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ABSTRACT

This study employed a classwide peer recording (CWPR) program to demonstrate the efficacy of peers as behavior change agents in a physical activity setting. The study sought to determine whether or not the frequency of stimuli conditions presented by a game changes when a CWPR procedure is in effect, and whether or not the frequency of actual responses to the stimuli changes under these circumstances. The quality and/or accuracy of actual responses and their rate of success were also examined. The subjects were 4 college students in a class of 18 students enrolled in an advanced soccer class. The four peer recorders were trained in the use of the Pioneer Instrument for Measuring Soccer Playing Ability in Regular Setting (PIMSPARS) following baseline conditions. Results revealed that the introduction of the CWPR procedure produced immediate change and gains in the frequency of actual responses for all subjects. Withdrawal of the CWPR procedure produced a consistent decrease in behavior patterns for all subjects. These findings indicate the effectiveness of peers as behavior change agents in improvements in motor behaviors in physical activity settings. The instrument used in the study is appended, and behavior changes are illustrated in charts. (JD)

Use of a Classwide Peer Recording Program to Enhance the Quality and Accuracy of Responses of Physical Education Majors in a Physical Activity Class

Running head: CWPR program

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Introduction

The use of peers as behavior change agents in teaching and learning environments has received considerable attention in the research literature. Peer tutoring has produced positive effects in student performance in spelling, reading, and mathematics at the elementary school level (Maheady & Haper, 1987; Delquadri, Greenwood, Stretton, & Hall, 1983; Greenwood, Dinwiddie, Terry, Wade, Stanley, Thibideau, & Delquadri, 1984). Peer monitoring has also been used to increase the quantity of feedback provided during student teaching in physical education (Dodds, 1979, 1989).

Although research efforts have proven the usefulness of peers as agents for behavior change in student teaching and classrooms, validation and application of peer programs in physical activity setting is extremely scarce. This study employed a classwide peer recording (CWPR) program to demonstrate the efficacy of peers as behavior change agents in a physical activity setting. Specifically, this study attempted to answer the following questions: (1) does the frequency of stimuli conditions presented by a game change when a CWPR procedure is in effect? (2) does the frequency of actual responses to the stimuli conditions presented by the game change when a CWPR procedure is in effect? (3) does the quality and/or accuracy of actual responses change when a CWPR procedure is in effect? and (4) does rate of success of the actual responses change when a CWPR procedure is in effect?

Method

Subjects

Four college students participated in the study. They were part of a class in advanced soccer at the State University of New York, College at Brockport. The class was offered in the Fall Semester 1989 and consisted of ten male and eight female students. All the students possessed intermediate competency in soccer prior to enrollment in the course. They were all physical education majors except one. The average age of the class was twenty-two.

Experimental procedure

The subjects were observed under baseline and peer-recording conditions. For Naomi and Daniel, the change from baseline to peer recording was made according to the time-lagged procedure required by a multiple baseline (across subjects) design; so that they could enter the treatment conditions as soon as possible. The interventions for John and Ryan were introduced at the same time. All other phase changes across all four students were instituted at the same time in a withdrawal (A-B-A-B) design. A fade was instituted following the second treatment. The peer recording procedure was withdrawn according to a sequential withdrawal design (Rusch & Kadzin, 1981). The instructor told the students that peers would no longer observe and record data on performance in the games.

Data recording procedure

Peer recorders were trained in the use of the Pioneer Instrument for Measuring Soccer Playing Ability in Regular Setting (PIMSPARS) (Ocansey, 1989) following baseline conditions. The mean and range of inter-recorder agreement was 84(80-100) percent. A sample of the PIMSPARS instrument is provided in Table 1. Definition of the key behaviors is provided in Appendix 1 and the observation procedure for using the instrument is provided below.

Insert Table 1 about here

First, recorders identified the occurrence of stimuli conditions presented by the game as designated by the numbers under "OTR" (opportunity to respond) on Table 1. Thus, all conditions presented by the game for responding were identified and recorded.

Second, the recorder determined whether the student reacted to the condition presented by the game. If there was no reaction following the occurrence of the condition presented by the game, the recorder placed "X" under "IG" to show that the condition was ignored. An example is shown below.

OTR	IG	BS	A	IA	S	US
1	X					

Third, the recorder placed the symbol for the behavior that was ignored under "BS" (behavioral symbol). For example, "DS" for a game condition that required a defensive save to be emitted.

OTR	IG	BS	A	IA	S	US
1	X	DS				

On the other hand, if a defensive save was made then, the recorder placed "DS" under behavioral symbol as shown below.

OTR	IG	BS	A	IA	S	US
1		DS				

Fourth, the recorder determined the appropriateness (accuracy) behavior. Is the response appropriate and/or congruent with regard to the condition presented by the game? The recorder placed "X" under "A" if the response was appropriate or under "IA" if the response was not appropriate. An example is provided below.

OTR	IG	BS	A	IA	S	US
1		DS	X			

Fifth, the recorder determined the result (product) of the response and placed "X" under "S" if the response was successful or under "US" if the response was unsuccessful. The complete recording for one observation is provided below.

OTR	IG	BS	A	IA	S	US
1		DS	X		X	

For this observation the student recognized the stimulus presented by the game and then made a defensive save that was appropriate and/or congruent with regard to the condition presented by the game. In addition, the defensive save was done successfully.

Results

The results are presented in Figure 1 and 2. The data in Figure 1 reveal inconsistent and generally low levels of stimuli presented by the game during baseline conditions. By contrast, the frequency of actual responses emitted by students remained consistently low for all subjects. Under the subsequent CWPR procedure, the data for stimuli presented by the game show an increasing trend for John and Ryan. Whereas, Naomi and Daniel's data under the CWPR procedure show very minimal change. By contrast, the introduction of the CWPR procedure produced immediate change and dramatic gains in the frequency of actual responses for all subjects.

The withdrawal of the CWPR procedure produced immediate and consistent decrease in behavior pattern for all subjects. Infact, the data under the withdrawal phase resemble baseline conditions. The reintroduction of the CWPR procedure produced immediate change and consistent high levels that replicate the first CWPR phase. The increase remained constant when the CWPR procedure was faded. The mean frequency of stimuli presented by the game was 20 during baseline conditions, and 32 during CWPR procedure phases. The mean frequency of actual responses to stimuli conditions presented by the game was 15 during baseline conditions, and 30 when the CWPR procedure was in effect.

Insert Figure 1 about here

The data in Figure 2 reveal consistent and generally low rates of actual responses during baseline conditions. Similarly, the rate of successful response remained consistently lower for all subjects. Under the subsequent CWPR procedure, the data reveal immediate and dramatic increase for all subjects. The withdrawal of the CWPR procedure produced immediate decrease in behavior pattern for all subjects. Although, the data for Daniel, John, and Ryan show immediate decrease under the withdrawal phase, the levels of successful response were slightly higher than baseline.

The reintroduction of the CWPR procedure produced immediate and consistent increase for all subjects. The data, percent of actual response, replicate the first treatment results. The data also show superior levels compared to those in the preceding CWPR procedure phase. The increase remained constant when the CWPR procedure was faded. The mean percent of successful response was 29.8% during baseline conditions, and 72.9% during CWPR procedure phases.

Insert Figure 2 about here

Student satisfaction regarding the CWPR procedure was determined by a seventeen item questionnaire administered to each student. This questionaire, the Peer Recording Evaluation Inventory, is an adaptation of the Peer Tutoring Evaluation Inventory (Meheady & Harper, 1987). Students were asked to evaluate the effectiveness of CWPR in improving their ability to play in modified soccer games. The students indicated that the

CWPR kept them alert and they reacted more frequently and accurately during the game. As one student noted "I worked more and enjoyed the game with the CWPR".

In addition, students reported on the extent to which they enjoyed CWPR and the game. The students perceived improved playing ability and positive social benefits when the CWPR procedure was in effect. Students rated specific components of the peer recording instrument very high. They also indicated that the peer recording program helped them to learn.

Discussion

The result of this study extends the effectiveness of peers as behavior change agents from exclusive improvements in specific academic content areas to improvements in motor behaviors in physical activity setting. Specifically, the results of this investigation provide support to a considerable amount of previous research on peer intervention programs (e.g., Dodds, 1976, 1989). A consistent finding has been that the use of data recording instruments by peers help students to respond correctly.

An important aspect of this investigation is that it demonstrates the effectiveness and efficiency of an observation instrument that was relatively easy to learn and to implement. Realizing the persistent need for observation of the quality of motor performance in natural or regular settings (e.g., Godbout & Schult, 1983), this instrument provides a vital contribution for

instructional practice and a preliminary tool for future investigations.

A limitation of the present study pertains to the absence of a functional analysis of the impact of the separate components in the present design. Future research that delineates and includes the direct components of the instrument might contribute to an improved understanding of the manner in which peer recording using this instrument facilitates improvements in analytic behavior and playing ability in natural setting.

The data from the last withdrawal phase indicates that students can continue to perform at high levels after treatment is removed. However, myriad questions about maintenance remain unanswered: For how long do these effects persist? What features of the treatment are critical to the maintenance of the effects? Do peer recording and modified game conditions contribute differentially to the effects?

From practical perspective, this study and the study by Dodds (1979) indicate that peer recording and/assessment procedures have applicability in physical education and other settings. It is apparent that further work in refining and expanding peer recording techniques can contribute significantly to improved technologies to enhance learning.

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Table 1

The Pioneer Instrument For Measuring Soccer Playing Ability In Regular Setting

STUDENT: _____ RECORDER: _____
DATE: _____ TIME: _____ to _____
GAME TYPE: _____

Key Behaviors
RP- Relocating for a pass H- Hustling S- Shooting
DR- Defensive Relocation P- Passing T- Trapping
M- Maneuvering & Faking A- Assisting DS- Defensive Save

Assessment Keys
OTR- Order of Response BS- Behavioral Symbol I- Ignore
A- Appropriate S- Successful US- Unsuccessful
IA- Not Appropriate

OTR	I	BS	A	IA	S	US	OTR	I	BS	A	IA	S	US
1							16						
2							17						
3							18						
4							19						
5							20						
6							21						
7							22						
8							23						
9							24						
10							25						
11							26						
12							27						
13							28						
14							29						
15							30						

Summary Report

OTRs = ____ Actual responses = ____ I = ____

Ratio of OTR/Actual response = ___/___

A = ____ IA = ____ Ratio of A/IA = ___/___ Percent of A= ___%

S = ____ US = ____ Ratio of S/US = ___/___ Percent of S= ___%

key behaviors

RP = _____ DR = _____ M = _____ H = _____ S =_____

T = _____ A = _____ DS = _____ P = _____

Data interpretation and prescription

1. Tactic - process - congruency

2. Technical - process - congruency

3. Technical- product - congruency

4. Tactic - product - congruency

Appendix 1

Definition of key behaviors

Relocating for a pass

Movement into open space in anticipation of a pass from a team mate. It also involves deliberate or intentional movement into open space to create opportunity for passing. Give-and-go passes are included in this category.

Defensive Relocation

Movement toward player's own goal area to help on defense. This category does not include hustles to regain possession of a ball immediately after the ball has been lost to an opponent.

Hustling

Attempt to gain or regain possession of the ball from an opponent. This category includes tackling a player to gain possession of the ball or to regain possession of the ball immediately after the ball has been lost to an opponent.

Shooting

Attempt to send the ball through the goal by kicking with either the left foot or the right foot or the head for the purpose of scoring a goal.

Passing

Attempt to send a ball to a team mate by kicking using either the left foot or right foot and other parts of the body except the hands. Use of the head, chest, thigh, knee, shin in sending the ball to a team mate are included in this category. This category does not include a pass that eventually results in a successful shot at goal by another team-mate.

Trapping

Attempt to receive a ball [from a throw-in or a kick] with any part of the body (except the hands) so that, the ball remains within playing reach of the player. A trap is unsuccessful if the player takes more than a step to recover the ball during trapping.

Assisting

A pass to a team mate that preceeds a successful shot at goal. The ball may be passed by kicking with either the left or right foot and other parts of the body except the hands. Use of the head, chest, thigh, knee, shin in sending the ball to a team mate are included in this category.

Maneuvering and Faking

An attempt to create illusions with body movements that causes an opponent to either hesitate, take eyes of the ball, or temporarily upset balance. This act places an opponent at a momentary disadvantage as a result of the illusion caused by body movemer .s.

Defensive Save

Any attempt by a player to stop a shot at goal with any part of the body except the hands. All goalie actions intended to prevent the ball from scoring are included in this category.

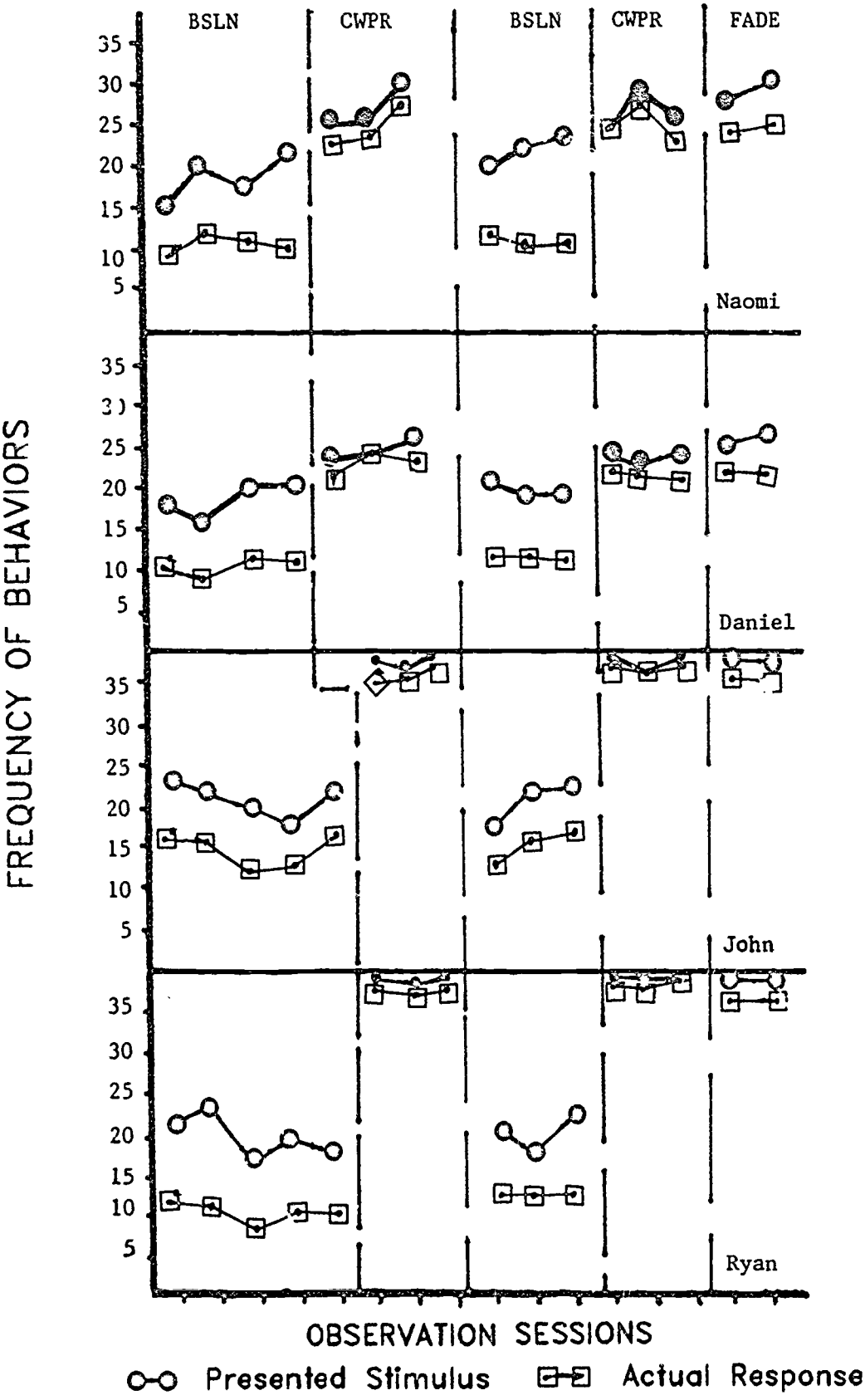

Figure 1. Relative difference between frequency of stimulus presentation and actual student responses in ten-minute modified soccer games during baseline and intervention.

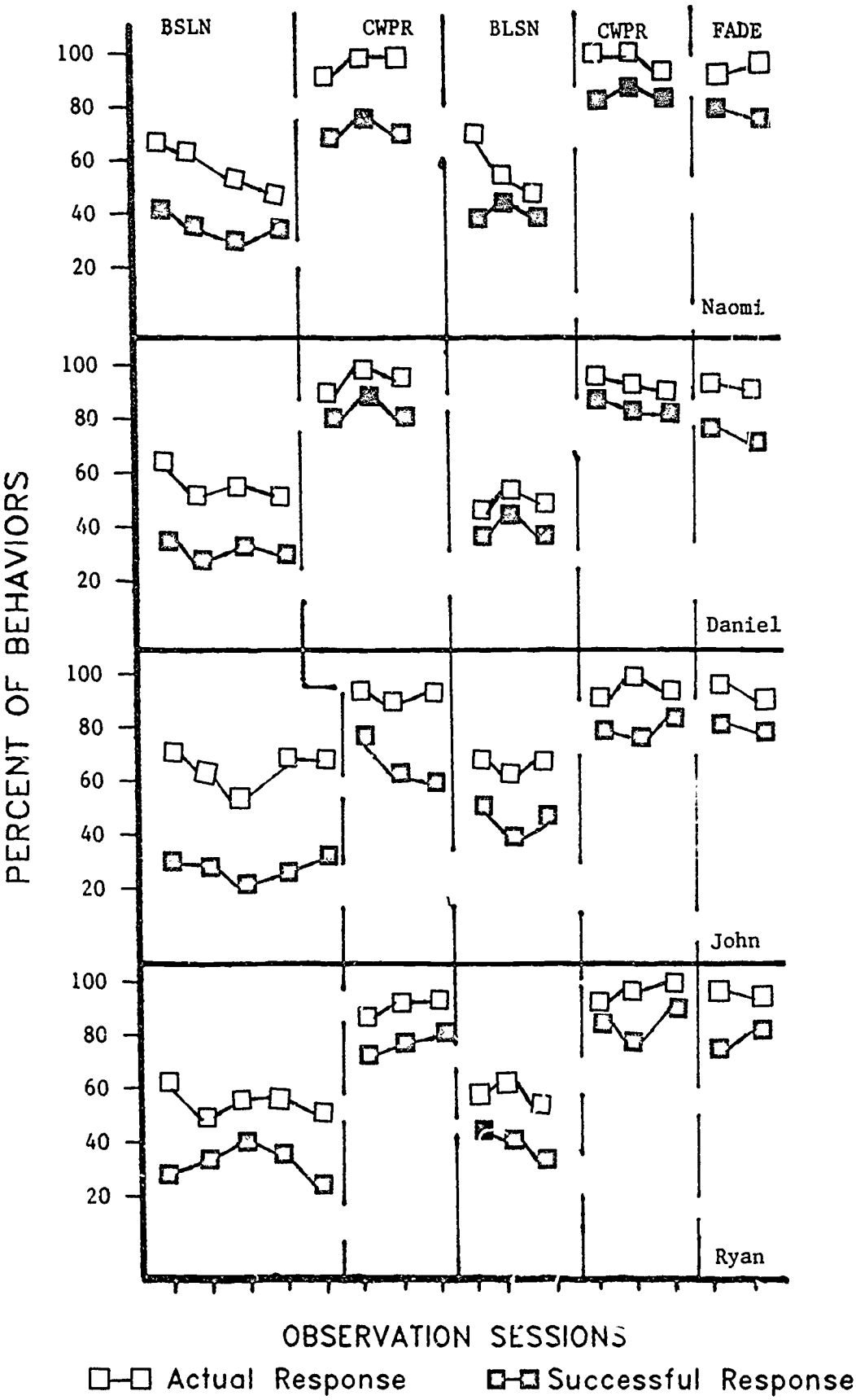

Figure 2. Relative difference between percent of actual responses and success rate of responses in ten-minute modified soccer games during baseline and intervention.

Appendix 16

END

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