1985

The Effects of Performance Standards on Behavior Patterns and Motor Skill Achievement in Children (Goals, Time-On-Task).

Rosaland Veatrice Edwards

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THE EFFECTS OF PERFORMANCE STANDARDS ON BEHAVIOR PATTERNS AND MOTOR SKILL ACHIEVEMENT IN CHILDREN

The Louisiana State University and Agricultural and Mechanical Col.

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THE EFFECTS OF PERFORMANCE STANDARDS ON BEHAVIOR PATTERNS AND MOTOR SKILL ACHIEVEMENT IN CHILDREN

A Dissertation
Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The School of Health, Physical Education, Recreation and Dance

by

Rosaland Veatrice Edwards
B. S., Mississippi University for Women, 1974
M. Ed., Livingston University, 1977
May 1985
DEDICATION

This dissertation is dedicated to Annie Corene Churchwell (1902-1979) who knew of its existence even though death kidnapped her before its beginning and to Debra Ann Tummins who has been the wind in the sails that kept my ship on course, even in stormy weather. I. O. U.!
ACKNOWLEDGEMENTS

A journey of this magnitude may begin as a solo flight but rarely, if ever, does it end as one. In my case, I have so many people to thank that I hardly know where to begin. First to the East Baton Rouge Schools and especially to the principals, physical education specialist, and 4th and 5th grade students at Brookstown and Winbourne Elementary Schools for letting me interrupt their regularly planned schedules to collect this data; to Kathy Hill who for four years has managed to give me the perfect work schedule not to mention boundless opportunity to expand my teaching repertoire; to Dr. Jerry Thomas and Dr. Dick Magill I can never say enough. They both have forced me to drink from the cup of knowledge (whether I was thirsty or not) and as a result helped developed my ability to work with scholars but not lose touch with the public school people; also to my committee members, Dr. Jack Nelson, Dr. Helen Fant and Dr. Roz Charlesworth for their individual expertise in shaping this dissertation; to my family, mother, Pete, Hilrie, Janet, Allen and Greg, who even though I am not sure they ever really understood what I was doing here, never turned me away regardless of how crazy I was; iii
to Dr. Jo Carter, without whose truck to transport my equipment none of my research would exist, much less this dissertation and also for the time she took from her already busy schedule to help me test subjects; to the future Dr.'s Madge Ashy, my traveling companion, Charlotte Humphries, Karen French and Carol Wood who not only let me bitch any time I wanted and as much as I wanted without once deserting me but also got me through more stat test and computer problems than I care to remember and to Lanie who let me practice my philosophy on her and never once doubted its validity.

A real friend is someone who has absolutely nothing to do with graduate school but sticks by you offering a never ending amount of praise and encouragement the entire time. They keep a box of kleenex just for you to dry the tears of frustration and always take your side even if there is the possibility, however slim, that you are wrong. Just when you think you can't take it another day, they offer you the opportunity for some R and R in some exotic place or the quiet solitude of a family camp. They are interested in your research and ask questions even though they still think a significant F is what you don't want on your report card. For
all that Helen Pope, and so much more, I simply say "thank You", not because I feel that it is ample but because words can never express my heart felt gratitude.

Shortly after I started to work with Dr. Amelia Lee, someone told me she would "carry buckets of water into Hell" to defend me. Looking back on it and knowing Amelia as I do, I wager had she known how many times she would have to make that journey I would not have a speciality in elementary physical education. She stood by, not always patiently, and let me learn from my mistakes. She has always known what my best was and has never settled for less (no matter how much I complained). There have been times when I thought she let me stumble and fall because of indifference, it took a long time to realize that the hardest thing a major professor has to do is let someone they care about fall flat on their face. The things she has taught me are priceless; especially how to drink champagne all night and still act like a lady and that if you wait long enough you can get almost anyone to do almost anything for you. Seriously Amelia, for the many opportunities you made available for me to succeed, learn and grow, a heart felt, "Thank You".
FORWARD

This dissertation has been written in the style adopted by the American Psychology Association for submission to scholarly journals. Pages 1-43 represent the body of the manuscript as prepared for journal submission. The remaining pages constitute the appendix, and consist of some background issues on individual performance standards and ALT-PE, an Experimental Teaching Unit (ETU), pilot data, and tables of MANOVAs, ANOVAs, and means and standard deviations.
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ABSTRACT

The effect of individual performance standards on the relationship between selected process variables and achievement for students in elementary physical education classes was investigated. The subjects were 78 fourth grade and 80 fifth grade students from eight classes in two elementary schools. Two fourth and fifth grades received standards and two fourth and fifth grades did not. A one week experimental teaching unit was used. A Solomon 4-group design was used in an effort to determine if there was a pretest effect. The data were analyzed in a Treatment (standard-no standard) x Pre (pre-no pretest) x sex (male-female) x grade (fourth-fifth) MANOVA using posttest and motor appropriate trials as the dependent measures and was followed-up by two separate ANOVAs. Correlation was used to establish the relationship between behavior patterns and performance. As expected, the treatment group was better than the control group, boys better than girls and fifth graders better than fourth. Individuals with standards performed significantly better than those with no standards. The pre x treatment interaction suggested that having a pretest tends to standardize the amount of practice an individual takes. There was a positive relationship between motor appropriate practice and performance.
regardless of treatment group. These data suggest that performance can be improved by individual performance standards and that care should be taken in using pre- and posttest methods for testing motor skill.
INTRODUCTION

Individual performance standards have been shown to improve performance in motor skills. But more importantly, what specific behaviors occur in classes with individualized standards, and how do these behaviors differ in classes without standards? The purpose of this research was to investigate the effect of performance standards on the behavior patterns and achievement of students in fourth and fifth grade physical education classes. To be consistent with previous teacher effectiveness research, a process-product design was used to probe the relationships among motor appropriate trials, age and gender, and the relationship of these variables to student performance in eight elementary physical education classes.

Considerable research exists indicating that performance can be elevated by the use of performance standards. Little doubt remains that an individual with a difficult, specific standard or goal that is attainable will have a higher level of performance than an individual with no standards or with an easy non-specific one (Claypool & Cangemi, 1983). In a review of 110 goal setting articles Locke, Saari, Shaw, and Latham (1981) found that 90% of the studies supported that hypothesis. While many goal setting studies have been undertaken,
they have rarely dealt with the topic of motor skills.

Students are regularly told to "do their best" in the academic setting, but this type of easy non-specific goal has little or no effect on motivation or performance (Rosswork, 1977). Studies designed to investigate the effects of performance standards on performance in novel tennis skills (Lee & Edwards, 1984a, 1984b), archery (Barnett & Stanicek, 1979), classroom achievement (Gaa, 1979), and math (Bryan & Locke, 1967; Latham, Steel, & Saari, 1982; Schunk, 1983) found that groups with performance standards achieved significantly higher scores than groups setting no standards or standards that were easily attainable.

Other parameters of studies involving standards are the mode (assigned or self-set), time (how much time the standard should cover, day, week, month), and the effect of standards on the performance of children. The research that does address the mode of goal setting has found that when goal difficulty is held constant, there is no difference in the performance of those groups with assigned goals and those with self-set ones (Chacko, 1982; Locke & Schweiger, 1979). In studies using children as subjects (Dickerson & Creedon, 1981; Lee & Edwards, 1984a; 1984b; Lovitt & Curtis, 1969; Rosswork, 1977; Schunk, 1983) results have been the same as with
adults. The goal should be specific and short in duration. Seemingly, the hypothesis that specific difficult standards lead to higher levels of performance than non-specific standards can be substantiated regardless of the age of the subject. While this robust finding has existed for well over two decades, little if anything has been done to address the question of "why". What happens in a learning environment to cause this better performance? Perhaps performance standards affect the time a student spends engaged in motor appropriate activity.

Time on task in the classroom is referred to as academic learning time (ALT) and is defined by Fisher, et al. (1978) as the amount of time a student spends engaged in relevant tasks with a high success rate. The surge of research regarding ALT is an outgrowth of the Beginning Teacher Evaluation Study (BTES) conducted by the Far West Laboratory for Educational Research and Development in California. The original goals of the BTES, commissioned in 1972, were to identify teacher competencies and to evaluate teacher education programs (Powell, 1980). As the study progressed, the variables of ALT, allocated time and engaged time became evident. In the end, the most promising result was a positive relationship between ALT and student achievement (Fisher, et. al., 1980).
While the BTES study was conducted using math and language arts classes, research focusing on the entire classroom process has begun to emerge in all disciplines including results from gymnasiums and playing fields in physical education.

In 1979, an instrument was developed for use in assessing academic learning time in physical education (ALT-PE) (Siedentop, Birdwell, & Metzler, 1979). Metzler (1980) is credited with the first ALT-PE study, using the instrument to describe activity in elementary, junior high and high school physical education classes. Results indicated that only 7.5% of the time allocated was spent in motor activity and that ALT-PE motor was a better indicator of students' opportunity to learn than general ALT-PE. Since that time, several studies (Birdwell, 1980; Costello & Laubach, 1978; Dugas, 1984; Godbout, Brunelle, & Tousignant, 1983; Keller, 1982; Placek et al., 1982; Rate, 1980; Shute et al., 1982; Whatley, 1980) have been conducted on ALT-PE. Results have been mixed and somewhat vague. To date the strong relationship between engagement and performance found in classroom studies has not been so well defined in the gymnasium. Engaged time in these studies range from 21% (Placek et al., 1982) to 62% (Costello & Laubach, 1978). These percentages are lower than those found in the classroom
but may only reflect the organizational differences in the two settings.

ALT-PE may be used best as a means of providing descriptive data regarding how much time is allocated for practice by the teacher and what the teacher does in the class. A more specific source of information with regard to motor activity may actually be the number of discrete practice trials. In activities where discrete trials are available (hockey, golf, free throw shooting), Siedentop, Tousignant, and Parker (1982) recommend the use of trials and consider them "highly analogous to ALT-PE" (p. 31). Physical education studies using discrete trials (Dugas, 1983; Silverman & Edwards, 1984) have found them to be a better predictor of performance than ALT-PE or other selected student variables. Gettinger and White (1979) found that the mean number of trials needed to achieve a specified criterion level of performance on school tasks (i.e., spelling, vocabulary, math computations) was more highly correlated with achievement than IQ score.

In an effort to standardize research in physical education studies involving teacher effectiveness and time on task, the physical education experimental teaching unit (ETU) was developed. Like systematic coding and student engagement, the ETU concept is also an outgrowth of the BTES study. The purpose of an ETU is to offer
instruction that is comparable across classes. It was
developed to resolve the problem of control over the
content of instruction. One major difference between
classroom ETUs and physical education ETUs is the length.
While classroom studies have varied the number of days,
physical education studies have varied the number of
minutes. ETUs have been utilized in studies by Yerg
(1977; 1981), Pieron (1981), Graham, Soares, and
Harrington (1983), Young and Metzler (1982), Keller
(1982), Silverman (1982b), and Dugas (1984). Subject
matter has included gymnastics, swimming, a novel golf
task, and archery. While the use of the ETU has stan-
dardized instruction between classes within a study, the
problem remains for replication of studies. Graham
(1979) has tried to alleviate this problem by developing
several physical education ETUs that can be used for
research.

Taken together, these studies show that while
specific standards influence the achievement level of
children in novel motor skills, the behavior patterns,
during practice, of children in classes with or without
standards are not known. In the recent search for
teacher effectiveness in physical education classes,
researchers have (a) refined the concept of ALT for
physical education, (b) identified other process vari-
ables which may be related to time utilization, and (c) adapted the ETU for use in physical education. Another step in teacher effectiveness research might be to analyze process variables in classes with different amounts of structure and relate these variables to student achievement. One example would be to study classes with and without specific standards for the students to work toward.

The purpose of this study was to investigate the relationships between selected process variables and achievement for students in elementary physical education classes; and to examine these relationships for students in classes in which the teacher assigns or does not assign individual standards. Specifically, the following research questions were asked:

1. What is the relationships between engagement variables, nonengagement variables, the number of discrete practice trials, and a final measure of skill achievement?

2. Does the relationship between the process and product variables differ for students enrolled in classes with standards and classes without standards?

3. Do students in classes with and without standards differ in the number of motor
appropriate practice trials and student achievement?

METHOD

Subjects

The subjects for this study were 78 fourth grade and 80 fifth grade students from eight intact classes in two local elementary schools. The schools were similar in size and racial balance. Two certified elementary physical education teachers participated in the study (Table 1).

Insert Table 1 about here

Task

A hockey flip shot was used as the task. The object of the task was to hit as many shots as possible through a square target. The skill was novel and somewhat like a shooting task in floor hockey, however no backswing was permitted. A plastic hockey stick was used to shoot a floor hockey ball through a target that was .31 m square and 25 cm from the floor. The shot was taken from behind a line that was located 1.86 m from the target (Figure 1).

Insert Figure 1 about here
Procedures

Specific procedures were based on the results of a pilot study. Two certified physical education teachers were asked to present lessons using two different approaches, performance standards and no standards. Each teacher taught two fifth grade classes and two fourth grade classes. For each teacher, one fourth grade and one fifth grade received standards and one fourth grade and one fifth grade did not.

Teachers were given an ETU using the novel floor hockey skill. Three days after the teacher had been given the ETU, the experimenter scheduled a training session to thoroughly familiarize the teacher with the procedures and material. Included were explicit directions for teaching the unit and demonstrating the task. The experimenter served as a student so the teacher could perform a practice lecture and demonstration. This training session took place 2 days before beginning actual collection of data in order to allow extra practice time if necessary, but not so long that the teacher forgot the procedure.

The ETU provided the teacher with an overview of the study, the objective, a description of the task, instructions on how to set individual standards for the treatment group, biomechanical analysis of the task, and
miscellaneous information. While the unit was scripted in some ways, it was not detailed to the point that what the teacher said became the treatment. An attempt was made to control for as much between-teacher variance as possible. The only difference in the unit for the control and treatment group was the assigning of standards. The two teachers were provided the same amount of time and space within which to conduct the instruction.

The selection of teachers and was made by the director of physical education for East Baton Rouge Parish Schools based on the following criteria.

Teachers:

1. Were of the same race;
2. Had approximately the same amount of formal education;
3. Had approximately the same amount of teaching experience;
4. Taught in schools that had at least two fourth grades and two fifth grades and were similar in nature (black/white ratio, location, student SES, facilities);
5. Did not have a student teacher at time of study;
6. Indicated a willingness to participate in the study.
**Instructional Sequence**

On the first day of the unit, all subjects were given instructions on how to perform the task and allowed to practice. On the second day half of the students were given a pre-test. Based on teacher judgments, 12 (4 high, 4 medium and 4 low skilled) students were selected to serve as target students in each class. In addition to skill level, the selection process was counterbalanced to include equal numbers of males and females (i.e., two high males, two high females etc.). The 12 target students were assigned to practice stations that could be clearly viewed by the camera, thus facilitating the coding from the video tapes. This process was used to alleviate the problem of how much space could be covered by the camera.

Days 3 and 4 of the study involved a review of the proper technique for the skill, assigning of standards to the treatment group, and practice sessions for all subjects. Because previous research indicated no difference between assigned standards and self-set ones when difficulty was held constant, the standards in this study were assigned by the teacher to maximize time for instruction and practice. The individual standard was actually two more trials than the average score of successful trials from the day before. This method was
used based on performance of subjects in the pilot study and was considered difficult but attainable. Each subject was allowed three, 2 minute practice sessions each day. Subjects in the treatment group were asked to record the actual number of successful trials on the card supplied. On day 5 all of the subjects were given a post-test.

**Video-Taping**

All instruction took place indoors to reduce loss of time and data due to inclement weather. Although no actual filming took place, the camera was in place two days prior to the actual study to acclimatize both the teacher and the students. Once the study began, all instruction was videotaped using an industrial type video camera (Panasonic 3990b). Four targets were arranged to be in view of the camera at all times (Figure 2). The camera was located on the stage in the same position each day.

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Insert Figure 2 about here

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**Coding of Tapes and Training of Coders**

The foundation for this study was student involvement and its relationship to performance, therefore, the accurate measurement of student engagement was crucial.
Options included interval recording, group and individual time sampling and/or second-by-second coding. Dugas (1984) compared interval coding and second-by-second coding and found no differences in the resulting information. To expedite length of coding, the interval recording method was used. Like the other options mentioned, interval recording is a technique to observe a group or an individual for a specified length of time or interval. A decision is then made to classify the behavior into a category and it is recorded. The reliability of the data is dependent on the length of the interval and should be carefully considered (Johnson & Pennypacker, 1980). If the interval is too long, the individual may produce several behaviors complicating the decision process of the coder. This study utilized a 5 sec interval with an observe-record format in that one 5 sec interval was used to observe the individual and one 5 sec interval was used for recording the observation on the code sheet. A cassette deck with an audio cuing tape was used to prompt coders as to when they should observe and when they should record. Student behaviors were categorized into the following exclusive and non-overlapping categories: 1) motor appropriate; 2) motor inappropriate; 3) on task; 4) off task; 5) interim; 6) cognitive.

Another method of gathering information regarding
the motor activity of the subject is to count the number of trials a student takes during the allotted practice time. Practice trials were categorized as motor inappropriate attempts (MIA), motor appropriate attempts (MAA), and motor appropriate successful (MAS) attempts. To code practice trials the total number of discrete trials in each category was counted for each student for the entire instructional period. The information was recorded with an event recording instrument. Once all taping was completed, the tapes were systematically coded (interval recording, actual number of practice trials) by the researcher and two trained and reliable coders. The tapes were coded for learner involvement and actual number of practice trials using instruments developed by the experimenter to meet the needs of this study. The coders were trained in a group session. Prior to the training session, all coders were given coding sheets and a list of definitions for all categories. During the training session coders viewed tapes of students actually performing the task (tapes from the pilot study were used for all training). The experimenter pointed out the different categories as they occurred. Coders were then asked to code a portion of the tape without talking to each other. Results were then compared and any discrepancies were discussed and corrected. Coders were
then asked to code another portion of tape using the same procedure. This routine was repeated until an intercoder reliability of 1.00 was met. After the coding of the tapes was completed, a reliability check was made to insure that reliability had been maintained. Twenty-one observations (11%) were selected using a random numbers program for this purpose. Reliability estimates calculated, using an intraclass ANOVA (Safrit, 1976), were .92 at the conclusion of the coding for student behavior patterns and .96 for actual number of motor appropriate and motor inappropriate trials.

Analysis

Because of suspicion that a pretest interacted with the control group in the pilot study, a Solomon 4-group design was used in an attempt to determine if there was a difference in the performance of students who received a pretest and those who did not. Engagement variables (MA, MI, C, OT, I, OF, MIA, MAA, MAS, MAT) were totaled by summing across the practice sessions for the number of intervals spent in each category. To determine if there was a difference in the performance and behavior patterns of students with individual standards and those with no standards, a Treatment (standards-no standards) x Pre (pre-test-no pre-test) x Sex (male-female) x Grade (fourth-fifth) MANOVA was performed using posttest and
MAT as the dependent variables and was followed-up by two separate ANOVAs (MAT and post-test performance were the dependent variables). Motor appropriate trials (MAT) were chosen as the dependent variable based on the recommendation by Siedentop, Tousignant, and Parker (1982). Correlation was used to establish the relationship, if any, between behavior patterns and performance scores. The individual was used as the unit of analysis (Silverman, 1982a). A significance level of .05 was established for all analysis.

RESULTS

The 2 X 2 X 2 X 2 (Treatment (trt) x Pre x Sex x Grade) MANOVA using posttest and MAT as the dependent variables revealed significant main effects for treatment, $F(2,72)=15.09$, sex, $F(2,72)=6.87$, grade, $F(2,72)=4.31$, trt x pre, $F(2,72)=11.58$, and trt x pre x grade, $F(2,72)=3.31$. The follow-up ANOVA for posttest was significant for trt, $F(1,73)=25.19$, sex, $F(1,73)=4.70$, and grade, $F(1,73)=6.71$. Subjects in the standard group ($M=15.58$) had significantly higher posttest scores than subjects in the group without standards, ($M=12.58$), males ($M=15.10$) were significantly better than the females ($M=12.72$), and fifth graders ($M=14.85$) were significantly better than fourth graders ($M=13.37$). These means and standard deviations are shown
in Table 2. The follow-up ANOVA for MAT was significant for treatment $F(1,73)=13.51$, sex, $F(1,71)=12.49$, grade,

$F(1,73)=4.47$, trt x pre, $F(1,73)=18.14$, and trt x pre x grade, $F(1,73)=6.64$. The group with standards ($M=70$) made significantly more motor appropriate attempts (MAT) than the control group ($M=54$), boys ($M=71$) made significantly more MATs than girls ($M=53$), and fifth graders ($M=67$) made significantly more MATs than fourth graders ($M=57$). These means and standard deviations are shown in Table 2.

The two-way interaction (Pretest x Treatment) is shown in Figure 3. The mean number of trials for the subjects who got a pretest was similar regardless of whether or not they were given a daily standard to work toward. The mean number of trials taken by subjects who did not take a pretest varied significantly according to whether or not daily standards were provided. The number of practice trials taken by the treatment group not
receiving a pretest ($M=84$, $SD=23$) was significantly higher than the number of trials taken by the control group with no pretest ($M=48$, $SD=20$).

The three-way interaction (Pretest x Treatment X Grade) indicates that again the range of means for subjects who received a pretest, regardless of grade or treatment group was smaller than the range of scores for the subjects who did not receive the test. These means are shown in Figure 4. The fifth graders without standards but with a pretest took significantly more practice trials than the other three groups. The means for the

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Insert Figure 4 about here

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four groups who did not take a pretest ranged from 46 to 89. For the students who did not take the pretest, the standards increased the number of trials for both the fourth ($M=78$) and fifth ($M=89$) grades. The students receiving no daily standards or pretest, both fourth ($M=52$) and fifth ($M=46$) grades, took fewer trials. In summary, standards work effectively if there is no pretest. However, giving the children a pretest causes variable results depending on grade and treatment.

The relationships between student engagement and the posttest performance were calculated for each variable
using Pearson product-moment correlation coefficients (r). In the first analysis, the correlation coefficients were calculated by treatment groups and are reported in Table 3. For the group not receiving standards (control, N=44) a significant relationship was found for the post-

test and motor appropriate (r=.51), non-motor time (r=-.36), motor inappropriate attempts (r=-.30), and motor appropriate attempts (r=.46). For the group receiving standards (treatment, N=45) a significant relationship was revealed for the posttest and MI (r=-.44), and MIA (r=.36). More variance in the posttest scores of the control group was accounted for by MA, NMT, and MAT than the treatment group. The equality of the r's were tested using Fisher's Z transformation (Kleinbaum & Kupper, 1978). Those coefficients not significantly different from each other (MA, MI, MIA, MAT) were collapsed for further analysis (N=89) and are reported in Table 3. The Pearson r for posttest and MA r=.44, MI, r=-.30, MIA, r=-.35, MAT, r=.38. Disregarding group membership, the data revealed significant relationships between all process variables and the product score. The correlations ranged from -.30 (MIA) to .44
(MA). The largest amount of variance in the posttest score was accounted for by MA ($R^2=19.33$) indicating that the more time spent in motor appropriate behavior the higher posttest score and, as expected, the more time spent in motor inappropriate behavior the lower the posttest score.

**Discussion**

The present data are congruent with the theory that performance standards help individuals to achieve significantly higher performance scores than those receiving no standards or easily attainable ones (Barnett & Stanicek, 1979; Gaa, 1979; Latham, Steel, & Saari, 1982; Lee & Edwards, 1984a; 1984b; Rosswork, 1977; Schunk, 1983). The fourth and fifth grade students in standard-oriented classes performed significantly better on a novel floor hockey skill than students in classes who were simply told to do their best. The performance standards used were assigned each day to each individual based on his or her prior achievement. Each child was given a clear concept of what his/her task was and a means to measure their accomplishments. While the standards were difficult, they were consistent and attainable.

The effects of standards on performance have been studied in a variety of settings, yet no one has attempted to explain the process involved. In this study
the group receiving standards took significantly more motor appropriate trials (MAT) than the group receiving no standards. All subjects were allotted the same amount of practice time each day (three, 2 minute sessions) regardless of treatment group. These data suggest the individuals receiving performance standards made better use of their time than those individuals who did not have standards. It seems logical to hypothesize that individual performance standards gave subjects a more precise idea of what they were doing and therefore enabled them to use their practice time more efficiently.

Even though there was no main effect for pretest, the pretest did interact with the treatment groups and grade. The means of unpretested groups were further separated than pretested groups. Having an adult giving a test, appears to set the pace or perhaps tends to standardize the number of practice trials taken during the allotted practice sessions. This may take away some of the incentive provided by the individual performance standard. Those students who did not take a pretest performed differently according to whether or not a standard was set for them. With a pretest to pace practice or a standard to work toward, the number of practice trials was reduced. The same applied for subjects in the fourth and fifth grades with one
exception. Even though the fifth grade subjects receiving a pretest could have used that score as a standard, they apparently did not but used the individual set for them. This may reflect an increased cognitive processing ability in fifth graders as compared to fourth graders. Pre- and posttest are commonly used in physical education classes with the gain score being used as the product measure. These data suggest that care should be taken when considering this form of measure, especially if the testing situation is the same or similar in nature to the practice session. The pretest may actually standardize the rate of practice and reduce the benefits of future practice.

The basis for the ALT-PE theory rests on the relationship between variables. The variables used in this study were student engagement (MA, MI, NMT, MIA, MAT) and the posttest score. When the correlations for this study were calculated by treatment groups, a slightly stronger relationship between process and product existed for those not receiving performance standards. This was somewhat alarming and more than a bit confusing when one considers that the treatment group had a significantly higher mean posttest score and MAT than the control group. Each day during the practice sessions, the treatment group was given a standard by which to judge
their performance, something to work towards. The control was simply told to practice. On the posttest all subjects, regardless of group were told to hit as many as they could into the target during the allocated number of trials, but were not given specific scores which they should try to attain. The posttest situation was more similar to the control group's practice sessions, a probable explanation for the higher $r$ for the control group. In addition, the interaction of the pre-test with the treatment contributes to this confusion. Even though the $r$'s are different, statistical analysis revealed they were not significantly different with the exception of non-motor time (NMT). NMT is the variable created to represent all time spent engaged in any activity that was not motor. Anything other than actual motor involvement would be expected to be negatively correlated with a performance score. This logical statement is true for the control group ($r=-.36, p.<.05$) but not for the treatment group ($r=.08, p.<.59$). One component of NMT was interim time, which by definition was any time spent changing positions, writing down scores or repairing the equipment. The control group had no scores to record and had no activity falling into that category that could have improved performance. However, it seems that the time the treatment group spent record-
ing their scores could possibly have reinforced their perception of their task. In turn, they were better able to use that time made available to them for motor practice. Since remaining r's are not significantly different they will be discussed for the overall group.

Previous studies have failed to consistently show the anticipated relationship between ALT-PE and the product score. Dugas (1984) reported a r of .00 between the skill posttest in archery and total intervals of ALT-PE when the individual was used as the unit of analysis. Youn and Metzler (1982) found the relationship between ALT-PE and achievement to be negative (r=-.25). The coefficients in this study ranged from -.30 to .44, p. < .05, and accounted for 9 to 19.36% of the variance in the posttest score. The relationship between the posttest and motor inappropriate time (MI) was negative supporting the notion that practice alone is not sufficient for improvement of motor skill, the practice must be at a successful level (Fisher et al., 1978; Siedentop, Birdwell, & Metzler, 1979).

Furthermore, the relationship between motor appropriate time (MA) and motor appropriate trials (MAT) lend support to the theory that as motor appropriate behavior increases, performance increases. The relationships found in this study are stronger than those mentioned in previous
research and may reflect the structure of the ETU. While it was the intent of the researcher to reduce between-class variance with the ETU, it was not intended to become a treatment. Unlike many physical education classes, these were highly structured and no transition of students from place to place occurred other than to change positions at their targets. In addition, most of the previous research has used a residual gain score as the product measure. Because of the design in this study that was not possible. The dependent variable used may account for some of the differences found. Finally, the system used to assess behavior made no attempt to establish what, if anything, the subject was doing in the form of mental practice.

The results of this study suggest that performance of motor skill can be improved through the use of individual standards and that motor appropriate practice can be increased. The relationship between the two variables, in terms of a Pearson product-moment correlation, is not as strong as expected and should be interpreted cautiously. Further findings indicate that methods used for testing in physical education (pre- and posttest) may have more effect on performance than might be expected. It appears that not only should the problems associated with gain scores be considered but
also the stabilizing effect the pretest apparently has on the individual's effort.
References


Gettinger, M., & White, M. A. (1979). Which is the stronger correlate of school learning? *Time to
learn or measured intelligence? *Journal of Educational Psychology, 4*, 405-412.


Pieron, M. (1981). Research on teacher change: Effectiveness of teaching a psychomotor task study


Shute, S., Dodds, P., Placek, J., Rife, F., &


Figure Captions

1. Target diagram and dimensions.
2. Alignment of camera and targets for video taping.
3. Pre x Treatment interaction with MAT as the dependent variable.
4. Pre x Trt x Grade interaction with MAT as the dependent variable.
TARGET DIAGRAM
CAMERA ALIGNMENT

CAMERA

1

5

6

7

8

3

4

2
0 = CONTROL

0 = TREATMENT
O = Treatment (fourth)
● = Treatment (fifth)
V = Control (fourth)
▼ = Control (fifth)
List of Tables

1. Descriptive data for teachers
2. MEANS and Standard Deviations for Posttest and MAT
3. Correlation Coefficients
Table 1

Descriptive data for teachers

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All Subjects

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* significant at the .05 level
APPENDICIES
Appendix A
MANOVA and ANOVA Tables and Intercoder Reliability
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MANOVA TABLE FOR MAT AND POSTTEST

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* Significant at the .05 level
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* significant at the .05 level
** significant in follow-up ANOVA but not in MANOVA
### ANOVA TABLE FOR MAT

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* significant at the .05 level

** significant at .05 level in follow-up Anova but not in MANOVA
Appendix B

Issues in performance Standards and ALT-PE
ISSUES IN PERFORMANCE STANDARDS AND ALT-PE

The concept of goal setting falls within the broad domain of motivational theory and is similar in meaning to behavioral objectives, competencies, and standards of achievement. Research has demonstrated that more effective learning occurs if children are motivated to practice a task and often have experimented with motivational techniques falling within the performance standards framework. While research has shown that "goals" or "standards" can regulate human behavior by increasing attention, effort and persistence, there are numerous factors which influence the effectiveness of goals on improving task performance.

Research in the tract of goal setting and the effect it has had on student performance has been extensively covered during the last 20 years. Perhaps the most robust finding in any area of research is that a sufficiently motivated student with a difficult, specific goal will have a significantly higher level of performance than a subject with an easy non-specific goal (Claypool & Cangemi, 1983). The evidence is consistent in indicating that specific goals lead to greater performance than vague, general goals such as "do your best" or "I want you to do as well as you can"
(Rosswork, 1977). In fact, a number of studies indicated that subjects with no goals perform as well as the subjects with an easy or non-specific goal such as those mentioned (Barnett & Stanicek, 1979; Bryan & Locke, 1967; Gaa, 1979; Latham, Steele, & Saari, 1982; Lee & Edwards, 1984a, 1984b; Schunk, 1983).

While only a few researchers have studied the effects of goal clarity or specificity on performance, results do support clearly stated behavioral objectives that are measurable (Claypool & Cangemi, 1983; Motowidlo, Loehr, & Dunnette, 1978). Even if the learner is motivated to learn a task, it is important to give the learner a clear idea of the task to be performed and the standards of achievement.

Another aspect to consider is the goal difficulty as well as the task difficulty. Most studies have shown that hard or challenging goals facilitate performance to greater extent than easy goals. In an extensive review of goal-setting research, Locke, Mento, and Katcher (1978) found evidence for a positive, linear relationship between goal difficulty and task performance. However, one must not ignore the individuals' ability to approach their goals. While goal theory predicts that more difficult goals lead to better performance, the subjects expectancy is also
correlated with performance. With a complex task, even a difficult goal and exerting more effort may not improve performance. The child must have some chance for success, and more importantly, they must perceive that capacity to succeed. A limited amount of information is available on the topic of unattainable goals. The question has not been resolved whether or not there is a positive linear relationship between goal difficulty and performance or if indeed a goal that is too difficult actually causes a decrement in performance. A recent study (Humphries, 1983) investigating this question found a trend in this direction but did not obtain a significant level of acceptance. However the research did produce one finding that could possibly be of more importance. As the goal difficulty increased, the quality of the performance decreased and the numbers of errors increased.

A third component in goal setting is the range of the goal. Research shows that a wider range of goal difficulty is more likely to affect performance (Schunk, 1983). For example, Bandura and Simon (1977) found that setting weekly goals for weight loss only led to weight loss when daily goals were set as well. The time span is especially important
for children.

One parameter of goal setting that is not as well defined as the other is the issue of self-set goals as opposed to assigned ones, especially with children. Most of the research has used assigned goals but recent investigations have been expanded to include the self-selection of performance standards. It appears that when goal difficulty is held constant, there is little or no difference in self set and assigned groups (Chacko, 1982; Locke & Schweiger, 1979). Several studies have shown that personal goals are more effective in maintaining and improving performance. These findings have not been consistent for both cognitive and motor tasks. Two studies (Dickerson & Creedon, 1981; Lovitt & Curtis, 1969) indicated that for cognitive tasks, pupil selected standards are more effective than teacher imposed ones. These studies are also significant for the fact that both used children as subjects. In an effort to replicate these findings, two more recent studies (Lee & Edwards, 1984a, 1984b) using motor skills have been conducted. Results indicated that all groups improved from pre- to posttest on a complex motor skill (tennis forehand) regardless of the goal. When using novel motor skills for the task (bouncing a tennis ball up or down using a tennis
racket) goals were found to make a significant difference. The group receiving teacher assigned goals performed better than the group setting their own goals who performed better than the group told to "do their best". More specifically, the results indicated that goals set by the teacher or student could be effective in producing a higher level of performance on novel motor skills but in contrast to the cognitive literature, teacher set standards were more effective than student set.

The authors offered two points of interest in an effort to give more insight into their research. First, the students had no training or instruction in goal setting. As a result, the students did not set consistent goals nor did they set goals that would be considered difficult or challenging based on prior performance. Secondly, the teacher in the study used a command style instruction with a military type control over his classes indicating that the students were more responsive to his desires or goals than to their own.

In order to examine these issues more carefully, a second study was conducted using the same groups (control i.e., "do your best", teacher-set and student-set goals) and adding a fourth group.
The fourth group was actually a yoked group to the student-set group. This enabled the researcher to view the effect of goals set by a student but assigned by the teacher. Once again the results indicated that any goal is better than no goal, but, contrary to prior motor skill research, the student set-standards were more effective than teacher assigned ones. Thus, the second study found support for the view that goals are effective enhancers of performance and that, in fact, children can set effective goals for themselves.

Goal setting is a mechanism which can elevate performance but several factors must be considered if goals are to be used effectively. Research suggests that knowledge of results in relation to a goal is necessary if the goal is to work. In many situations in physical education the feedback is immediate and automatic. For example, the subject knew immediately if they attained their goals when doing ups and downs with the tennis ball but on the forehand drive someone had to tell them if the ball landed in the target area. Incorrect knowledge of results or lack of knowledge of results could have been a determining factor in the performance of this skill.

The last factor that is considered necessary for
an effective goal program is consideration of individual differences. When demographic variables have been included in studies, only race has been found to be relevant. Goals seem to be more effective for blacks than for whites. Neither educational level nor age has had any effect as a moderator of goal setting nor is there any reason there should be (Latham, Steele, & Saari, 1982). In conclusion, goals are effective in improving the performance of learners. Implementation of a goal centered program is simple and relatively non-time consuming but the following guidelines must be followed if the program is to be successful:

1. Consider student input into goal planning and setting.
2. Set specific goals that are difficult yet attainable.
3. With a longer time span, set a sequence of goals that are hierarchical in nature.
4. Provide feedback in relation to the goal that is immediate and correct.
5. Individualize goals.

The need to verify that learning is taking place in physical education has led educators to the reality that it is no easy task. Options seem to be a
product score (i.e. posttest) or the process. The product score can tell who runs faster, jumps higher and throws further but when one considers how slowly these skills develop and how long it takes to note a change one could argue their usefulness as verification of learning. Secondly, many motor skills are difficult to measure reliably, and measurement can be time consuming making it impractical for the classroom teacher. The alternative measurement, the process, is commonly referred to in physical education as Academic Learning Time-Physical Education (ALT-PE). It is a measurement of time that a student is engaged in motor activity at a high level of success (Siedentop, Birdwell, & Metzler, 1979). It is not sufficient that the child be actively engaged in physical activity, that involvement must be at a level where few if any mistakes occur. A match must be made between student ability and task difficulty before one can consider student behavior as ALT-PE (Siedentop, 1983). Individually set standards can assist teachers in matching instruction to the skill level of each student. Motor development specialists have noted the differences which are evident in a child's ability to learn and perform movement skills (Corbin, 1980; Thomas, 1984; Zaichkowsky, Zaichkowsky
& Martinek, 1980). With the variations in movement learning tendencies and traits within age group, subject matter should logically be arranged into multiple standards.

Research has shown that many physical education classes produce very low rates of ALT-PE (Metzler, 1980). While large amounts of time may be allocated for instruction and practice the bulk of time is used for management, waiting and transition. Even when the children are engaged in motor activity, the level is often at such a low success rate that no gains are evident. Berliner (1979) suggest that engaged time spent at a high error rate is unrelated or possibly negatively related to achievement. It appears that the key to achievement in physical education is active student involvement at an appropriate level (i.e. low error rate) and individually set standards appear to be one approach to achieving this goal.

The measurement of process variables has been the topic of research for the last decade (Mark & Metzler, 1983) but is far from being refined. Categories in the ALT-PE instrument developed at Ohio State University (Siedentop, Tousignant, & Parker, 1982) are non-specific and made to fit a wide variety of motor skills. The Beginning Teachers Evaluation
Study (BTES) from which ALT-PE was derived is very specific with reference to math and reading skills (Berliner, 1979). A major step in teacher effectiveness research in physical education will be taken when researchers develop (or at least attempt) content-specific categories for all physical education activities. Metzler (1983) goes a bit further and states that it must be skill-specific as well. For example, if the goal of the lesson in basketball is to improve the lay-up shot, motor appropriate trials in a passing skill would have no effect. In the search for refinement of the instrument one does not want to become trapped in a maze of task specificity that precludes ecological validity and makes its use impossible in the real world (Anderson, 1983). Because of different interest and analysis of information, it may be found that two instruments may be of use, one for the experimental researcher and one for the teacher educator.

As an alternative to ALT-PE, it has been suggested that criterion trials or discrete trials be used as the process variable in research on teaching (Pieron, 1981; Siedentop, Tousignant & Parker, 1982) Discrete trials give a more direct measure of the skill and should be a better predictor than ALT-PE,
at least until ALT-PE has undergone some refinement. One last consideration is that ALT-PE supplies adequate information regarding the quantity of the time spent in activity but has little information regarding the quality (Parker & Sullivan, 1983). This becomes a problem if, as theorized by Griffy (1983), there is not necessarily a linear relationship between ALT-PE and performance and that too much time on task may actually be detrimental. If one explores not only how much time is spent engaged in motor activity as well as the quality of that time, the need for a discrete variable becomes even more evident. Whether time (ALT-PE) or trials are studied, individually set standards can place students at a level of practice which is more likely to ensure success.
Additional References


Appendix C

Pilot Study
PILOT STUDY

The method for the pilot study is identical to the methods section provided in the proposal with the following changes:

1. The subjects were 24 fourth and fifth graders (12 each) enrolled in a local elementary school. They were randomly selected from two intact classes. Only 18 of the subjects were used in the final analysis because of missing data;

2. The experimenter served as the teacher;

3. Subjects were given three sets of 20 trials each on the pre and post-test;

4. Subjects were given 3 days of instruction between the pre and post-test;

5. No measure of motivation or self-concept was used;

Analysis

Three measures were calculated for use as dependent measures in the analysis. The first is the residual gain score. All pre and post-test scores were placed in a regression and residuals were generated. This was done to adjust for different levels of initial skill. The second variable is called motorE and is representative of total time
spent in motor involvement. The third is totalE and refers to motorE plus ontask.

The data were analyzed in a 2 x 2 (Group x Sex) MANOVA. The results yield main effects for group $F(2,13) = 7.21, p < .01$ and group by sex interaction $F(2,13) = 5.71, p < .02$. The follow-up ANOVA with totalE as the dependent measure demonstrated significant differences for group by sex interaction $F(2,13)= 11.84, p < .01$ and just missing significance for group $F(2,13)=4.30, p < .057$. The ANOVA for residual was significant for group $F=10.20, p < .01$. The group not receiving standards ($M=2.62$) was significantly better than the group for which standards were set ($M=1.01$). A complete list of means is located in Table 1.

Discussion

The results indicate that the group receiving no standards performed significantly better than the group receiving performance standards. This can probably be accounted for by the fact that age is confounded within group. Subjects in the fourth grade ($M=9$ years, 5 months) received standards while
subjects in the fifth grade (M=10 years, 6 months) did not. It is possible that age accounted for so much of the variance that the standards could not make a difference. Another point is the observable competition in the 5th grade group. Even though no mention of standards was made and it was not suggested that they count how many shots they made, they did so. Personal tallies were made at the end of each trial, each day, and total. The individual's standard became the total number of successful trials of their group members. To complicate matters even more, the physical education teacher at the school discussed individual goal setting with her class at the first of the year.

The mean of totalE reflected the amount of time a subject spent motor engaged (both appropriate and inappropriate) in addition to the time they spent on task as a retriever. The group with the highest mean totalE (M=.86) had the lowest residual gain score (M=.85). This indicated a negative relationship between performance and time on task in anything but motor skill. The group represents the females who received the standards. This may indicate that while the standard kept them on task, it did not affect their motor skill performance.
Even with all the problems associated with this pilot, those mentioned earlier regarding goal groups, in addition to the small sample size, the fact that the teacher/experimenter was unfamiliar with the students and using an unrefined coding instrument, the study does have merit. It provided the experimenter the opportunity to determine the most efficient alignment of the targets for video taping, length of ETU, and testing procedures.
Table I

Residual

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</tr>
<tr>
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<td>.86</td>
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<td>.67</td>
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</tr>
<tr>
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<td>.26</td>
<td>.85</td>
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</tbody>
</table>


Appendix D

Physical Education Experimental Teaching Unit
PHYSICAL EDUCATION EXPERIMENTAL TEACHING UNIT (ETU)

Overview

I am in the process of studying the effects of achievement standards on motor engaged time and their effects on performance on a simple motor skill as part of my graduate studies. Essentially, I am attempting to determine if and how time on task can be increased, and thereby, improve performance. I want to thank you and your students for helping me with this research project.

Briefly, I am asking you to teach two 20 minute lessons to four (two 4th and two 5th grades) of your regularly scheduled classes. The topic of your lessons is explained in detail below. The students will be given one day of practice on the task and then tested. After the 2 days of instruction the students will be tested again to see how much if any they improved. The only difference in the instruction for the four classes will be that two class will be given an achievement standard and two will not.

I will provide details about the task as well as how to set standards. In addition, I will give you a script that should be followed as closely as possible to insure that all students in the study receive the same instruction.
OBJECTIVES

The objective of your 2 days of instruction will be to follow the directions as closely as possible so that all students within each group receive the same information.

DESCRIPTION OF THE TASK

The task is novel. It is somewhat like a shooting task in floor hockey, but no back swing is permitted. A plastic hockey stick is used to shoot a floor hockey ball through a target that is 30.48 cm square, 25.40 cm from the floor and 1.8 m from the shooting line. The object is to make the ball go through the target in one swing. The best score is the highest score of 15 attempts. Thus, a perfect score is 15.

BIOMECHANICAL ANALYSIS OF TASK

In an attempt to eliminate any difference between teachers, the following task analysis is offered to enable you to better understand the mechanical principles involved in the task.

GRIP

The following principles are related to appropriately gripping the stick:

1. The stick is held in front of the body.
2. In order to maintain maximum control, both hands should be placed on the stick.
(They must be placed above the tape mark on the stick.)

3. The hands should be in contact with each other.

4. The dominant hand (right for right handed person) is on the bottom to provide for better overall power and control.

STANCE

The following principles are related to an appropriate stance:

1. To provide a solid base of support, which results in better balance, the feet should be spread approximately shoulder width apart.

2. The knees should be slightly bent and remain so through the swing.

3. The feet should be placed at a 45 degree angle with the target.

4. The bottom of the blade on the hockey stick should be placed at a 45 degree angle with the floor.

5. The ball should be in front of the forward foot.

GETTING THE BALL INTO THE AIR

The ball is actually "flipped" into the target and
must be lifted into the air. In order to accomplish this goal, several principles are important to consider:

1. The blade of the hockey stick should be placed directly behind the ball, so that when held at the appropriate angle, it is actually under the ball. This should pick the ball up.

2. Contact with the ball should be made at the mid-point of the blade between its heel and toe.

3. There should be no backswing.

**HITTING FOR ACCURACY**

Once the student can get the ball into the air, he or she must concentrate on accuracy. In order to obtain maximum accuracy, concentrate on the following points:

1. Place the blade so that it faces the target.

2. Contact the ball with the blade at right angles "square" to the target.

3. Point the blade toward the target on the follow through.

**EXPERIMENTAL TEACHING UNIT (ETU) GUIDELINES**

This section provides the information needed for
the days you are actually involved in teaching the unit. It is divided into the following sub-sections: preparing for the ETU, testing, script for teaching, and miscellaneous information that may be helpful.

PREPARING FOR THE ETU

Essentially, your major responsibility will be to teach the classes using the script and information provided in this booklet. Therefore it is important that you become familiar, not only with the script, but also with the do's and don't's located in the miscellaneous information.

TESTING

PRE-TEST

As mentioned earlier, after one day of practice on the task all students will be given a pre-test. Each student will be given three sets of 15 trials and the score will be the average of the three sets. You will be provided assistance to insure the accuracy of the scores.

POST-TEST

After you have finished the ETU the students will be tested again. Just as before, you will be provided assistance to insure the accuracy of scores. During the pre- and post-test sessions, no mention will be made of standards. All students will be told that they
will be given three sets of 15 trials, and that their score will be the average of the three sets.

SCRIPT FOR (ETU)

Day 1

We are going to be working on some skills that can be used in a game of floor hockey. Floor hockey is related to ice hockey and field hockey. Both ice hockey and field hockey are played in the Olympics with ice hockey being played in the winter and field hockey being played in the summer. Another interesting point is that mostly males play ice hockey and mostly females play field hockey, while both males and females play floor hockey.

The purpose of floor hockey is to score goals. You need a plastic floor hockey stick, a ball and a net to be able to play the game. The first thing I want to emphasize is safety. Because we will be swinging hockey sticks, it would be very easy for someone to be injured, so always remember the following points:

1. Be sure there is at least a stick length between you and the next closest person;
2. Do not walk up behind or in front of someone in the process of shooting;
3. Do not swing your stick above your waist even when following through after a shot;
As I mentioned earlier, the purpose of hockey is to score goals, so it is very important that you are able to shoot the ball into the goal. It is also important to be able to pass the ball to someone else, so that if you cannot get a shot off, someone else could. The skill that we are going to work on can be called a flip pass or a flip shot.

The first thing you need to be able to do is hold the stick properly. Notice that all of the sticks have a piece of tape on the handle. Do not put your hands below that piece of tape.

1. Put the handle of the stick in front of your body.
2. If you are right handed, put your right hand on bottom, and if you are left handed, put your left hand on bottom. If you are right handed, your left side is closest to the target, and if you are left handed, your right side is closest to the target.
3. Your other hand is placed above the bottom hand, but close enough that they can touch.
4. Your feet should be about shoulder width apart for good balance and at about a 45 degree angle to the target. Notice that I
am not facing the target and I do not have my side to the target.

In using the flip pass or flip shot, you do not use any backswing; you place the blade (show them what the blade is) behind the ball and push the ball to the target. (You will be demonstrating the entire time you are giving the instructions.)

1. Place the blade directly behind the ball so that it is parallel to the target.
2. Angle the face of the blade at a 45 degree angle. This will help to lift the ball into the air.
3. On the follow through the blade of the stick should point toward the target.
4. You must stand behind the line and place the ball behind the line when preparing to take a shot. The objective of the task is to hit as many shots as possible through the target during the practice trials. Any questions?

Three people will be assigned to each target, one person will shoot and the other two will retrieve the ball for the shooter. When you are a retriever, your job is extremely important because you actually deter-
mine how much practice the shooter gets. If they do not have the ball, they cannot shoot. As I mentioned earlier, there will be two retrievers at each goal, one on the right side of the goal and one approximately two feet behind the goal. The person on the side of the goal is responsible for getting the ball if it hits the target or does not go through the hole and placing the ball back in the shooting area. If you are the retriever behind the target, you are responsible for any balls that go into the hole, balls that go over, and balls that go around the goal. In other words, you are responsible for any and all balls that get past the front of the target. Both retrievers should follow these rules:

1. No sitting or laying down on the job.

2. When you go after the ball, go and come as quickly as possible.

3. Place the ball behind the shooting line and be sure it is not rolling when you let it go.

4. Do not throw the ball, take the ball to the shooting line yourself.

5. Move away from the shooter as soon as you have put the ball in place.

6. Do not lean on the goals.
7. If the target is not straight and in place, fix it.

Remember, if you are a good retriever for someone, they are more likely to be a good retriever for you. I will tell you when to rotate so that everyone will have the same amount of time at each job. When I say stop, the shooter should put the stick on the floor and the next shooter should pick it up and begin when I say. Any questions?

Explain to the students that there is a card on the target with each of their names and which position they will have first (shooter, back retriever, side retriever). Send the students to targets according to the list provided by the experimenter. Once everyone is in position, you can begin practice. When they rotate the first time, the side retriever becomes the shooter, after that they will rotate properly.

Day 2

As students enter the gym, send them to the same targets they had practiced on the previous day. To begin the 2nd day, students will be reminded how to hold the stick (page 7) and where to place the stick in relation to the ball (page 7). You will also remind the student that the purpose of the task is to get as many shots through the target as possible for each set
of trials. Remind them of the importance of being a good retriever, and correct any problems you might have encountered on day 1.

Assistance will be provided by the researcher to help pre-test all students on the second day. Each student will be given three sets of 15 trials each, one point will be scored for each time the ball goes through the target. The pre-test score will be the average of the three sets. Before the testing begins the following instructions will be given to the class.

"These are LSU students and they have come to help us with our class today. One will be at each target to help your group. Instead of me telling you when to rotate today, your helper will tell you".

Day 3

After the students get into the gym, assign them to the targets according to the list that I have given you. It is important that the students go to the assigned target and remain at that station throughout the class. They will also practice at the same target for the remainder of the unit. Once the students are at the stations, the following instructions should be given.

1. Review how to hold the stick (see page 7).
2. Review where to place the blade in relation to the ball (see page 7).

3. For the control group (the group not getting the standards) that is all the formal instruction they will get. You will need to explain to them how they will practice. Attached to their target they will find a schedule of who shoots first, who shoots second and who shoots third. Tell them that while they are not shooting, it will be their responsibility to retrieve the ball for the shooter. When the whistle blows, it will be time to change positions. The shooter should lay the stick on the shooting line and the new shooter should not pick it up until you give the signal to begin. During the class you will move through out the teaching area and correct improper technique (i.e., stance, grip, etc.) and give non-specific feedback like do your best or good job.

4. For the treatment group (the classes getting the standards) you will explain that there is a card at each target with
the names of the students in their group on it. The card will indicate the order of shooting but will also have a standard listed for each student. The standard will be listed after his or her name. Explain to the students that each day they will have a standard, and that they are trying to get at least that many each time they shoot. In order to know if they reach their standard, they must keep count of how many shots they make during each shooting period. Each time they finish shooting, they should write their score on the sheet by their name. Explain that each person is responsible for keeping his or her own score and writing it down. Make sure they understand that they record their exact score for that turn and not their standard. For example: "Johnny's standard for today is 10, so he is trying to get at least 10. If he gets 4, he writes 4 by his name for his score. If he gets 12 he writes 12 on his card. He writes how many he actually gets during his turn." During class you will move throughout the teaching area correcting technique as with the
other group and also making sure they know what their standard is and trying to make sure they are writing down an accurate score. I know this is not possible as you can not stand there and count for each child, but spot checking will help.

Day 4

Same as Day 3

Day 5

The post-test will be given today. Students will be tested at the targets on which they have been practicing. Each student will be given 3 sets of 15 trials. A score will be recorded for each set. No mention will be made of standards. Each student, regardless of group will be told: "You will be given 3 sets of 15 trials to hit the ball into the target. Do your best and try to hit as many as possible into the target".

MISCELLANEOUS INFORMATION

You are one of two teachers who are involved in this study. The video-tapes made of these lessons will be viewed by several researchers in the next few weeks. In attempting to preserve confidentiality, teachers, schools, and children will be assigned a number and referred to in this manner. In no instance will a
teacher, school or child be identified by name.

One very important aspect of this study is that two of your classes will be involved in standard of achievement and the other two classes will not. It is vital that the classes not receiving standards not be exposed to standards during the study. By following the suggested teaching script, I feel that you will be able to avoid this. Once again, the purpose of the script is not only to standardize the instructions you give your students, but to help make sure that the students at other schools receive the same instructions throughout the unit.

Finally, I realize that this is an inconvenience of sorts for you and your students, and I do want to thank you for taking time from your already planned curriculum to help me with this study. I hope that in return I have planned a unit that you will enjoy and that will give your students an opportunity that they might not have had otherwise. Please know that I do appreciate your help and cooperation and thank you again for your much needed assistance.
Appendix E

Card for Recording Daily Practice Session Scores
<table>
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Appendix F

Code for Interval Coding

88
INTERVAL CODE SHEET

CATEGORIES
MA
MI
OT
C
I
OF
Appendix G
Definitions for Coding Student Engagement
DEFINITIONS FOR CODING STUDENT ENGAGEMENT

Motor Appropriate (MA)-MA can only be coded if a subject in the position of shooter. In order to be motor appropriate, the following criteria must be met.

1. The ball must travel in the air (cannot roll) to the target.
2. The ball must be on or behind the shooting line.
3. The ball must contact some part of the target face or pass through the hole.
4. The ball must be still at time of shot.
5. The subject must stand behind the shooting line.
6. The subject's feet should not move during the shot or on the follow through.

Motor Inappropriate (MI)-MI can only be coded if a subject is in the position of shooter. A motor inappropriate response is one in which:

1. The ball bounces before it reaches the target;
2. The ball goes over or to the side of the target;
3. The ball does not leave the floor, rolls to the target;
4. The subject shoots the ball from in front of the shooting line;
5. The subject shoots the ball while it is moving;
6. The subject uses the stick to "dribble" the ball into position;
7. The subject leaves the shooting area to retrieve his or her own ball;
8. The subject moves his or her feet during the shot or follow through;
9. The subject takes a backswing;
10. The subject holds his or her stick below tape mark;

Cognitive (C)-C will involve all persons at the target even though the shooter is primarily the one to receive the instruction. I am going to make the very broad assumption that everyone can benefit from the instruction. If the teacher is in any way actively instructing the subject, the subject will be coded cognitive (C). This could be in the form of demonstration or lecture. As mentioned earlier the instruction is usually directed at the shooter but if the shooter is getting instruction, everyone at the target will be coded cognitive for the interval. The instruction can also come from another student.

Ontask(OT)-OT can be coded for the shooter and for the
retriever. If the subject is shooting but is between shots and waiting for the ball, the interval should be coded OT. The subject must be ready to shoot but waiting for the ball. If the subject is the retriever, he or she is on task when:

1. They are standing to the right of the target or behind the target depending on where their position is;
2. The side retriever retrieves balls that do not get past the front of the target and places them back at the shooting line as quickly as possible;
3. The back retriever retrieves balls that go through the target, balls that go over the target and balls that go beside the target. The back retriever is responsible for all balls that get past the front of the target;
4. They are standing up the target if it falls over;

Interim (I)-I is coded when the subjects cannot be involved in practice due to changing positions or equipment failure. Specifically, if the:
1. Target falls over;
2. Retriever can't get the ball because it is
lodged under the bleachers or rolls into someone else's shooting area;

3. Subject in the treatment group is writing his or her score on the card;

When the subjects are changing positions, the stick should be on the floor.

Offtask (OF)-OF is defined as any behavior not coded in one of the previous definitions. Specifically, if the retriever is:

1. Sitting down on the job;
2. Throwing or rolling the ball back to the shooter;
3. Tossing the ball to one's self;
4. Leaning on the target;
5. The shooter is swinging the stick for any purpose other than to make a shot or engaging in any activity other than shooting;

For purposes of uniformity, anytime the subject leaves the viewing area, he or she is coded OF.

Non-Motor Time (NMT)-Combination of C, OT, I, and OF. Created for analysis.
Appendix H

Definitions for Coding Student Practice Trials
DEFINITIONS FOR CODING STUDENT PRACTICE TRIALS

Motor Inappropriate Attempt (MIA)-A MIA is any trial that falls into one of the following categories.

1. The shooter swings but does not contact the ball.
2. The shooter contacts the ball, but the ball rolls to the target.
3. The shooter contacts the ball but the ball goes over the target or to the side of the target.
4. The shooter places the ball or moves the ball in front of the shooting line to take the shot.

Motor Appropriate Attempt (MAA)-A MAA is any trial that falls into following category.

1. The shooter swings and the ball goes into the air and hits anywhere on the target face but does not go in the hole. The shoot must be taken from behind the designated line.

Motor Appropriate Successful (MAS)-A MAS is any trial that is a MAA but goes into the hole in the target.

Motor Appropriate Trials (MAT)-Combination of MAA and MAS and was created for analysis.
Appendix I

Code Sheet for Practice Trials
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<th>SUBJECT 1</th>
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Appendix J

Tally Sheet
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Appendix K

Score Sheet for Pre and Posttest
SCORE SHEET

I.D.# ____________  

NAME____________________________

GRADE____  AGE______  DOB_______  SEX_____

Group:  control  trt

PRE-TEST SCORES (put a slash through each # that is motor appropriate and circle each trial that is successful)

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POST-TEST SCORES (put a slash through each # that is motor appropriate and circle each trial that is successful)

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Dear Parent:

Your son/daughter has been asked to participate in a research project. The purpose of this study is to obtain information regarding time on task and the use of performance standards in the physical education class.

The research study will include instruction and practice of a physical education skill that is new to your child. This motor skill is somewhat like skills that can be used in playing floor hockey. A plastic hockey stick is used to flip a hockey ball through a target that is six feet away. The object is to make as many as possible in the allotted time.

There is no more physical risk involved in this activity than in a regular physical education class. The instructor will explain to your child the skill to be performed during the class.

Prior to instruction in the task researchers will give your child a simple pre-test and following the instruction the same researchers will give a simple post-test. The class will be video-taped for later use in understanding how students learn best in physical education.

Your son/daughter will not be competing against other students in the class to see who is best. This activity does not or will not affect your child's grade in physical education.

The data collected in this study will be used in fulfillment of my doctoral degree from L.S.U. All information will remain confidential and your child will simply be identified by a number.

If you do not wish for you child to be a part of this study, please sign this letter and return it to the child's teacher.

Thanking You In Advance For Your Cooperation,

Rosaland V. Edwards
School of Health, Physical Education, Recreation and Dance L.S.U.
VITA

Rosaland Veatrice Edwards was born on June 18, 1952 in Hattiesburg, Mississippi. She attended elementary school in Beaumont, Mississippi and high school in Hattiesburg. Following graduation, she enrolled in Mississippi University for Women, Columbus, Mississippi, where she received a Bachelor of Science degree in physical education in May, 1974. In June, 1976, she enrolled in Livingston University, Livingston, Alabama, and received a Masters of Education in August, 1977.

From September, 1974 until May, 1977, Rosaland was employed by the Meridian Public Schools as a physical education teacher and coach. From September, 1977 until May, 1978, she was employed by Hinds-Rankin Urban Health Innovations Project, Brandon, Mississippi as a health education counselor. In 1978 Rosaland joined the Jackson Public School System, Jackson, Mississippi as a coordinator of elementary physical education. From September, 1981 to May, 1985 she was a teaching and research assistant at Louisiana State University, Baton Rouge Louisiana while pursuing a Doctor of Philosophy degree in professional preparation with a
specialization in elementary physical education and a minor in early childhood education. The Doctor of Philosophy was awarded in May, 1985.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Rosaland Veatrice Edwards

Major Field: HPERD (Professional Preparation)

Title of Dissertation: The Effects of Performance Standards on Behavior Patterns and Motor Skill Achievement in Children

Approved:

[Signatures]

Major Professor and Chairman
Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:
April 12, 1985