## ABSTRACT

SCHAUER, A. T. Comparing the effectiveness of constant task and task variation teaching methods when working with adolescents who have behavioral disorders. MS in Exercise and Sport Science-Special Physical Education, August 1998, 41 pp. (P. DiRocco).

The purpose of this study was to determine which teaching method, constant task (CT) or task variation (TV), would best improve the sport specific skill level of adolescents with behavior disorders. Twelve adolescent students with behavioral disorders were placed into 2 groups of 6 subjects. The 2 subject groups were then scored quantitatively and qualitatively on specific bowling skills. The mean scores of the 2 groups were then compared using a parametric t-test. No significant difference between the CT and the TV groups' prettest mean scores was found. Both groups underwent an 8 session, 4 week bowling skills program. The CT group was taught using a method which solely concentrated on a bowling task for the entire 45 minutes of class. The TV teaching method involved rest periods or alternate learning activities, at 9 minute intervals, into the 45 minute sessions. At the end of the 8 session program the 2 groups were again tested by quantitative and qualitative measures. Each individual group had their pretest and posttest mean scores compared using a parametric t-test to determine the existence of any significant improvement. A .05 level of confidence was the acceptable alpha level. The mean scores of the CT and TV group posttests were analyzed to determine if one group showed any significant amount of skill development over the other. The hypotheses of the experimenter were that both teaching methods would elicit skill improvement, and that the TV method would be more efficient than the CT teaching method. The results of the statistical analyses performed on the mean scores of the two groups' pre and posttest accomplishments supported the hypotheses.

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# COMPARING THE EFFECTIVENESS OF CONSTANT TASK AND TASK VARIATION TEACHING METHODS WHEN WORKING WITH ADOLESCENTS WHO HAVE BEHAVIORAL DISORDERS

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# CHAPTER I

## INTRODUCTION

A study performed by Weber and Thorpe in 1992 compared the use of a constant task (CT) teaching method and a task variation (TV) teaching method when working with children with autism. The study followed an experimental pattern similar to one used with autistic children in a classroom setting (Dunlap, 1984). Since Dunlap's (1984) study showed the task variation method to be more effective in the classroom, Weber and Thorpe (1992) hypothesized that this would also be the case when teaching gross motor skills to children with autism in a physical education setting.

The results of Weber and Thorpe's (1992) study again showed that the TV teaching method was superior to the CT teaching method when working with adolescents with autism. They theorized that this was the case because of the short attention spans possessed by most individuals with autism along with their characteristic of distractibility (Durrant, 1993).

The reviewing of these two experiments (Dunlap, 1984; Weber & Thorpe, 1992) brought about the question of which method would work best with other disability populations. One population that possesses similar distractibility characteristics as individuals with autism are that of students with behavioral disorders.

Persons with behavior disorders normally exhibit short attention spans, disassociation, disregard for themselves or others, and a potential for violent outbursts (Gerber, 1996; Horvat & Kalakian, 1996; Morgan, 1988; Nelson, 1996; Smith, 1989).

## Need for the Study

The results of a study such as this could assist educators in the development of programs to be used with the population of students with behavioral disorders. Finding the most effective way of instructing these individuals would benefit the adolescents themselves by allowing them to experience successes they may not have felt were possible (Weiss, 1993). These successful experiences could help in subduing some of their more detrimental characteristics such as violent outbursts and disregarding the safety of themselves or others.

It has been observed in earlier studies (Bar-Eli, Hartman, & Levy-Kolker, 1994; Collier & Reid, 1987; King & Dunn, 1989) that most teachers without training in regards to working with students with special needs feel somewhat uncomfortable and unprepared in this type of educational setting. A study such as this could help educators enhance their understanding of the most appropriate methods for serving students with behavior disorders. This study may also shed light on the matter of which teaching methods are most effective for handling those who have a behavioral disorder along with reasons why certain educational strategies are more efficient at eliciting skill improvement.

## Purpose of the Study

The purpose of this study was to determine if the CT teaching method or the TV teaching method was more effective at improving the sport specific skills of adolescents with behavior disorders.

## Hypotheses

The following hypotheses were proposed for this study:

1. Both the constant task and the task variation subject groups would exhibit significant skill improvement during their eight session training unit.
2. The task variation subject group would experience a significantly greater amount of skill enhancement than the constant task group.

## Definition of Terms

The following definitions were applied to this study.

Constant Task Teaching Method- A method in which a task was presented repeatedly until the skill was learned or until the class period elapsed (Dunlap, 1984).

Task Variation Teaching Method- A method in which the practice time is periodically interrupted by the injection of either rest periods or alternate learning activities.

## CHAPTER II

## REVIEW OF RELATED LITERATURE

### Behavior Disorders

Individuals who exhibit such characteristics as a lack of appropriate social behavior (Collier & Reid, 1987), potential for violent outbursts, and functional impairments (Clarizio & Klein, 1995) are often classified as being behaviorally disordered. A student with this condition can jeopardize the balance that is required in a learning environment. It is necessary for students to understand what are appropriate and what are inappropriate classroom behaviors. Without the proper give and take, the potential for effective learning to occur in an educational setting is hampered. To enhance learning for these students and to improve the learning environment for their classmates, there must be a greater understanding of variables that are associated with successful teaching of children with behavioral disorders (Clarizio & Klein, 1995).

According to Haywood (1986), a problem that many individuals with behavior disorders have is a low self-esteem. This low self-concept or level of appreciation can be the outcome of a variety of factors. Self-esteem, in itself, is the personal judgment of your own capability, significance, success, and worthiness, which is conveyed to others by words and actions (Haywood, 1986.) The outlook that an individual has of him or herself is derived over time by social interactions, whether that be with parents, teachers, coaches,

or peers, as well as through personal accomplishments, successes, and perceived failures (Haywood, 1986).

We could then assume that individuals with behavior disorders could have some of their more disruptive and unacceptable social actions subdued by raising their self-esteem. For this to occur it would be necessary for these individuals to experience consistent successes. Physical activity has been related to improvements observed in areas such as self-image and life satisfaction (Bar-Eli, et al, 1994). Persons with behavior disorders may have chronically disruptive influences on learning environments. Typical disruptions could include habitually rejecting the educational environment through actions and/or comments, temper tantrums, defiant reactions to instructions or commands, disengagement with group activities, potential for overreaction, restlessness, a continual shifting of the body, and the uttering of nonsense (Walker, 1983). It would be beneficial for those individuals involved with education to understand how best to work with this particular population (Sherrill, 1986).

## Educational Situations and Environments

Some educational situations and settings which Horvat and Kalakain (1996) feel are almost essential when working with individuals who are behaviorally disordered are: (a) the creation of a controlled environment, (b) definition of appropriate behaviors and consequences, (c) an attempt at creating an environment that is a naturalistic as possible, and (d) making instructed information situation specific. The question arises as to what form of teaching would be most effective when working with students with behavioral

disorders. Alternate forms of education often become involved. In La Crosse, Wisconsin, an organization known as The Family and Children's Center sponsors a program entitled Adolescent Leadership. Here adolescents with behavior problems are provided full-time schooling, academic instruction, counseling for the youth and families, as well as vocational training (Family and Children's Center, 1996).

Research has shown that classroom teachers, as well as physical educators, feel somewhat uncomfortable and ill-prepared in terms of working with students who have special needs (King & Dunn, 1989; Weber & Thorpe, 1989). For quite some time teachers in the field of physical education have been concerned with the way certain teaching methods affect the learning experiences of students. Many studies have compared the use of constant practice and distributed practice methods when working on certain skills (Weber & Thorpe, 1992). In constant practice, only one task is presented per session while distributed practice, or task variation, involves the injection of occasional rest periods or alternate learning experiences. Physical educators have successfully used both forms of learning with students without disabilities (Weber & Thorpe, 1992).

A study was performed comparing the effectiveness of these two teaching methods when educating adolescents with autism. Dunlap's (1984) study pitted constant task and task variation teaching forms against each other in a classroom setting. He found that when working with autistic individuals of this age group, the task variation method was significantly more effective than the constant task method for learning cognitive skills. It was then suggested by Weber and Thorpe (1992) that these findings were not "necessarily

transferable" to a physical education setting. According to Weber and Thorpe (1992) there are five individual domains of learning. Those domains are motor skills, verbal skills, intellectual skills, cognitive strategies, and attitudes. Because one method of instruction was efficient when used in one of the educational domain areas, it could not be assumed that its superiority unarguably would carry over into the other domains. In fact, Weber and Thorpe (1992) felt that each domain had an individual and separate teaching method which would be most effective.

Weber and Thorpe proceeded to perform an experiment similar to Dunlap's (1984) study, but instead of performing their study in the classroom, theirs would take place in a physical education setting. After working on gross motor skill improvement for 8 weeks with 12 adolescents afflicted with autism, Weber and Thorpe (1989) found that the task variation method was superior to the constant task method for eliciting gross motor skill improvement. Since persons who have a behavior disorder share, with autistic individuals, many traits which could be viewed as detrimental to their learning potential, it would be interesting to discover which teaching method would work best with this population. Traits that both behaviorally disordered and autistic populations possess are a short span of attention, distractibility, and somewhat of a social withdrawal (Bar-Eli, et al, 1994; Family and Children's Center, 1996; King & Dunn, 1989; Walker, 1983).

Another instructional factor that seems to assist adolescent learning potential is a low student to instructor ratio. Kamps, Walker, and Maher (1992) performed a study with nondisabled adolescents where it was discovered that small group instruction was

demonstrated to be an effective instructional format for teaching a variety of curricular tasks in several community settings. In addition to these findings Kamps et. al. (1992) found other positive effects which they deemed noteworthy. They discovered that a small group instructional setting provided increased opportunities for teacher-to-student interaction along with increased student-to-student interaction time.

Other support for the task variation instructional method comes, again, from Weber and Thorpe (1992). Through a teaching method comparison study similar to Dunlap's (1984) study and their earlier 1989 study, these two experimenters discovered that their findings carried over from individuals with autism to persons with severe physical disabilities.

Summary

Studies reported in the literature seem to suggest that the task variation teaching method appears to be superior to the commonly used constant task instructional style. This fact, along with the discoveries concerning learning group student-to-teacher ratios, becomes the basis of this particular investigation.

There was little information in the literature aimed at methods used to instruct persons with behavior disorders. Most of the literature reviewed was concerned with teaching fine or gross motor skills and/or cognitive skills. It was assumed that the subjects selected for this study should be fairly proficient at these sorts of activities, due to the fact that they possess no physical, cognitive, or neurological disabilities. For that reason, this experiment focused on the instruction of sport specific skills. Not only could results of

this study work towards the expanding of previously cited findings, it is possible that some measure of success experienced by the subjects could become a stepping stone in their advancement towards acceptable social behavior.

## CHAPTER III

## METHODS

The design for this experiment followed a pretest-midunit test-posttest configuration. All of the aforementioned tests consisted of a combination of bowling game scores and scores received on a teacher-made checklist. No control group was used. This design is efficient at observing the comparative effects of two separate treatments (Kamps, et al, 1992). To control any threats to internal validity the group instructors were alternated weekly between the constant task and task variation conditions.

### Subjects and Their Selection

The subjects for this study were 12 individuals classified, by school psychologists and La Crosse city services, as being behaviorally disordered. The subject group was made up of 10 boys and 2 girls ranging in ages from 11 to 16 years. All of the individuals displayed severe behavioral characteristics, such as inattentiveness, short spans of attention, potential for violent outbursts, and disregard for themselves and/or others (Nelson, 1996). They were all currently being educated at the Adolescent Leadership Program run by the Family and Children's Center of La Crosse.

The subjects were assigned to the CT group or the TV group after their ages and pretest scores were analyzed. The groups were arranged so that mean ages were

somewhat comparable between the two groups. Six students were assigned to each group.

## Experimental Conditions

The specific sport skill chosen to be taught for this study was that of bowling. The reasons that the skill of bowling was selected were: (a) it would be relatively easy to measure and observe skill improvement, (b) most adolescents do not regularly partake in bowling, thus any improvement made could be attributed to their training rather than outside participation, and (c) bowling is a lifetime leisure activity which may become something that these adolescents would consider for future involvement. A result of point (c) could be a decrease of "idle" time where a potential for detrimental activity may exist.

All teaching and evaluation sessions were performed at the bowling alley in Cartwright Center on the campus of the University of Wisconsin-La Crosse. This bowling facility consists of four lanes, a variety of differently weighted balls, and an adjacent game room. Teaching sessions were performed during times at which the facilities were closed to the general public. The purpose of this was to alleviate any activity which could be a distraction and thus be detrimental to this controlled study. This needed to be accounted for due to the distractibility characteristic often expressed by adolescents with behavior disorders (Horvat & Kalakian, 1996).

## Instructional Conditions

Both groups were taught bowling skills in a one instructor to six student arrangement. The instructors were female graduate students from the University of Wisconsin-La Crosse in the area of adapted physical education. Both instructors held bachelor's degrees in physical education and had experience working with adolescents with behavior disorders prior to the study. Each instructor also had demonstrated proficiency in the teaching of bowling skills by doing so to fulfill graduate program responsibilities at the university level. These qualifications, along with training in both the CT and TV methods of instruction, qualified the two women to effectively teach, observe, and assess bowling skill performance. Their group teaching assignments rotated weekly so that subject skill improvement could be attributed to teaching methods rather than the unique abilities of each instructor.

## Instructional Procedures

The instructional procedures used in this study were similar to those used with adolescents with autism by Dunlap (1984) in his teaching method comparison. Both groups received standard teaching techniques from the instructors. Those included verbal prompting, physical prompting, visual prompting, visual demonstrations, and social reinforcement.

The first test of the study was a pretest administered by the instructors. The test included bowling an actual game before any instruction had occurred. Test scores were the result of a combination of the subject's game score and scores received on a teacher-

made checklist, as observed by the experimenter. The checklist used is in Appendix A.

Though the subject groups were taught by different methods, they both were presented the same material which consisted of selected bowling skills, rules, and scoring information. The groups met two days a week for 45 minutes each session. The entire training program lasted a total of four weeks.

During the eight session training unit, concentration was placed on three basic aspects of bowling. The groups were taught a bowling method utilizing pin-aiming techniques, a four step-slide approach, and a straight delivery-release. Each of these three skills were broken down analytically into individual subskills. These subskills not only corresponded with the teacher-made checklist used for the pretest, midunit test, and posttest, they also formed the content presented to the students over the four week program. The pin-aiming technique was broken down into three subskills: starting in a steady and balanced position with the feet together, holding of the ball at chest level with both the bowling and support hands (elbows into body), and the focusing on the pins and the area of desired ball strike. The subskills associated with the four step-slide approach were the taking of four controlled steps towards the lane, the sliding of the back leg behind the support leg after the completion of the final approach step, slightly flexing the knee of the support leg, and making sure to not cross over the foul line. A straight delivery technique was divided into subskills including a smooth back swing keeping the action arm slightly bent, keeping the bowling hand in a cupped position underneath the ball (wrist flexed), exhibiting a progressive acceleration through the movement zone at the

side of the body, keeping the off hand extended to the opposite side for the purpose of balance, and using a straight follow through where the bowling arm does not drift to one side of the body or the other.

The pretest, midunit test, and posttests were composed of the actual bowling of a game along with each subject's performance of skills listed on the checklist. Day one of the program had the sole purpose of administering the pretest. On day two of the program the pin-aiming technique, body positioning, set-up, and a proper pendulum swing were introduced to the subjects. This was followed by instruction regarding the four step-slide approach and the straight delivery. Days three, four, six, and seven followed the same format with time set aside on days four and six for participation in modified bowling skill games. Day five was used for midunit testing, and day eight was used for posttesting. The program differences between the two groups involved methods used for instruction. In the case of the CT group, the full 45 minutes was spent practicing all of the skills and subskills mentioned previously. No breaks were taken by the CT group. Here the experimental task was presented repeatedly until one skill was learned, or until the class period elapsed (Dunlap, 1984). All the students were presented with the same daily learning experiences. The experimenter, and the instructors monitored the subjects to make sure that they remained on task. If a student showed signs of deviation from the task at hand the instructors used verbal cues and/or prompts to get them back on track.

During teaching sessions for the TV group practice time was interrupted every nine minutes. These "interruptions" took the form of rest periods, or alternate learning

activities (i.e., peer demonstrations, worksheet activities, and question and answer sessions). The activities focused on scoring instruction, bowling strategies, equipment information, and proper etiquette.

## Data Collection

Before the actual teaching of bowling skills commenced, the subjects were observed, by the experimenter and the instructors, as they bowled an actual game. Their game score along with their score on the teacher-made checklist (see Appendix A) resulted in their pretest score. Scoring of the teacher-made checklist went as follows: Video taping of the pretest session was performed by the experimenter. If a listed subskill was recognized as being present on 75% of attempts, the subject received a one (1) in that area. If the subskill was performed by the subject on less that 75% of attempts, the resultant score for that area was recorded as a zero (0). At the end of the observed session all the scores were added up resulting in that individual's checklist total. This total was then coupled with game scores with the end product being that subject's overall pretest score. This same process was used, during the midunit and posttest sessions, to assess whether any score improvement became evident as a result of the four week training program.

## Statistical Analysis

A parametric t-test was used to make the following comparisons: 1) the pretest scores between the groups, 2) the difference between pretest and posttest scores for each group, 3) the difference between the posttest scores between the groups, and 4) the difference between the pretest and midunit test scores of each group. An alpha level of .05 was established for the acceptance of a significant difference.

# CHAPTER IV

## RESULTS

This study compared the effectiveness of CT and TV instructional strategies when teaching the sport specific skill of bowling to adolescents with behavior disorders. The eight session unit involved a pretest, a midunit test, and a posttest.

### Subject Characteristics

Twelve adolescents, classified as having a behavioral disorder, participated in the study. Approval was granted to the experimenter by the University of Wisconsin-La Crosse (IRB acceptance), by the subjects themselves, by the parents or guardians of the subjects, and by the Family and Children's Center of La Crosse for experimental participation. The 12 subjects ranged in ages from 11 to 16 years. Nine of the subjects were Caucasian, one was African American, one was Asian American, and one was of Hispanic origin. Each subject indicated that they had only fair to limited bowling experience defined as having played less than four times in the last 2 months prior to the study. The CT group had a mean age of 13.67 $\pm$ 1.37 years with a range of 11 to 15 years. Their overall pretest mean scores were 4.33 $\pm$ 1.75 on the teacher-made checklist and 59.00 $\pm$ 23.15 on the bowling game score. This group was made up of four Caucasian males, one African American male, and one male of Asian descent.

The TV group had a mean age of 13.67 ± 1.11 years with a range of 13 to 16 years. This study group had a teacher-made checklist score of 4.67 ± 2.16 and a bowling game mean score of 66.50 ± 23.02. This second group was made up of four Caucasian males, one Caucasian female, and one female subject of Hispanic origin. Statistical analyses showed no significant differences between the pretest scores of each group. Table 1 illustrates the characteristics of each group.

Table 1. Descriptive Characteristics of the CT and TV Groups

| | ID | Age | Checklist score | Game score |
|---|---|---|---|---|
| CT group | | | | |
| | 1 | 11 | 4 | 34 |
| | 9 | 14 | 3 | 58 |
| | 12 | 13 | 2 | 70 |
| | 7 | 14 | 7 | 97 |
| | 4 | 15 | 5 | 67 |
| | 8 | 15 | 5 | 28 |
| Age range = 11 to 15 years | | | M = 4.33 | M = 59.00 |
| M = 13.67 years | | | SD = 1.75 | SD = 23.15 |
| SD = 1.37 | | | | |

| | ID | Age | Checklist score | Game score |
|---|---|---|---|---|
| TV group | | | | |
| | 5 | 16 | 2 | 40 |
| | 11 | 13 | 2 | 36 |
| | 2 | 14 | 7 | 96 |
| | 3 | 13 | 6 | 86 |
| | 6 | 13 | 6 | 82 |
| | 10 | 13 | 5 | 59 |
| Age range = 13 to 16 years | | | M = 4.67 | M = 66.50 |
| M = 13.67 years | | | SD = 2.16 | SD = 23.02 |
| SD = 1.37 | | | | |

## Pretest Results

In order for this study to be effective it was necessary to devise a method to balance out the two separate (CT and TV) subject groups. A pretest was performed on the opening day of the study with the dual role of a) helping in the structuring of equal subject groups, and b) establishing a baseline score from which any bowling skill enhancement could be monitored. The pretest involved the completion of an actual game of bowling without the help of instruction in regards to form, technique, or strategy. Individual pretest scores included game tallies along with performances on a teacher-made checklist (see Appendix A). The respective ranges in subject performances were 2 to 7 points on the checklist and 28 to 97 points on the game. Subject checklist scores had a mean of $4.50 \pm 1.88$ while subject game scores had a mean of $62.75 \pm 24.43$. Table 2 presents individual subject pretest performances. Identification (ID) numbers were assigned to ensure subject confidentiality. These ID numbers remained constant throughout the study.

The information illustrated in Table 2 was used by the experimenter, along with subject age characteristics, to develop statistically equal study groups (see Table 1). Subject gender was not taken into consideration during CT and TV group construction. When mean checklist and game scores of the two groups were analyzed statistically no significant performance differences were found. It could then be assumed that the CT and

TV subject groups would begin the study on equal ground in terms of overall bowling skills.

Table 2. Pretest Performances of the Subjects

| Subject ID | Checklist score | Game score |
|---|---|---|
| 1 | 4 | 34 |
| 2 | 7 | 96 |
| 3 | 6 | 86 |
| 4 | 5 | 67 |
| 5 | 2 | 40 |
| 6 | 6 | 82 |
| 7 | 7 | 97 |
| 8 | 5 | 28 |
| 9 | 3 | 58 |
| 10 | 5 | 59 |
| 11 | 2 | 36 |
| 12 | 2 | 70 |
| | Total = 54 | 753 |
| | M = 4.50<br>SD = 1.88 | M = 62.75<br>SD = 24.43 |

## Midunit Test Results

Using the same testing variables and methods as with the pretest, the subjects performed a midunit test to determine if any skill enhancement was becoming evident. The game score and checklist score performances for this midunit assessment can be viewed in Table 3. Paired comparison t-tests were applied to pretest and midunit test results. For the CT group ($df = 9$, $p = .05$) there was no significant improvement in game

scoring, however, there was a significant improvement at the p = .05 level in the area of checklist scores.

Table 3. Midunit Test Results

| | ID | Checklist score | Game score |
|---|---|---|---|
| CT group | 1 | 9 | 68 |
| | 9 | 6 | 66 |
| | 12 | - | - |
| | 7 | 7 | 72 |
| | 4 | 8 | 66 |
| | 8 | 6 | 46 |
| | | M = 7.20 | M = 63.60 |
| | | SD = 1.17 | SD = 9.07 |
| | ID | Checklist score | Game score |
| TV group | 5 | 3 | 58 |
| | 11 | 5 | 100 |
| | 2 | - | - |
| | 3 | 10 | 94 |
| | 6 | 11 | 105 |
| | 10 | - | - |
| | | M = 7.25 | M = 89.25 |
| | | SD = 3.34 | SD = 18.46 |

The TV group's statistical analyses ( df = 8, p = .05) showed no significant improvement at this point in the study in checklist or game score performances. Two more parametric t- tests were performed (df = 7, p = .05) with the intent of comparing CT midunit test results to TV test results. The analysis of game scores between the respective groups revealed a significant difference in performances with the TV group showing a superiority in scoring over the CT group (df = 7, p = .05). This fact implies that at this early point in

the experiment separation was already beginning to occur between the skill levels of the groups. The second between-group analysis ($df = 7$, $p = .05$) yielded no significant difference between study group checklist scores. Although neither group performed significantly better than the other on the midunit checklist test, a significant separation of skill transference was evident. The midunit game score results show the TV group as being more able to carry over their learned skills to a game situation.

## Posttest Results

On the last day of the experiment the same testing methods used for pre and midunit testing were used to perform a posttest of subject skill improvement. The posttest was used to determine if either or both of the groups had experienced significant bowling skill improvement attributable to their training, as well as to uncover whether either of the two groups had realized superior performance improvements over the other. Table 4 shows individual study group posttest results.

All t-tests for within group and between group comparisons were performed using an alpha level of .05 as the level of confidence. When CT group pre and posttest comparisons were made there was shown to be significant improvement in both checklist ($df = 10$, $t = -2.35$, $p = .05$) and game score ($df = 10$, $t = -3.21$, $p = .05$) performance. This indicated that the 4 week bowling unit did elicit skill improvement. It was reported earlier in this chapter that the CT group had demonstrated significant improvement in checklist scoring between pre and midunit testing. This fact made it necessary to perform a parametric t-test comparing CT group midunit test and posttest checklist performance.

When this was done no significant improvement was revealed. It is then shown that the CT group experienced the majority of their bowling skill enhancement early in the study.

Table 4. Posttest Results

| | ID | Checklist score | Game score |
|---|---|---|---|
| CT group | 1 | 10 | 92 |
| | 9 | 6 | 88 |
| | 12 | 7 | 83 |
| | 7 | 10 | 114 |
| | 4 | 7 | 81 |
| | 8 | 6 | 67 |
| | | M = 7.67 | M = 87.50 |
| | | SD = 2.45 | SD = 14.17 |
| | ID | Checklist score | Game score |
| TV group | 5 | 8 | 107 |
| | 11 | 9 | 92 |
| | 2 | - | - |
| | 3 | 12 | 103 |
| | 6 | 11 | 113 |
| | 10 | 10 | 96 |
| | | M = 10.00 | M = 102.20 |
| | | SD = 1.41 | SD = 7.52 |

The next statistical analyses performed compared TV group pre and posttest mean scores. The parametric t-tests illustrated significant improvement in game ($df = 10$, $t = -3.01$, $p = .05$) and checklist ($df = 10$, $t = -4.56$, $p = .05$) scoring indicated that this method of instruction was also effective at eliciting bowling skill improvement.

It has been revealed that the CT and TV teaching methods were reliable for improving the sport specific skills involved with the game of bowling. The question of which technique was most efficient at improving these skills was the next to be addressed. The first of these two analyses compared the TV and CT posttest game scores. A significant difference ($df = 9$, $t = -1.89$, $p = .05$) was shown between the mean scores of the two study groups with the TV group showing superior scores at the end of the unit. Since there was also a significant difference between TV and CT game scores at the mid-point of the study, with the TV group again enjoying superiority, it has been shown that the task variation method of teaching improved the bowling skills of the adolescents involved with the study at an earlier time and at a faster rate than did the constant task instructional strategy. This TV method superiority was also indicated through a comparison of study group mean scores received on checklist posttesting. The statistical analysis of TV and CT group posttest checklist mean scores ($df = 9$, $t = -2.20$, $p = .05$) showed that the TV group members experienced significantly greater checklist score enhancement than did the members of the CT study group.

# CHAPTER V

# DISCUSSION, CONCLUSION, AND SUMMARY

## Discussion

The results of this experiment indicated that both the TV and CT subject groups experienced significant improvement in their bowling skills due to their eight session training units. Parametric t-tests showed that there was a significant difference in the amount of improvement demonstrated by both groups. The analysis of the TV and CT posttest mean scores showed the TV group as experiencing greater improvement from the beginning of the bowling unit to the end than did the CT group.

Other data that emerges from a review of the statistical analyses include a discrepancy in the separate groups' rates of improvement at various points in the study. At the beginning of the experiment pretest results showed no significant difference between CT and TV group and checklist scores. At the midpoint of the study tests revealed no significant difference between group checklist scores but a large difference between game score results with the TV group showing superiority. This fact suggests that although the two groups seemed to be improving at equal rates, as defined by the criteria included on the teacher-made checklist, the TV group was more efficient at transferring these newly acquired skills to a game situation. Keeping a high level of concentration during game play could be a factor in this area.

Due to the fact that adolescents with behavior disorders often exhibit short spans of attention (Bar-Eli, et al, 1994) a TV teaching method where individuals have the opportunity to take frequent "breaks" seems to do a better job of keeping students focused on the task at hand, in this case the task being a game of bowling.

It should also be noted that comparisons made between posttest results of the separate groups reveal significant differences in game and checklist score respectively, with the TV group again showing superiority. This observation suggests a gradual separation between group scoring remains constant throughout the experiment. Students being more focused, willing, and ready to learn seems to be a product of the TV teaching method. This, in turn, resulted in more efficient learning by the TV group over the CT group. It becomes apparent that a CT teaching system might force adolescents with behavior disorders outside of their best learning potential forums. The theoretical basis supporting the TV method of instruction involves the belief that occasional rest periods allow for individuals to maintain a more intense level of concentration. Without the scheduled breaks students with behavior disorders may experience a waning of attention. This may result in an educational environment with a less than maximum potential for learning success.

A review of both groups' pretest, midunit test, and posttest mean scores reveals observable patterns of score improvement. The CT group experienced improvements of 4.6 and 2.9 points on their mean game and checklist scores, respectively, from pretesting to midunit testing. The TV group showed only subtle pretest to midunit checklist score

improvement (2.6 points) but improved its mean game score by a staggering 22.75 points. Table 5 illustrates each groups' pretest to midunit test improvement.

Table 5. Group Pretest to Midunit Test Improvement

| | Pretest game score | Midunit test game score | Improvement |
|---|---|---|---|
| CT group | 59.00 | 63.60 | 4.60 |
| TV group | 66.50 | 89.25 | 22.75 |
| | **Pretest checklist score** | **Midunit test checklist score** | **Improvement** |
| CT group | 4.33 | 7.20 | 2.90 |
| TV group | 4.67 | 7.25 | 2.60 |

* maximum game score = 300 *maximum checklist score = 12

These scores suggest that the TV teaching method does a better job of efficiently transferring skill improvement of adolescents with behavior disorders to actual game play situations. As mentioned earlier in this chapter, the TV strategy, where "breaks" in learning time are utilized, keeps members of this population more fresh, focused, and willing to participate in learning. The result being markedly superior level of skill improvement.

When observing improvements of the two groups between their midunit tests and posttests, the only significant improvement made was in the area of game score

performance. The CT group raised its average 23.90 points during this span while the TV group upped its average by 13.00 points. Table 6 shows individual group midunit test to posttest performance improvement.

Table 6. Group Midunit Test to Posttest Skill Improvement

| | Midunit game score | Posttest game score | Improvement |
|---|---|---|---|
| CT group | 63.60 | 87.50 | 23.90 |
| TV group | 89.25 | 102.20 | 13.00 |
| | **Midunit checklist score** | **Posttest checklist score** | **Improvement** |
| CT group | 7.20 | 7.67 | .50 |
| TV group | 7.25 | 10.00 | 2.75 |

*maximum game score = 300 *maximum checklist score = 12

The drastic rise in CT group game score average is most likely attributable to high number of repetitions by this point in the experiment. With the TV group improving its game score average by a significant amount during this time, there still remained a large discrepancy between CT and TV posttest mean scores with the TV group being superior. This suggests that the TV teaching method is not only more efficient than the CT method, it is also consistent throughout an educational unit presented to adolescents with behavior disorders.

Though this study utilized individuals who had behavior disorders rather than autism, the two conditions do share some similar traits. Bar-Eli, et al (1994) expressed that short spans of attention, distractibility, and somewhat of a societal withdrawal are traits that both individuals with behavior disorders and individuals with autism possess. The findings of Dunlap (1984), Weber and Thorpe (1992), and this study may suggest that a task variation teaching method is most applicable when working with individuals possessing the aforementioned characteristics.

## Recommendations for Further Study

Based upon the results of this study, some suggestions for further research in this area are the following:

1. Performing a similar study using children with behavioral disorders as subjects (younger than 11 years of age) rather than adolescents. If results are consistent to those found in this study, instructional techniques can be accommodated for students of this population at an earlier age.
2. Performing of separate studies, of similar format, for males and for females. This may assist in the determination of whether or not gender is a contributing factor.
3. Exercising a study for a period longer than eight learning sessions. Validity of findings may become more secure when exposed to expanded analysis.
4. Implementing an investigation with the purpose of determining the level of skill retention exhibited by the two original study groups.

5. Perform a similar study using a larger subject group in hopes of strengthening the reliability of the findings.

## Conclusions

Based upon the results of this study, the following conclusions were drawn:

Hypothesis 1, which stated. . .

Both the constant task and the task variation subject groups will exhibit significant skill improvement during their eight session training unit.

. . . is supported.

Hypothesis 2, which stated. . .

The task variation subject group would experience a significantly greater amount of skill enhancement than will the constant task group.

. . . is accepted.

## Summary

The purpose of this study was to compare specific sport skill improvement between a study group receiving constant task (CT) instruction and a group receiving instruction through task variation (TV) methods. Ten male subjects and two female subjects between the ages of 11 and 16, all classified as behaviorally disordered, were equally matched to one of the two subject groups (CT or TV). An eight session training unit, utilizing an instructor rotation system, was used to teach the subjects the following bowling skills:

1. A pin-aiming technique
2. A four step-slide approach
3. A straight arm delivery release

Each learning session involved 45 minutes of actual bowling skill instructional time. Subjects in the CT group were presented material consistently throughout the class period until time expired. Members of the TV subject group were presented the same daily material as the CT group but their learning time was interrupted every nine minutes allowing for alternate learning experiences (i.e., worksheets, peer tutoring, and instructor demonstrations). Each alternate learning experience lasted 2 to 3 minutes.

After pretesting, midunit testing, and posttesting of bowling skill improvement was completed, the results of the experiment showed:

1. The two study groups started the learning sessions at relatively equal levels of ability.
2. Significant performance improvement occurred between pretesting and posttesting for both CT and TV subject groups.
3. The TV subject group, experienced significantly more skill improvement than did the CT group.
4. The majority of skill improvement occurred in the later portions of the experiment for both groups.

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# APPENDIX A

## TEACHER - MADE CHECKLIST

# TEACHER - MADE CHECKLIST

Pin-aim

* start in steady position, feet together ____

* ball held up at chest level with both hands ____

* focus on pins and area of desired ball strike ____

Four step-slide approach

* four controlled steps toward target ____

* back leg slides behind support leg ____

* slight knee flexion in support leg ____

* no crossing over the foul line ____

Straight delivery

* smooth back swing (arm slightly bent) ____

* bowling hand kept under the ball ____

* acceleration of the arm through the movement zone ____

* off hand extended to the side for balance ____

* straight follow through ____

total ____

# APPENDIX B

# NARRATIVE STATEMENT

# (IRB)

## NARRATIVE STATEMENT

1. The purpose of this study was to determine which instructional method, constant task (CT) or task variation (TV), was more efficient at teaching sport specific skills to adolescents with behavior disorders. The experiment starting on 4/15/97, was completed by 5/8/97.

The subjects of the study were administered a bowling skills pretest. Throughout the twice a week program the individuals, broken into CT and TV groups, were expected to participate in learning activities covering three distinct bowling skill areas: pin-aiming, the four step-slide approach, and the straight release. At the conclusion of the eight session training program the subjects were administered a bowling skills posttest. The posttest scores were analyzed statistically to determine whether there was a superiority of one teaching method over the other.

2. The subjects were all members of the Adolescent Leadership Program which is directed by the Family and Children Center of La Crosse, WI. For this experiment the subject consisted of ten males and two females. The ages of the subject group ranged from 11 to 15 years with a mean age of 13 years. One of the females was Caucasian, one was of Hispanic origin. All of the males who participated in the study were Caucasian except one who was of Asian decent and one who was an African American.

Because of their age and relatively active lifestyles, the subjects were all of average to above average physical health. None of the subjects had any physical disabilities. No evidence of cognitive delay was displayed by any of the individuals involved in the study. Qualified school and city officials had classified all of the adolescents as behaviorally disordered.

Studies of this type have been performed with autistic populations (Dunlap, 1984; Weber & Thorpe, 1992). The behaviorally disordered adolescent population was used for this study the work towards an expansion of those findings.

3. Adolescents were necessary for this experiment so that the study's findings could hopefully result in the assistance of school educators in their program and/or curriculum development.

4. Voluntary, informed consent forms were administered, through the Family and Children Center, to the guardians of all of the subjects and returned to the experimenter via the same means.

5. To ensure the confidentiality of all of the subjects, their names were not included in any aspect of the study or the study's write-up.

6. The subjects, who were expected to participate in the study for a total of six learning time hours, were informed of these possible risk or inconveniences...

(a) The inconvenience of spending 45 minutes of personal time participating in the experiment, bi-weekly, for four weeks.

(b) possible hand or wrist injury caused by bowling activities.

(c) possible elbow and/or shoulder injury caused by a bowling motion

(d) possible foot, ankle, and/or knee injury caused by bowling motion

7. Procedures that were used to minimize the aforementioned possible risks were the demonstration, and instruction of proper form involved with the bowling skills of pin-aiming, using a four step-slide approach, and using a straight release technique.

8. The benefits the subjects received from the study were an increased knowledge of bowling skills, the possible discovery of a leisure activity in which they may enjoy participating in on their own time, a sense of accomplishment caused by their evident improvement, and an increased sense of self worth as a result of their program successes.

Some beneficial knowledge that occurred as a result of the study were the expanding of Dunlap's (1984), and Weber & Thorpe's (1992) findings to include other special populations besides that of autistic adolescents. Also, these findings may work towards assisting professionals, involved with the instruction of adolescents with behavior disorders, with their curriculum development and administration.

# APPENDIX C

# INFORMED CONSENT FORM

## INFORMED CONSENT FORM

Hello,

My name is Aaron Schauer and I presently am working with your child through the University of Wisconsin - La Crosse's association with the La Crosse Leadership Program. I have been working throughout the year at providing your student with a fun and informative physical education program.

As part of my studies as a graduate student at UWL I am required to perform a thesis project in my area of study. What I am planning on doing is teaching your child's class the skill of bowling using two different methods of teaching. Your child's name will never be revealed in the write-up or discussion of the research findings. In fact, their name will never be used at any time.

What I need from you is a signature on this form giving me the necessary consent to get this study started. If you have any questions at all feel free to contact me, Aaron Schauer, at 781-8943.

1. I understand that my child is at no risk when taking part in this study.
2. I understand that my child's name will never be mentioned in the write-up or discussion of this study.
3. I have been informed that the investigator will gladly answer any questions regarding the procedures of this study at any time before, during, or after the study.
4. I understand that my child has the freedom to withdraw him or herself from the study at any time.

Any concerns can be referred to myself, Aaron Schauer, at 781-8943 or Dr. Pat DiRocco at 785-8659.

_____

Experimenter

_____

Signature of student's parent/guardian

_____

Signature of student

_____

Date