of the problems with the game of football, however, is that it is difficult to assess performance. The execution of plays is a complex activity requiring coordination of actions among

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players and against an opposing defense. None of the traditional indices—win-loss records, yardage gained, points scored—provide a sensitive measure. Instead, they reflect many factors (e.g., quality of the opposition) of which the performance of a given line or individual is only one. And in some cases, these indices are misleading; for example, the immediate reaction to witnessing a winning 50-yard pass in the last few seconds of the game sometimes overshadows a team's relatively mediocre performance throughout the rest of the game.

Another related difficulty is the lack of frequent and contingent consequences. Many instances of desired skill execution are ignored because points are scored and yardage is gained in only a fraction of the plays attempted. Winning is at best a one-shot type of reinforcement (Williams and Long, 1975). Other consequences have been suggested, including recognition and praise (Parseghian, 1967), visible incentives in the form of embossed phrases displayed on helmets (Stevens, 1974), and feedback on game and practice films (Gentile, 1975; Tutko and Richards, 1971). However, these consequences are usually neither frequent enough nor specific enough to ensure that players experience many instances of reinforcement.

In the present study, a behavioral approach was used when coaching the offensive backfield of a youth football team. Three frequently-run plays were each broken down into a series of five stages and then each stage was described in behavioral terms. Using this measure of performance, both the coach and the players were able to assess and provide frequent and contingent consequences for instances of desired play execution.

METHOD

Subjects and Setting

The target subjects consisted of five 9- and 10-yr-old males on a Pop Warner football team. They were the quarterback (QB), fullback (FB), right halfback (RHB), and left halfback

(LHB), composing the offensive backfield, and the center, who was primarily involved in the initial ball exchange. All players had at least 1 yr experience, with three of the five returning to play the same position. The backfield coach, the second author, was a 23-yr-old male who had helped coach Pop Warner teams the previous two seasons.

Each week the team played one game and practised three times (Monday, Tuesday, and Thursday) for 90 min. At least half of each practice session was spent in scrimmage situations in which the backs went through plays with opposition. At the beginning of the study, the team had already played three games and met for 13 practice sessions.

Performance Measure

The coach first selected three offensive plays. Because a multiple-baseline design across plays was used, an effort was made to choose plays independent of one another. Instead of three variations of the same basic play, plays that necessitated different strategies on the part of the players were chosen. All run out of a wishbone set,² the first was an option play (Play A), the second a power sweep (Play B), and the third an off-tackle counter-play (Play C). Refer to Figure 1 for diagrams of Plays A, B, and C, respectively.

After selecting the plays, the coach broke down each play into five stages. These stages corresponded to the various actions in each play and were judged to be crucial to the execution of each play. Once the stages had been delineated, the coach described both the desired movements and the conditions (S^ps) under which the actions should be carried out for each stage. For a description of the stages of Play A, refer to Table 1. In Play B, the five stages included the (1) QB-Center Exchange, (2) QB Spin and Pitch, (3) RHB and FB Lead Blocking, (4) LHB Route, (5) QB Block; in Play C,

²For further information, refer to Pepper Rodgers and Homer Smith's *Installing Football's Wishbone T Attack* (1973).

Play A: Option play

Play B: Power sweep

Play C: Off-tackle counter play

Fig. 1. Diagrams of Plays A (option play), B (power sweep), and C (off-tackle counter play).

the stages included the (1) QB-Center Exchange, (2) RBH Fake and QB Spin, (3) FB Lead Block, (4) LHB Counter Step, and (5) QB Handoff and LHB Run, respectively.³

³Descriptions of stages for Plays B and C are available on request.

Observations were made during seven scheduled games and 17 scrimmage sessions over a seven-week period on 24 different days (exclusive of two days of inclement weather). During every game and scrimmage session, each of the plays was run at least once and as often as four times. Before each play, the quarterback

Table 1

Descriptions of Stages for Play A, Option Play

1. *QB-Center Exchange*
On the correct count, the center "snaps the ball", *i.e.*, raises the ball between his legs and quickly places the ball in the hands of the quarterback (QB). The QB should have the ball firmly in his hands.
2. *QB-RHB Fake*
With the ball in his hands, the QB moves quickly down the line as the right halfback (RHB) goes toward the middle of the line. The QB fakes a hand-off to the RHB, *i.e.*, places the ball in the RHB's hands. As the RHB bends over and runs low appearing to have the ball, the QB pulls the ball back and continues going down the line.
3. *FB Blocks End*
The fullback (FB) sprints toward the defensive right end, watching his position. Depending on the depth of the end, the FB either blocks or passes him by. If the end penetrates three yards (2.7 m) beyond the line of scrimmage, the FB passes him by and turns upfield to block another defensive player. If the end penetrates less than three yards, the FB blocks him away from the QB and drives him out of the area of the play.
4. *QB Decision to Pitch or Keep*
After the QB-RHB fake, the QB continues moving down the line, watching the defensive right end. If the end has been passed by the FB, the QB keeps the ball and turns upfield. If the end has been blocked by the FB, the QB pitches, *i.e.*, tosses, the ball to the LHB and turns upfield to block.
5. *QB Action*
Whatever decision is made, the backs should proceed as described. If the QB decides to keep the ball, he should quickly turn upfield following on the heels of his blockers. The LHB should turn upfield trailing the QB. If the QB decides to pitch, he should pitch the ball to the LHB slightly in front of him and chest high. The LHB should be positioned to the right of and behind the QB, keeping his eyes on the QB. Once the LHB catches the ball, he should turn upfield following his blockers.

ran to the sidelines to confer with the coach as to which play was to be executed. Whenever the coach signalled Play A, B, or C, the back-field coach checked whether or not each stage had been completed, using the appropriate five-stage checklist. Refer to Table 2 for the checklist for Play A. The percentage of stages successfully completed was computed as the number of stages checked divided by the total number of stages (5) and then multiplied by

Table 2

Sample Checklist for Play A, Option Play

Stages	Trials		
1. QB-Center Exchange	✓	✓	✓
2. QB-RHB Fake	✓	✓	✓
3. FB Blocks End	✓		✓
4. QB Decision to Pitch or Keep			✓
5. QB Action	✓	✓	✓
% Score	80	60	100

100. When all of the stages were successfully completed, yielding a score of 100%, the play was considered to be executed perfectly.

Interrater Reliability

Interrater reliability was assessed by the backfield coach and another coach (either the head or the assistant coach) each time the plays were run, beginning with the third observation day. Of 173 total observations, there were 162 reliability checks. Before assessing interrater reliability, the coaches discussed the written descriptions of the various stages with the back-field coach. After each game or scrimmage session, the data were checked stage-by-stage. Interrater reliability was computed using the percentage agreement method as the number of agreements divided by the number of agreements plus the number of disagreements and multiplied by 100. An agreement was noted when *all* stages of the play were identically scored. By requiring that the raters agree on the occurrence or nonoccurrence of all five stages of each play, a very conservative estimate of reliability resulted. If the raters differed on any stage of the play, a disagreement was scored.

For Play A, reliability was 87.3%; for Play B, 90.9%; and for Play C, 89.0%. Of 162 plays the raters agreed on 143, for an average reliability of 89.1%. That is, the raters agreed as to the presence or absence of each of the five stages in each play approximately 90% of the time. When disagreements occurred, the raters almost always (with one exception) agreed on four of the five stages, with a difference on just

one of the stages. The occurrence of each instance of interrater disagreement is noted in Figure 2.

Design

A multiple-baseline design across plays was used. Baseline observations were taken on the three plays and the intervention introduced for each play at one-week intervals—after 10 observation days (three games and seven practice sessions) for Play A, 14 days (four games and 10 practice sessions) for Play B, and 18 days (five games and 14 practice sessions) for Play C.

Procedure

At the beginning of the season, the coach distributed to the players a play book that included diagrams (similar to those in Figure 1) of approximately 30 plays, with instructions to commit the plays to memory. During every practice session, lasting 90 min, the backs spent from 45 to 60 min practising plays with opposition. Before the scrimmage portion of practice, the backs worked on fundamentals and conditioning skills, listened to instruction, and walked through individual plays without opposition.

During baseline the coach verbally described plays, referring to the play diagrams. When the backs went through plays by themselves, the coach typically offered suggestions from the sidelines. During scrimmage sessions, the primary feedback consisted of what was done incorrectly and what could be done to improve the next time.

For the intervention, several potentially reinforcing consequences were arranged for desired skill execution, and the desired executions were clarified. During the first intervention, emphasis was placed on Play A. No mention was made of Plays B or C until the second and third interventions, respectively. At the first practice session of the intervention phase, the coach presented the backs the appropriate checklist, explaining and giving the rationale behind each stage (10 to 15 min). As the backs

walked through the plays by themselves, the coach modelled what some of the desired movements and S^D s were (10 to 15 min). For the fourth stage of Play A, for example, the coach played the position of the defensive end and showed the quarterback how to decide whether to pitch or to keep the ball, depending on the position of the defensive end. Later in the season, the backs individually walked through plays as they had earlier during the season, and the coach continued to demonstrate as necessary. During the scrimmage sessions, feedback and recognition were given immediately. After each play, the players ran over to the coach, who was standing on the sidelines, to verify how they had done. The coach showed them how he had scored the checklist. In addition to pointing out what had been done incorrectly, the coach also noted what stages had been completed successfully. For game situations, feedback and recognition were given during the first practice session following the game. The coach showed and discussed how he had scored their performance on the checklists. Praise was given for the stages executed well, in addition to explanations as to why each stage was or was not completed successfully.

RESULTS

Backfield Performance

The percentage of stages successfully completed by the backfield during baseline and intervention phases is shown in Figure 2. Performance increased after, and not before, each intervention was introduced. After each intervention, the mean level of performance substantially improved for Play A from 61.7% to 81.5%, for Play B from 54.4% to 82.0%, and for Play C from 65.5% to 79.8%.

During baseline, the players rarely executed the selected plays perfectly, either in practice or game situations. Perfect executions (100% scores) were obtained only twice in 84 total attempts for Plays A, B, and C. However, after intervention the percentage of perfect execu-

Fig. 2. Percentage of stages successfully completed for Plays A, B, and C during practice (M = Monday, T = Tuesday, Th = Thursday) and game (G) situations. Each data point refers to the execution of a single play. The open circles refer to instances of disagreement between the observers.

tions increased substantially. The number of plays in which all of the stages were successfully completed increased to 22 of a possible 89 attempts. More dramatic, perhaps, is the fact that following intervention execution fell below 60% only once, whereas during baseline sub-60% scores occurred 16 times in 84 attempts. The reduction in the number of sub-60% scores was particularly noticeable during game situations. During baseline game situations, there was a total of nine sub-60% scores in 23 attempts. In contrast, during the intervention there were no sub-60% scores in 29 attempts.

While all of the players improved the execution of individual stages, it was particularly interesting to note the improvements in performance of the quarterback. During baseline, his proficiency rate for the decision to pitch or keep was only five successful trials of a possible 23. After intervention, the number of correct decisions rose to 26 of a possible 40 at-

tempts. During baseline, the quarterback never once accomplished the quarterback block; however, following intervention he successfully blocked 22 out of 30 attempts.

DISCUSSION

The results suggest that behavioral specification and positive reinforcement of desired play execution is a viable approach to the coaching of youth football. Using five-stage checklists, both the coach and the players learned to assess performance irrespective of the eventual outcome of the game. Players were rewarded contingently and frequently in the form of feedback and recognition for instances of desired play execution. Performance gains averaging 20% occurred for each of the three plays after, and not before, introduction of the staggered interventions. One might expect that as the players obtained more experience over the season their performance would gradually improve. How-

ever, it was not until the interventions for Plays A, B, and C that the players were able to execute these plays consistently.

By conceptualizing performance in the form of five-stage checklists, it became clearer to both the players and the coach what steps were involved in every play. When formulating the checklists, the coach found that the essential stages were not immediately apparent, even to him. Only after considerable thought was he able to pinpoint the crucial components of each play. The behavioral specification also enabled the coach better to explain what was expected, with the result that the players had a much clearer idea of what, when, and how they were supposed to act on the field. The players themselves became intrigued with the checklists, familiarizing themselves with them to the point of extended discussions about fine points of the various stages.

The five-stage checklists were also helpful in that they facilitated the delivery of consequences. A quick glance made it clear what stages had been executed well and what stages needed improvement. The coach was particularly pleased because he avoided the punishment syndrome prevalent in many coaching circles. Instead of pointing out only the errors, he rewarded players for performing well. Another advantage of the procedures used was that each player could better evaluate his own performance. The coach thought this skill was particularly important—when the team won in spite of their mediocre performance and when the team lost even though they had played well.

The direct observational method of measurement resulted in a measure of performance that was sensitive and reliable. The interrater reliability figures were consistently high throughout the study, especially considering the fact that raters had to judge complex, and in some cases simultaneous, interactions. Unfortunately, however, both the primary observer and the persons doing the reliability checks were either involved in or aware of the experimental manipulations. To minimize observer bias in future studies,

it is recommended that at least one of the observers be unaware of the experimental conditions.

This study has many implications for persons involved in youth sports programs. By combining the competitive and the developmental-learning aspects, coaches may be able to help young athletes acquire and develop skills in a positive manner without an overemphasis on the eventual outcome of each game. By directly observing the backfield as they executed selected plays and noting whether or not the behaviorally-defined stages were successfully completed, it was possible to reflect and reinforce performance of the players.⁴ Because an alternative measure of performance was available, winning and losing could be put in better perspective. One of the reasons that the eventual outcome is so highly stressed may be related to the difficulties typically involved in judging the performance of football players.

The techniques can be incorporated within normal coaching practices and do not require extensive equipment or time commitments. In the present study, the coaches, normally available during game and scrimmage sessions, observed the backfield and served as interrater reliability checks. Because the checklists made it immediately apparent how players had performed, feedback and recognition could be administered without considerable time or delay.

Because the intervention included a combination of at least three procedures, it would be interesting to assess whether the presentation and explanation of the checklists, the feedback, the recognition for instances of desired play execution, or some combination is crucial. Another research possibility is to investigate whether a behavioral approach to coaching can be adapted to different plays, with a greater percentage of the team, to other sports,

⁴Unfortunately it was not possible to assess the relationship between the behaviorally defined checklist system used in the present study and the number of yards gained per play because of difficulties encountered in relocating the appropriate records.

and to high-school and college-level players. Although further research is definitely warranted, this study indicates some of the potentials of a behavioral approach to coaching.

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