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**The Effectiveness of Two Commercial Golf Swing Training Aids
Used in Teaching a Beginning Golf Class**

by

Michael D. Hall

**A dissertation presented to the
Graduate faculty of Middle Tennessee State University
in partial fulfillment of the requirements
for the degree of Doctor of Arts**

August, 1999

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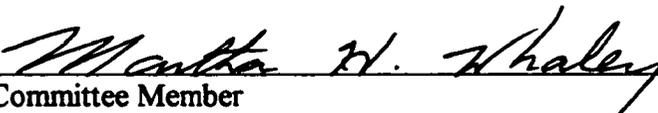
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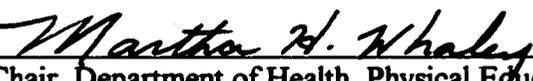
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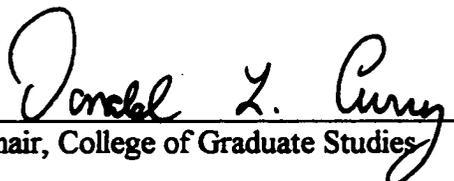
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Abstract

The purpose of this study was to investigate the effectiveness of two golf swing training aids when used in conjunction with teaching the golf swing to university physical education beginning golf classes. The subjects for this study were 65 students enrolled in two physical education beginning golf classes at the University of North Alabama, Florence, Alabama, in the Fall semester of 1998. The investigator taught both of the golf classes. Subjects were asked to complete a questionnaire which included questions regarding their golfing experience and ability. This information was used to group subjects into four ability levels. Based on this information, subjects were randomly assigned to one of three groups within each ability level. Subjects were pre- and posttested using the Green Middle Distance Item Iron Skills Test (Green et al., 1987). Eight students were dropped from the study because of excessive absences. Data analysis was performed on 57 subjects. This study took place twice a week over a 12-week period (24 classes) with each class period lasting 50 minutes. Training sessions consisted of each group (Experimental Group 1, Experimental Group 2, and Control Group) completing ten minutes of swing drills, using its assigned club, led by the instructor at the beginning of class. All three groups were given identical instructions during the ten minutes of swing drills. For the remaining class time (40 minutes) all students used the standard club.

A dependent t-test was performed on each of the three groups to determine if there was improvement within each group from pre- to posttest. Analysis of covariance (ANCOVA) was used to determine if there was a difference between groups. A significance level of .05 was used to determine whether or not a significant difference existed. The commercial training aids used in this study were not any more

effective than using the standard club when helping students to attain better scores on the Green Middle Distance Item Iron Skills Test (Green et al., 1987).

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To Kathy Robbins, my typist, you are worth more than I paid.

To my family and friends, you are truly a blessing!

To my wife Lisa, I’m back!

To David and Chris you are both very talented young men and I love you very much. You can reach any goal you set. Remember, anything worthwhile takes determination, sacrifice, and enthusiasm.

Dedicated to
Mom and Dad
“Pals Forever”

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Chapter 1

Introduction

Golfers around the country are constantly striving to improve their golf games. Since the earliest days of golf, its participants have been primarily interested in lowering their scores to gain more satisfaction from the sport. Over the years, numerous commercial golf swing training aids have been created to assist golfers hoping to develop the perfect golf swing, thus leading to lower scores on the links and more enjoyment. Many golf swing training aids can be traced back to the early 1900s (The Teaching and Training Aids Company, 1999).

In recent years, there has been a media blitz in which teaching aids, golf gimmicks, and novelty items have been highly marketed trying to attract golfers wanting to improve their golf swings. This is evident by the number of television infomercials, weekly and monthly golf magazines, videos, books, clinics, and golf schools available to both novice and experienced golfers. Golf training aids are available in an endless variety for each aspect of the sport including swinging, putting, chipping, pitching, driving, and mental preparation. Golfers will often pay top dollar for a quick fix to improve their scores; however, there is no guarantee that this will get to the root of the problem. The cost of these training aids can range from a few dollars to hundreds of dollars. It has become a very lucrative industry (Selcraig, 1998).

Even with limited scientific documentation for golf training aids, manufacturers continue to “market” their products claiming positive outcomes. Several golf training aids use marketing schemes such as “best on the market”, “guaranteed”, “will lower scores”,

“increase distance”, or testimonials from famous professional golfers. The Internet reveals over 140 web pages associated with golf training aids (Alta Vista, 1999). When using the internet Hot Bot search engine, over 5,000 hits were received keying in the term ‘golf training aids’. Additionally, trade journals and golf industry professionals further blur the issue of their effectiveness, especially on the golf swing, by promoting training devices based on non-scientific studies.

Statement of Problem

The purpose of this study is to examine the effectiveness of two commercial golf swing training aids when used to teach the golf swing to university physical education beginning golf classes. Two golf training aids making claims to significantly improve golf swings are the Assist Club and the Medicus Pro 5-Iron (Medicus Club). The Assist Club claims to be the “world’s best selling swing training aid and promises to eliminate slicing, increase distance, improve accuracy, and lower scores” (Matzie Golf Products, 1999). The Medicus Club makes similar claims concerning the golf swing and is marketed as the “best training aid available” (Shotsavers, Inc., 1999).

Need for the Study

A review of the literature indicates a controversy concerning the effectiveness of golf swing training aids. While a few golf training aids have been found to be beneficial, there appears to be some doubt regarding their effectiveness. There is a lack of scientific data investigating the claims that commercial golf training aids will significantly improve one’s golf swing. Research by Dexter-Fogarty (1995), Skrinar & Hoffman (1978), and Yost, Strauss, & Davis (1976) suggest further scientific

studies are needed to determine the overall usefulness and effectiveness of golf training aids that claim to improve one's swing.

The intent of a golf swing training aid is to help a golfer focus on the concept of that part of the skill on which the device is working. A training aid that would help students acquire a good fundamental golf swing would benefit not only the students but the instructor as well. Two of the most popular and widely used commercial golf swing training aids on the market today are the Assist Club and the Medicus Club.

The Assist Club focuses on the grip, backswing, and downswing. Hogan (1957) states "good golf begins with a good grip" (p. 18). Legendary teacher, Harvey Penick (1992), writes, "If you have a bad grip, you don't want a good swing" (p. 30). C. Parrish (personal communication, March 12, 1998) teaching pro at McFarland Park Golf Course, uses the Assist Club as a training aid when teaching many of his beginning golf students. The student's hands are put on the club in the correct position from the start. The weight of the club helps with the tempo of the swing and improves muscle memory.

The Medicus Club also focuses on the backswing and downswing. A common problem with beginning golfers is a quick, jerking or picking motion during the back swing (Armstrong, 1992). Nicklaus (1977) states, "I try, in fact, to take the club back ridiculously slowly for the first twelve inches. I believe it's impossible to take the club back too slowly over that initial distance" (p. 20). C. Burns (personal communication, February 23, 1999), teaching pro, states that the Medicus Club aids

in the slow, smooth backswing. It is for these reasons that the Assist Club and the Medicus Club were chosen to be investigated.

Hypotheses

For the purpose of this study, the following hypotheses will be tested:

Hypothesis 1. There will be no significant improvement in the adjusted posttest scores on the Green Middle Distance Item Iron Skills Test for subjects in the Assist Club Group, Medicus Club Group, and the Control Group.

Hypothesis 2. There will be no significant difference in the adjusted posttest scores on the Green Middle Distance Item Iron Skills Test between subjects in the Assist Club Group, Medicus Club Group, and the Control Group.

Limitations of the Study

The following conditions limited this study: 1) the population for this study was limited to students enrolled in two beginning golf classes at the University of North Alabama during the Fall 1998 semester; 2) regular attendance was an essential part of the study, but could not be controlled; and 3) the investigator did not have control over the golf ability levels of the subjects who enrolled for the classes.

Basic Assumptions

For the purpose of this study, it is assumed that the subjects will be equally motivated to perform at their best throughout the 10 week training period. It is also assumed that the students in the two beginning golf classes at the University of North Alabama are typical of students in beginning golf classes at other universities.

Definition of Terms

Commercial Golf Swing Training Aid. A device sold to consumers and marketed as a tool to acquire or improve the golfing swing.

Assist Club. Scientifically designed commercial golf swing training club engineered to improve every aspect of a player's swing. Features include patented training grip, precision bent shaft, and weighted club head (Matzie Golf Products, 1999).

Medicus Club (Medicus Pro 5-Iron). A commercial golf swing training club featuring a hinge which is engineered to bend whenever a flaw occurs in a person's swing. The Medicus Club is one of three models (putter and driver) manufactured by the Medicus Company (Shotsavers, Inc., 1999).

Commercial Training Device. A device sold to consumers and marketed as a tool to acquire or improve any aspect of the game of golf.

Golf Ability Level. For the purpose of this study, *golf ability level* is equivalent to one's playing experience, and/or skill. This was determined by having the subjects complete the M & M Golf Experience and Ability Screening Questionnaire (see Appendix A). Ability levels were used to place subjects into one of three groups using the stratified random method.

- Golf Ability Level 1 -- players that engage in playing eighteen holes of golf on a regular basis (more than 12 times a year).
- Golf Ability Level 2 -- players that engage in playing eighteen holes of golf less than 12 times a year.

- Golf Ability Level 3 -- players that have not played eighteen holes of golf in the last year.
- Golf Ability Level 4 -- players that have never played golf or taken lessons.

Green Middle Distance Item Iron Skills Test. An item test that measures the ability to hit approach shots onto a green using a full swing. Subjects are asked to select any iron and hit five golf balls at a line of flags 140 yards away (males) and 110 yards (females). Each subject is encouraged to hit the ball as close as possible to the line of flags. Subjects are allowed to change clubs throughout the test if they feel it will improve their distance or accuracy (Green, East, & Hensley, 1987).

Hosel. Curved area where the clubhead connects with the shaft (McCord, 1999).

Infomercial. Paid television commercial, usually lasting 30 minutes, used to market and sell a product.

Irons. Clubs of various lengths (2-9 irons, wedges) made with heads of metal. The higher the number on the club, the greater the loft of that club. For example, an 8-iron has more loft and less distance than a 5-iron (Folio & Nichols, 1997).

Middle Distance Shot. A stroke, which requires a full iron swing, played with the intention of landing on the putting surface.

Standard Club. Club that is approved for play by the United States Golf Association. The standard club is traditionally used in a regular golf class. For the purpose of this study, standard club refers to irons 2-9.

Chapter 2

Review of Literature

Of specific interest is the effectiveness of commercial golf swing training aids during formalized instruction. This question has been addressed very little in the literature. The majority of research has been carried out by the manufacturers themselves. Scientific studies, professional endorsements about individual golf training devices, and manufacturers' claims of research and testing add to the controversy of golf swing training aid effectiveness. The review of literature has been divided into three sections: (1) Manufacturer's Claims of Research and Testing; (2) Scientific Training Aid Effectiveness Studies; and (3) Golf Skills Tests for Measuring Playing Ability.

Manufacturers' Claims of Research and Testing

Manufacturers' claims of research and testing of golf swing training aid effectiveness is primarily based on the golfer's score improvement, testimonials, and endorsements. A golfer lowering his score 10 strokes is a logical way of showing improvement in his total golf game. However, this does not validate the effectiveness of the training aid that works on only one aspect of the game. The information in this section includes practices used by manufacturers to entice golfers to buy their products, but does not reflect other formal research studies.

At the 1999 Professional Golf Association (PGA) Merchandise Show in Orlando, Florida, over 100 vendors were represented in booths promoting various golf training aids. Each representative had a marketing strategy showing the superiority of

their training aid over other products. When asked for scientific documentation to substantiate the claims of training aid effectiveness, only one vendor produced impressive analysis results; however, he was unable to replicate scientific methods used to reach his statistical conclusions (1999 PGA Merchandise Show, personal communications, January 29, 1999).

Many golfing trade magazines and associations support their own rating systems for training aid effectiveness by producing volumes of marketing materials and personal testimonies which only serve to confuse the issue of individual training aid effectiveness. *Golf Magazine* uses a five star rating system when evaluating golf training aids in their monthly "Marketplace" column, but does not explain how a particular rating is assigned. *Golf Tips Magazine* uses no measurable rating system, but in its July 1997 issue Tomasi suggests to golfers the six best training aids on the market.

The PGA Tour Partners Club is an association that provides analytical results for training products tested for consumer use. The PGA Tour Partners Club grants a "Seal of Approval" if the product being evaluated by its members is rated above 70 percent. The approval measurement they used to determine the effectiveness of the device on trial is less than scientific, lending itself more to personal preference, ease of use, forgiveness, marketability, and packaging (see Appendix B). Concerning 16 separate training devices tested during an eighteen-month period, Jon Moebeck of the PGA Tour Partners Club adds,

"Extract from this what you will, but these statistics would seem to indicate people are less likely to recommend a training aid to other golfers than other

types of golf equipment. The fact that less than one-third of these tests received approval percentages over 80%, would also indicate that golfers aren't easily convinced when it comes to training aids (J. Moebeck, personal communication, 1999)."

All golf swing training aids, including the Assist Club and the Medicus Club, are marketed via magazines, internet, and/or infomercials and sold to golfers for the purpose of improving their golf games. Grover (1990) states, "Last year about \$450 million worth of goods were sold through infomercials." Bubniak (1998) reports that Adams' Golf's "Tight Lies" infomercial, which cost a little more than a half million dollars to produce in 1996, boosted sales of the Fairway/Utility Woods Company from \$3 million to \$30 million in one year.

Selcraig (1998) in *Golf Digest* asked Peter Harrold, President of U.S. Golf, about the effectiveness of the SAM 2000, a PVC training device. "Are there any genuine studies or independent tests, as the Federal Trade Commission requires, to support the claims made for the SAM 2000?" Harrold responded, "This is golf. This is not science. There's no scientific testing.... Our testing comes from actual people." Later, Harrold conceded that "referring to 'recent studies' may have been overreaching. I'll change that in the new [infomercial] script that I'm writing" (p. 188). U.S. Golf's Director of Marketing, Mike O'Leary, defends his training aids' effectiveness claims with the thousands of written personal testimonials showing improved golf handicaps from as much as 25 down to 10.

Veteran Federal Trade Commission attorney, Joel Winston, says, "Offering money back is not a defense against deceptive claims. Further, if the advertising refers

to any testing, or suggests that consumers can expect certain results, there must be valid evidence supporting the claim” (Selcraig, 1998, p. 189).

Most successful training aid manufacturers maintain their claims with the support of endorsements by golfing professionals, aspiring amateurs, average duffers, and the touring elite such as Jerry Pate, Lee Trevino, and Greg Norman. For example, Jerry Pate, PGA professional, was paid \$7,500 plus more than \$300,000 in royalties for a club that Pate admits he never carried in his golf bag. Lee Trevino was paid \$500,000 for endorsing a golf swing training aid. Greg Norman was allegedly paid \$1 million for endorsing his training aid marketed as “The Secret” (Selcraig, 1998).

Endorsements, regardless of sincerity, credibility, and eloquence, are still inconclusive vehicles to measure the teaching value of a single training aid. Endorsements are not based on empirical data, but rather appeal to the emotion, sensation, and aspirations of the average golfer. Few words in an endorsement actually represent a replicable method to test the true worth of a golf swing teaching aid. Products, which are not found by the public to be desirable or useful, rarely make it into pro shops, magazines, or other marketing media. A dichotomy between training aid effectiveness and advertising endorsement dollars exists due to the non-scientific methods applied to these types of training aid appraisals.

Scientific Training Aid Effectiveness Studies

Dexter-Fogarty (1995) note the paucity of research in this area. This is evident in the inconclusiveness of the scientific support for golf training aids on the market today as well. Kraft (1986) states in his article that golf magazines promote a

variety of gimmicks that guarantee to reduce your golf score by “x” number of strokes or increase your driving distance. He concluded that virtually all attempts at improving a golfer’s ability have met with disappointing results.

Chui (1965) conducted a study whose purpose was to determine the effectiveness of the Golf-O-Tron as a training aid compared to the effectiveness of a conventional practice range in a university beginning golf class. The Golf-O-Tron is an indoor electronic device that simulates the game of golf. After each shot, the approximate position in the fairway and the exact yardage of the ball is instantly shown. Regulation balls and clubs are used with this device. There were a total of 85 students selected from physical education classes and randomly assigned to control and experimental groups. Instruction and practice times were constant for both the experimental and control groups. A total of eight treatments was given over a four-week period. The same number of trials was performed at the practice range and on the Golf-O-Tron. Only the 7-iron was used during practice and instruction sessions. Subjects were pre- and posttested using a 7-iron and 4-iron test designed by Chui. The test was designed to measure two different golf skills, quality of contact and accuracy. The findings in this study showed significant improvement for subjects of both the control and experimental groups using the indoor electronic device. However, there was no significant difference at the .05 level in improvement between the Golf-O-Tron and the outdoor practice range.

Yost et al. (1976) investigated the effectiveness of the “Golfer’s Groove” as a training aid in a university physical education class. The “Golfer’s Groove” is a

training aid which has an adjustable plastic tube attached at its base of support. The plastic tube is adjusted to meet the physical characteristics of each student. The golfer stands inside the base and rests the hosel or shaft of the club on the plastic tube. The golfer then swings the club keeping contact with the plastic tube. This study included 35 students from two physical education golf classes. Subjects were beginning golfers who had received no previous formal training or instruction in golf skills. They were randomly selected and divided into a control group and an experimental group. The experimental group included 15 students who used the "Golfer's Groove" for half of their class and the control group included the remaining 20 students who used traditional teaching techniques during all of their class time. The classes met three times a week for six weeks (18 class hours). The students were pre- and posttested using a test developed by the authors. This test utilized rubber practice golf balls and regulation clubs. Each student was given 10 shots at the target. The pre- and posttest scores of the control group were used to verify the reliability of the test. The Pearson Product Moment Correlation between the pre- and posttest score was .97. An analysis of covariance was chosen as the statistical design. The pretest scores of the control group were lower than the pretest scores of the experimental group; therefore, the posttest scores of each group were adjusted accordingly. Yost et al. (1976) concluded that the "Golfer's Groove" has been shown to improve significantly the accuracy with which college students can be taught to drive a golf ball.

Skrinar et al. (1978) conducted a study which also investigated the effectiveness of the "Golfer's Groove" as a training aid for beginning golfers.

Skrinar's study included 14 students from a beginning golf class. The study lasted seven and a half weeks, which included 30 one-hour sessions. Five sessions were set aside for administration of pre- and posttests. Prior to initiating the experiment, class instruction was provided for proper golf club grip. The subjects were videotaped hitting golf balls at a target 140 yards away. Each had four trials. Subjects were also tested indoors using the Vanderhoof golf test with each subject given 15 trials. At this point, subjects were matched and then randomly divided into groups based on the Vanderhoof test. The Vanderhoof test uses plastic whiffle golf balls and a regulation five iron. Unlike Yost et al. (1976), Skrinar went a step further in his study by including a professional golfer's analysis of the subjects' swings that were captured on video. Two PGA teaching pros rated the pre- and posttest swing video on a seven-point scale. Skrinar also required a comparable number of trial swings for the Groove and the Non-Groove groups, which provided a measurable constant that the Yost et al. study failed to furnish. Skrinar et al. (1978) concluded that the subject's use of the "Golfer's Groove" in this study was not effective in the attainment of higher skills test scores and/or higher swing rating by golf professionals.

Dexter-Fogarty (1995) conducted a study to demonstrate the effectiveness of the Tutor hinged club as a training aid for 14 novice golfers. The Tutor is a five-iron club with a hinge that will theoretically break if the golf swing is performed incorrectly. The Tutor can also be used like a standard five-iron. The participants for this study were volunteers from various lecture courses from Springfield College. This study lasted three weeks. Pretest and posttest video sessions were used to

examine differences among the experimental and control groups. Differences were examined by studying the area of the hub path, club head angular velocity prior to impact, and the percentage of center of mass shift. A total of three 2x2x3 mixed factorial analyses of variance were computed. The level of significance for this study was .05. No significant differences were found when analyzing the main effects of the area of the hub path, club head angular velocity prior to impact, and the percentage of center of mass shift. For all variables, golfers did not improve or become more consistent after practice with the hinged club.

Fahleson, Kozar, Vaughn, and Harris (1997) investigated the AccuSwing training aid as a supplement in a university physical education golf class. The AccuSwing is a Velcro training aid that adheres to an iron or driver to indicate both where the ball (AccuSwing ball) was struck, and from what angle. Thirty-five students completed the posttest; however, 11 students from the Control group were dropped due to missing three or more practice sessions. Statistical analysis was derived from 24 students, 16 in the AccuSwing group and 8 in the Control group. Pretest scores were used to match students and then they were randomly assigned to one of the two groups. A total of eight practice sessions was held in a four-week period. During each session, students completed 30 swings with either the AccuSwing training aid (Treatment Group) or with whiffle golf balls (Control Group) as well as putting green and driving range practice. All students were pre- and posttested using a pitch and five-iron test. The pitch test was a variation of the Nelson pitch test and the five-iron test was a variation of the Benson golf skills test.

All subjects improved significantly from pretest to posttest for the pitch test. However, this was not true for the five-iron test. The treatment group, which used the AccuSwing training aid, showed significant improvement on both tests. The control group showed improvement on the pitch test but not on the five-iron test.

Students completed a questionnaire at the end of this study and provided additional information regarding motivational aspects of practicing with the AccuSwing device. The majority of the AccuSwing group indicated that they liked the practice technique and stated that it helped them improve, but they felt that they needed more practice with the device. The control group indicated that they did not like the practice technique (whiffle balls) although they felt it helped. It was concluded that the AccuSwing device provided feedback and practice that kept the students who were involved in this study interested in practicing which could lead to more improvement.

Golf Skills Tests for Measuring Playing Ability

A golf skills test may be given for one or several of the following reasons: achievement, improvement, evaluation of unit of instruction, evaluation of program, classification, motivation, prediction, diagnosis, or grading (Safrit, 1990). According to Baumgartner and Jackson (1987) the achievement of sports skills can be measured by three general means: rating scales, the performance itself, and skills test.

Several studies including Skrinar et al. (1978) and Austin and Miller (1992) have used golf professionals to rate a student's golf swing to assess if there has been an improvement in the swing. Mason and Burkhardt (1973), Kraft (1983), and

Davidson and Templin (1986) utilized the student's score during a round of golf as their standard of measure.

Safrit (1990) stressed the importance of making objective rather than subjective judgments. Green et al. (1987) warned of the many problems related to skills tests by acknowledging that "many of these tests have been validated incorrectly, suffer from poor reliability, are time-consuming to administer and score, or simply fail to meet the varying needs of physical education teachers" (p. 72).

Green (1972) conducted a study to develop an array of golf skills tests for college men. Twenty subjects from a pool of 49 volunteers were used in each of the six tests. The golf skills included: the short putt, the long putt, the chip shot, the pitch shot, the middle distance iron shot, and the drive shot. The step-wise multiple regression program was the statistical technique used in validating the test battery. He concluded that the six skills tests used in his study could be used to determine effectively the golfing ability of male college golfers. Administrative time may be an important factor in a study, so a two- or three-battery test may be given effectively in lieu of the full battery. The middle distance shot was the best single predictor of a golfer's score.

Green et al. (1987) investigated the validity and reliability of the Green Golf Test which consisted of six parts: short putts, long putts, pitching, chipping, middle iron shots, and the drive shot. Over 1,000 college students of varying golfing abilities were used in this study; however, most were enrolled in beginning golf classes. A group of 146 students was given the full test battery over a two-day period. These

data were used to determine the reliability of each test item. Sixty-five college students were used to determine the validity of the test battery to measure one's overall golfing ability. Thirty-six holes of golf was the criterion measure. It was concluded that the Green Golf Test is a valid and reliable test for assessing golf playing ability of college male and female students.

Joyner (1992) completed a study entitled, "Descriptive and Predictive Discriminate Analysis of Golf Ability of College Males". This study examined the differences in golfing ability of college males and attempted to predict golfing ability based on performance in a series of golf skills tests. Sixty college males were placed into three groups based on their average self-reported golf scores. The subjects were tested during the fall and winter quarters at the University of Georgia golf course. Based on his review of literature, he selected the test battery (driving test, middle distance test, pitch test, chip test, and putt test) validated by Green et al. (1987). Joyner concluded that the difference in golfing skill levels can be determined by the driver, pitch, and putt tests.

Chapter 3

Methods and Procedures

The purpose of this chapter is to describe the methods and procedures used in the collection and analysis of data in this study of the effectiveness of two commercial golf swing training aids used in teaching a beginning golf class. The following topics discussed in this chapter include: the pilot study, selection of subjects, equipment, pretest/posttest data collection, and a description of statistical analysis of data.

Pilot Study

A pilot study was conducted during the spring semester of 1994 at the University of North Alabama comparing two commercial golf swing training aids (Assist Club and the Medicus pro 5-Iron) to the standard club. The Benson 5-iron skills test was used to evaluate distance and accuracy for beginning golfers. As a result of the pilot study, it was found that the administration procedure of this skill test made it difficult to determine the accuracy of distance and deviation in relation to where the ball landed. In addition, the subjects were randomly assigned to groups, without regard to golf ability levels, making the groups unequal with respect to ability level from the start of the study; therefore, the test results were questionable.

The results of the pilot study led the researcher to develop the M & M Golf Experience and Ability Screening Questionnaire. Responses from this questionnaire allowed the investigator to place students into one of four golf ability levels. Based on this information, subjects were equally placed into one of three groups, two

experimental groups and one control group. As a result of the pilot study, the investigator added 10 minutes of organized swing drills, to be led by the instructor, at the beginning of each class. Ten golf swing drills were chosen from McLean (1990) so that a new swing drill was introduced each week over a 10 week training period (see Appendix C). Each swing drill was used for one week (two class periods). The Benson 5-iron skills test was replaced with the Green Middle Distance Item Iron Skills Test (Green et al., 1987) to measure the effectiveness of the golf swing (see Appendix D). To improve the data collection process, the investigator designed a scoring sheet to accommodate the new skills test (see Appendix E).

Selection of Subjects

The investigator secured approval from the Institutional Review Board at Middle Tennessee State University and the Human Subjects Committee at the University of North Alabama before beginning this study (see Appendices F and G, respectively). Subjects for this study were students enrolled in two physical education beginning golf classes at the University of North Alabama, Florence, Alabama, during the Fall semester of 1998.

Orientation

On the first day of class, the investigator provided orientation to both beginning golf classes which included an overview of the game of golf and viewing of "The Little Red Video" (Penick 1993), which demonstrated the basic golf swing. The students were informed of all aspects of the study. Students were told of possible risks and benefits associated with this study. Students were given the opportunity to

ask questions, were informed that participation in this study would not affect their grades, and were asked to sign consent to participate forms (see Appendix H). A total of 65 students from both classes agreed to take part in the study. There were 48 males and 17 females ranging in age from 18 to 43. The investigator was assigned to teach both of the golf classes.

Each subject was then asked to complete the M & M Golf Experience and Ability Screening Questionnaire which asked questions regarding their previous golfing experience and ability level. Based on the information collected from this questionnaire, all 65 subjects were divided into one of four golf ability levels. Level 1 included subjects who had played golf (18 holes) more than 12 times a year. Level 2 included subjects who had played golf (18 holes) 12 times or less during the past year. Level 3 included subjects who had played golf (18 holes) but not in the last year. Level 4 included subjects who had never played golf (18 holes) nor taken lessons (see Table 1).

Table 1. Golf Ability Levels of Participants

Level	Amount of Golf Played (18 holes)	Number of Participants
1	12 or more times per year	5
2	less than 12 times per year	16
3	has not played in last year	31
4	has never played	<u>13</u>
Total		65

After the golf ability levels were established, subjects in both classes were randomly assigned to one of three groups--two experimental groups and one control group (see Table 2).

Table 2. Groups by Golf Ability Level

Group	Level				Group Total
	1	2	3	4	
Experimental Group 1	2	5	11	4	22
Experimental Group 2	2	5	10	5	22
Control Group	1	6	10	4	21
Level Totals	5	16	31	13	65

Each group was assigned a different club--Experimental Group 1 (Assist Club Group), Experimental Group 2 (Medicus Club Group), and the remaining students using the standard club were placed into the Control Group. During the 10 minute golf swing training drill session conducted at the beginning of each class, the subjects in each group used only the club assigned to their group.

The subjects for this study were asked not to practice or play golf outside of the regular classes during the 10 weeks of golf swing training. Each subject was instructed to keep a student log throughout the duration of the study to record comments and questions concerning the golf swing.

Duration of the Study

This study took place over a 12 week period (24 classes). Each class met twice a week for 50 minutes. The first week (two classes) was devoted to gathering pretest data using the Green Middle Distance Item Iron Skills Test (Green et al., 1987). The next 10 weeks (20 classes) were used to implement the training sessions (10 minutes of swing drills with the assigned club) and the remaining week (two classes) was used to administer the posttest also using the Green Middle Distance Item Iron Skills Test (Green et al., 1987).

Pretest - Green Middle Distance Item Iron Skills Test

During the first week, subjects were pretested using the Green Middle Distance Item Iron Skills Test (Green et al., 1987). All testing took place at McFarland Park Driving Range, Florence, Alabama. New Spalding range golf balls were used in the pre- and posttests. Ten dozen balls were numbered in sequence of

five. Each set of five balls was marked with a colored (red, blue, black, or green) permanent marker. The teeing area was a heavy-duty grass-like mat. Subjects used Spalding Top Plus clubs, which were made available. Subjects were allowed to hit five unmarked practice balls at the far end of the range before taking the test. Each subject was then given five numbered balls and instructed to select any iron (2-9) and hit each ball toward a line of flags placed across a flat open fairway--140 yards for men and 110 yards for women (see Appendix I). The subjects were allowed to change irons at any time if they felt they could improve their scores. After all five balls were hit, each ball was scored by measuring the perpendicular distance the ball came to rest from the line of flags. During the pretest, no instruction or training was given. The pretest was administered and all data were collected and recorded by the investigator.

Golf Swing Training Drills

Upon completion of the pretest data collection, the 10 week golf swing training drill sessions began. All three groups, using their assigned clubs, received identical instructions during the 10 minutes of golf swing training drills. Ten golf swing drills were selected from McLean (1990) with a new drill being introduced each week so that each drill was used for two training sessions (see Table 3).

Table 3. Golf Swing Drills Used in Training Sessions.

Week	Drill*
1	Three Steps to a Perfect Backswing
2	"Toe Up" Drill
3	"Thumbs Up" Drill
4	"Baseball" Drill
5	Stop'n Go Drill
6	"Big Mo" Drill
7	Drag the Club Through
8	Right Arm Toss Drill
9	Make Your Legs Initiate the Downswing
10	Emulate a Pro Drill

*Each drill was used for two training sessions

Training sessions consisted of each group (Assist Club Group, Medicus Club Group, and Control Group) completing 10 minutes of golf swing drills at the beginning of the class using their assigned club. Each 10 minute swing drill training session started with a signal from the instructor for each group to go to their assigned area where all three groups could follow the instruction. Subjects arriving late to class were asked to make-up the 10 minute golf swing training drill, which was administered by the instructor, at the end of class. No make-up sessions were given to students not attending class. After each 10 minute golf swing training drill session, all subjects

proceeded to the driving range where all three groups completed the remaining 40 minutes of instruction using a standard club (see Table 4).

Table 4. Class Time Table.

Activity	Time (minutes)	Club
Attendance and Warm-up	5	none
Treatment	10	assigned club
Review	5	standard club
Daily Lesson	10	standard club
Driving Range	15	standard club
Review	5	standard club
Total Minutes	50	

The instructor kept a daily log noting swing drills used each class period, observations, weather conditions, student comments, and problem areas. Due to excess absenteeism, eight students (five males and 3 females) were dropped from this study--Assist Club Group - 3 students, Medicus Club Group - 3 students, Control Group - 2 students (see Table 5).

Table 5. Students Dropped From Study.

Training Aid	Number of Students	
	Dropped	Completed
Assist	2	20
Medicus	3	19
Regular	3	18
Total Students	8	57

Posttest

At the end of 10 weeks of training, the subjects were given a posttest using the Green Middle Distance Item Iron Skills Test (Green et al., 1987). The posttest was administered and all data were collected and recorded by the investigator.

Statistical Analysis of Data

Using Statistical Analysis System (SAS), a dependent t-test and analysis of covariance (ANCOVA) were used to analyze the data collected in this study. A significance level of .05 was used in this investigation. ANCOVA was used to compare the three groups (Assist Club Group, Medicus Club Group, and the Control Group). The pretest scores were the covariate. Posttest scores were adjusted to ensure that all groups were at the same ability level prior to the training session. A training session for this study was 10 minutes of golf swing training drills with each group using their assigned club. The dependent variable was the posttest score.

Chapter 4

Analysis of Data

Introduction

The purpose of this chapter is to present the analysis of data collected to investigate the effectiveness of two commercial golf swing training aids when used in conjunction with teaching the golf swing to university physical education beginning golf classes. This analysis of data includes: dependent t-tests, summary statistics, preliminary analysis to justify the use of analysis of covariance, and analysis of covariance. The significant level of interest was .05. All scores recorded on the Green Middle Distance Item Iron Skills Test reflected the number of yards the ball came to rest from the line of flags; consequently, lower scores are indicative of a better middle distance iron golf shot.

The subjects for this study were 65 students enrolled in two physical education beginning golf classes (Physical Education 108-01 and 108-02) at the University of North Alabama, Florence, Alabama, in the Fall semester of 1998. Using the M & M Golf Experience and Ability Screening Questionnaire, subjects were randomly placed into one of three groups based on golfing experience and ability. Eight students were dropped from the study because of excessive absences (Assist Club Group - 2 students; Medicus Club Group - 3 students; and Control Group - 3 students). Data collection and analysis was completed on the remaining 57 students.

Dependent t-test

A dependent t-test was performed on each of the three groups to see if there was any improvement within each group from pre- to posttest. The results from the dependent t-test are presented in Table 6.

Table 6. Dependent t-test.

Groups	Pretest Mean (SD)	Posttest Mean (SD)	Difference In Mean	t-value	Significance
Assist Club Group	31.00 (19.72)	24.45 (15.88)	-6.55	-1.79	0.0435
Medicus Club Group	33.26 (22.78)	26.32 (14.72)	-6.95	-1.74	0.0481
Control Group	34.67 (26.00)	25.50 (18.41)	-9.17	-2.13	0.0232

N = 57

(Assist Club Group = 20, Medicus Club Group = 19, Control Group = 18)

It is evident that each group, independently, improved significantly from pre- to posttest. Consequently, the difference in pretest and posttest means appears as a negative number. On the basis of these results, Hypothesis 1, which states there will be no significant improvement in the adjusted posttest scores on the Green Middle Distance Item Iron Skills Test for subjects in the Assist Club Group, Medicus Club

Group, and the Control Group, was rejected. The raw data, skewness, kurtosis, and correlation for each of these dependent t-tests can be found in Appendix J. These results indicate that all groups significantly improved from pretest to posttest. Therefore, examination of the groups was justified and an analysis of covariance was conducted.

Preliminary Analysis

In order to justify the use of analysis of covariance, a preliminary analysis was performed to test the assumption of equal slopes for the regression lines within these groups. This analysis is displayed in Table 7.

Table 7. A Preliminary Analysis to Justify Use of ANCOVA.

Part 1

Source	df	Sum of Squares	Mean Square	F-value	Significance
Model	5	6299.9874	1259.9948	7.85	0.0001
Error	51	8185.7319	160.5045		
Total	56	14485.7193			

Part 2

Source	df	Type III Sum of Squares	Mean Square	F-value	Significance
Group	2	60.4031	30.2016	0.19	0.8290
Pretest	1	5975.8412	5975.8412	37.23	0.0001
Interaction (G x P)	2	40.3361	20.1681	0.13	0.8822

Part 1 of Table 7 is presented for completeness. It reveals that the overall model, which allowed a separate slope coefficient for each of the three groups, was significant (.0001). Therefore, group related information helps to explain the variation in posttest scores. Part 2 of Table 7 serves to explain the significance revealed in Part 1. In particular, the pretest mean square (5975.8412) was significant, thereby indicating that pretest score is useful as a covariate for the study of posttest score. The mean square for group by pretest interaction is 20.1681. The significance level of the interaction (group x pretest) was greater than .05 (.8822) confirming that the assumption of equal slopes is justified. Consequently, an analysis of covariance could be used to investigate differences between group means. It is interesting to note that the significance level for group (.8290) given in Part 2 suggests that group effects are negligible; however, the following analysis of covariance provides a more appropriate basis for such a conclusion (see Table 7).

Analysis of Covariance

The results from the Analysis of Covariance are presented in Table 8. Part 1 of Table 8 demonstrates the significance of the overall model (.0001) based on the assumption of a common slope coefficient for the three groups (see Table 8).

Table 8. Analysis of Covariance Pertaining to Posttest Scores Using Pretest Score as a Covariate.

Part 1

Source	df	Sum of Squares	Mean Square	F-value	Significance
Model	3	6259.6513	2086.5504	13.44	0.0001
Error	53	8226.0680	155.2088		
Total	56	14485.7193			

Part 2

Source	df	Type III Sum of Squares	Mean Square	F-value	Significance
Group	2	20.1943	10.0971	0.07	0.9371
Pretest	1	6225.4873	6225.4873	40.11	0.0001

In Part 2 of Table 8, the sum of squares for the model has been partitioned using Type III sum of squares to reflect the group and pretest-covariate sources of variation. Thus, we see that the group mean square (10.0971) was not significant (.9371). Consequently, these results indicate that there is no significant difference between groups. Thus, Hypothesis 2, which states that there will be no significant difference in the adjusted posttest scores on the Green Middle Distance Item Iron Skills Test between subjects in the Assist Club Group, Medicus Club Group, and the Control Group, was supported.

Chapter 5

Conclusions and Recommendations

The purpose of this study was to investigate the effectiveness of two different golf swing training aids when used in teaching a beginning golf class. The subjects for this study were 65 students enrolled in two physical education beginning golf classes at the University of North Alabama, Florence, Alabama, in the Fall semester of 1998. The investigator taught both of the golf classes. Subjects were asked to complete a questionnaire which included questions regarding their golfing experience and ability. This information was used to group subjects into four ability levels. Based on this information, subjects were randomly assigned to one of three groups within each ability level. Subjects were pre- and posttested using the Green Middle Distance Iron Skills Test (Green et al., 1987). Eight students were dropped from the study because of excessive absences. Data analysis was performed on 57 subjects. This study took place over a 12-week period with each class meeting twice a week for 50 minutes.

A dependent t-test was performed on each of the three groups to determine if there was improvement within each group from pre- to posttest. Analysis of covariance (ANCOVA) was used to determine if there was a difference between groups. A significance level of .05 was used to determine whether or not a significant difference existed.

Conclusions

Based on the results presented in Chapter 4, the adjusted posttest mean scores of the subjects in each of the three groups decreased significantly from the pretest scores thus validating the use of all three clubs to aid in the teaching of the golf swing to beginning golf classes. Therefore, the following hypothesis was rejected:

Hypothesis 1. There will be no significant improvement in the adjusted posttest scores on the Green Middle Distance Item Iron Skills Test for subjects in the Assist Club Group, the Medicus Club Group, and the Control Group.

An analysis of covariance revealed that, although each group showed improvement within itself from pre- to posttest scores, no one group improved more than another. The device used in the training sessions had no significant effect on the outcome of the scores of the three groups on the Green Middle Distance Item Iron Skills Test. Based on this information, the following hypothesis was not rejected:

Hypothesis 2. There will be no significant difference in posttest scores on the Green Middle Distance Item Iron Skills Test between students in the Assist Club Group, the Medicus Club Group, and the Control Group after adjusting for pretest scores.

Discussion

The purpose of this study was to compare the effectiveness of two commercial golf swing training aids used to teach the golf swing to beginning golf students in a university setting. With education budgets decreasing annually and a

greater demand for quality instruction, it is imperative that the best teaching aids are selected for the golf curriculum while keeping within budget constraints.

Physical education departments must closely scrutinize all equipment purchases. Many commercial golf training aids can cost hundreds of dollars. It is for this reason that more scientific studies are needed to determine the overall effectiveness of golf training aids. Otherwise, physical education departments must base their golf training aid purchases on manufacturers' biased claims rather than on sound scientific evidence of the effectiveness of a training aid. The results of this study indicate that the two training aids compared showed no more effectiveness than the standard club and all groups equally improved.

Since all groups equally improved, but no group improved significantly more than another, it could be suggested that the improvement was derived from instruction and swing drills rather than a specific training aid or club.

There were 10 weeks provided for training after the pretest during this study. The investigator noted that if a similar separate study was performed with a higher frequency of testing, the results might indicate a learning curve difference between the experimental and control groups in the earlier weeks of training.

The majority of student golfers indicated in their student logs a desire to use the training aids over the standard club. The fact that pre- and posttest scores showed the training aid result as inconsequential, indicate that adult learning styles must be considered as additional factors in teaching the golf swing. Individual learning styles tend to lead students to gravitate towards learning methods that appeal to

them. Student motivation, intensity, interest, and desire to learn are influenced by the perceived training aid effectiveness over traditional instruction and practice with standard clubs.

The two commercial training devices used in this study were not any more effective than using the standard club when helping students to attain better scores on the Green Middle Distance Item Iron Skills Test (Green et al., 1987).

Observations

Throughout the course of this study the investigator kept a daily log and noted the following observations:

1. During the pretest, students had poor grips, did not line up correctly, and most did not go through a pre-shot routine.
2. Students in ability levels 1 and 2 suggested that they hit the ball better in the pretest than in the posttest because they had been playing all summer, whereas they were asked not to play outside of class for the purpose of this study.
3. During the first three weeks of the 10 minutes golf swing drill training sessions, students were very intense.
4. All students were very interested in the golf swing training aids.
5. Students with the commercial golf swing training aids openly commented that their group did better.
6. Students with the commercial golf swing training aids appeared more on task during training sessions.

7. The weather was in the mid-80s for the pretest and upper 70s for the posttest. There was no rain during any of the class meetings.

Recommendations for Further Study

Based on the findings of this study, it is recommended that further study might incorporate the following suggestions:

1. Duplicate the study using subjects that have never played golf.
2. Duplicate the study using subjects who are advanced golfers only.
3. Test the subjects more often (every two or three weeks).
4. Investigate other commercial golf training aids.
5. Implement an instruction-free group for each training aid.
6. Provide longer training sessions (more than 10 weeks).
7. Have training sessions meet more times per week (i.e., summer school 4-5 days per week).
8. A survey should be developed to gather student opinions of the effectiveness of golf training aids.

Appendix A
M & M Golf Experience and Ability
Screening Questionnaire

PE 108
M & M Golf Experience and Ability
Screening Questionnaire*

Day _____
Time _____

Name _____ Classification _____ Major _____

1. Male _____ Female _____
2. Age _____
3. Right-handed _____ Left-handed _____
4. Have you ever taken golf lessons? No _____ Yes _____
(if yes, when, where, and date of last lesson)
5. How often do you play golf? (choose one)

Handicap (if known) _____
I have never played golf before _____
I have not played golf in _____ years.
I play less than 12 times a year _____
I play _____ times a month.
I play _____ times a week.

6. Do you have your own set of clubs? No _____ Yes _____
7. Is this course required in your major? No _____ Yes _____
(if no, why are you taking this class?)
8. How many holes are played in a regulation round of golf? _____
9. Define the following:

Dogleg:

Bogey:

Birdie:

Par:

*Created by Jon MacBeth and Mike Hall, 1997

Appendix B

Partners Club Product Test Form

Member Name _____ Member Number _____

Product Tested: (Insert 12)89

	Yes	No
Would you recommend the product to fellow Club members?	<input type="radio"/>	<input type="radio"/>
The suggested retail price is \$ (insert 13) At this price, do you feel this product is a good value?	<input type="radio"/>	<input type="radio"/>

Please rate the product tested on the criteria listed below. Due to the diversity of products in the test program, some of the criteria may not be applicable. In such cases, please blacken the "N/A" circle.

Completely blacken the circle indicating your choice

	Poor	Fair	Good	Excellent	N/A
Game improvement	<input type="radio"/>				
Packaging	<input type="radio"/>				
Design	<input type="radio"/>				
Clarity of instructions	<input type="radio"/>				
Ease of use	<input type="radio"/>				
Durability	<input type="radio"/>				
Control	<input type="radio"/>				
Feel	<input type="radio"/>				
Distance	<input type="radio"/>				
Forgiveness	<input type="radio"/>				
Value	<input type="radio"/>				
Accuracy	<input type="radio"/>				
Comfort	<input type="radio"/>				
Effectiveness	<input type="radio"/>				
Appearance	<input type="radio"/>				
Rated against similar products	<input type="radio"/>				
Weight	<input type="radio"/>				
Quality	<input type="radio"/>				
Accuracy of manufacturer claims	<input type="radio"/>				

Overall rating

(insert 14): (These sections are for specific questions from the manufacturer.)

(insert 15):

(please attach additional pages if needed)

Thank you for participating in the PARTNERS CLUB Product Test Program

Appendix C

Swing Drills Taken From McLean, 1990

Swing Drills taken from McLean, 1990

Three Steps to a Perfect Backswing

Purpose: A solid, consistent downswing is the product of being positioned correctly at the top of the backswing. Unfortunately, you can't see yourself at the instant the backswing is completed, so it is difficult to discern whether every feature of it is correct.

The following drill ensures that all features of the top-of-backswing position are correct. It guarantees a fairly straight left arm. It sets the club in the "slot," so it is parallel to the target line. It sets the club face in the correct "square" position, with the toe of the club pointing almost directly at the ground. It encourages a full turn with plenty of muscle extension.

Do this drill regularly (it can be done at home without fear of breaking furniture), and you'll gain the proper sensation of a solid backswing. You'll then find it easy to transfer the feeling to your actual swing on the course.

Procedure: Assume your normal address position (illustration 1). Now simply cock your wrists upwards so the clubhead is pointing skywards (2). Lift your arms just above your forehead. Finally, rotate your shoulders as far as possible, allowing your hips to turn and your left knee to move to the right (3). Hold the position so as to gain a solid impression of the feeling. As illustration 3 shows, you are now in a correct backswing position.

You can actually hit ball from this position by simply turning back a bit farther and then beginning the downswing. Ken Venturi used this drill often.

'Toe-Up' Drill Teaches Square Clubface

Purpose: perhaps the biggest challenge in golf is to make the clubface return to the ball in a perfectly square position. This is much easier to accomplish if you can keep the clubface in the same position relative to your arms and hand throughout the swing. Poor players almost always manipulate the clubface into a poor position during the swing by twisting their arms and hands, in turn making their impact position inconsistent. The following drill teaches the square position and makes it easy to monitor whether it is correct.

Procedure: Address the ball with the clubface square to the target. Swing the club halfway back so your hands are at hip level and the shaft is almost parallel to the ground (illustration 1). Stop and note the position of the clubhead. The toe of the club should be pointing directly toward the sky. Now swing into a follow-through and stop when your hands are at hip level and the shaft is parallel to the ground (2). Again, the toe should be pointing toward the sky.

When the toe of the club is pointing at the sky at these mid-swing positions, the clubface is square and it will be much easier to return the clubface to square at impact. If the toe is pointing behind you on the backswing, the clubface is excessively open and is likely to be that way at impact. If the toe points directly in front of you on the backswing, it is closed and the clubface will be pointing left, or closed, at impact.

Practice this drill often until you can keep the clubface square at all stages of the swing.

'Thumbs Up' Drill Creates Model Backswing

Purpose: A correct backswing requires coordinated movement of arms and body. They must work in harmony with each other, or else your timing and swing mechanics are disrupted and you'll be inconsistent. The following drill encourages proper arm and body movement and results in a solid, one-piece takeaway that is simple and easy to repeat.

Procedure: Assume the correct stance and posture. Extend your arms and clasp your hands as shown, left hand below forming a triangle with your arms. Now swing halfway back and halfway into a follow-through, initiating movement with your shoulders.

At the completion of your half backswing, your thumbs should be pointing skyward (1). On the follow-through, your thumbs also should be pointing upward (2). You should use the same motion in your actual swing to encourage correct arm and hand movement in relation to your body (3).

'Baseball' Drill Improves Weight Transfer

Purpose: A smooth but aggressive weight shift on the downswing is vital in every golf swing. The following drill shows you how to drive off your right foot on the downswing so that at impact, the majority of your weight is on your left foot.

Procedure: Tee a ball and assume your normal address position. Now draw your left foot back so your feet are together. Begin your backswing (illustration 1), but just before it is completed, stride forward with your left foot (2), just as a baseball player does when stepping into a pitch. Try to hit the ball solidly. In order to time your swing

properly, you'll find it necessary to swing smoothly, with your weight shifting to your left side slowly but emphatically.

Stop'n Go Drill

Purpose: This drill encourages connection of the arms and body and teaches you to place your arms exactly where you want them. It helps you take the hands out of the swing, makes you get off your right side quickly and helps you feel the lower body leading. Jim Albus, a club pro on Long Island and an excellent player, showed me this drill years ago and I use it a great deal in my teaching.

Procedure: From your address position, take the club back normally (1,2), then stop approximately halfway down (3). In this stopped position, your body should look very much like the accompanying illustration. Your weight distribution is back to about 50/50. Your knees have started to move down the line. Your left arm is approximately parallel to the ground and straight and your right elbow is close to your side, under the left elbow.

Hold this position for a few seconds then, using your hips and legs rotate your body quickly to the target. Your arms should stay with your body. Go to a full finish (4). You should feel no active use of the hands in the swing. Your speed is generated by your body rotation.

'Big Mo' Drill Improves body Action

Purpose: In a good swing, the body responds to the swinging of the hands and arms. This allows the body parts to perform naturally and in the correct sequence. The following swing exercise, which I call "The Big Mo" because it describes the motion

involved in swinging the club, will ingrain the feeling of the clubhead merely swinging back and through, with the body reacting to the action of the hands and arms.

Procedure: Using an iron, begin making small swings back and forth, allowing the natural momentum of the hands, arms and club to turn your body on the backhand forward swings. Do not, however, try to make your arms swing independently from the body, or vice versa. When you reach the midpoint of your follow-through with your hands at about waist height, allow gravity to pull the club back down and immediately make another backswing. Gradually increase the size of your swing, until you eventually are making full, uninterrupted swings. At all times, concentrate on feeling the clubhead merely swinging back and through.

Drag the Club Through to Improve Angle of Approach

Purpose: Many high-handicappers are aware that swing path is a culprit in poor shots, but few are aware of how important it is to make the clubhead approach the ball at the proper angle. If you swing down too steeply and take deep divots, you'll have difficulty hitting the ball solidly with a square club face. The following drill, devised by Gardner Dickinson, help you swing so the clubface approaches the ball at a shallower angle, ensuring solid, consistent contact. This is a great drill for good players. It produces the feeling of taking the hands out of the swing going through the ball.

Procedure: Address an imaginary ball and take your normal stance, but set the clubhead down outside of your right foot, as I'm demonstrating in illustration 1. Make sure the clubhead is inside the target line and the face is open. Now drag the clubhead forward through the imaginary ball (2), making a conscious effort to close the clubface

with both hands. On the follow-through (3), the toe of the clubface should point skyward. Continue through to a full, balanced finish (4), consciously extending your right arm while the left arm folds at the elbow.

This will give you the sensation of a shallower angle of approach through impact and into the finish.

Right Arm Toss Drill

Purpose: The motion of the right arm during the swing is similar to the motion performed when throwing a ball underhand. Emulating that throwing motion heightens your sense of feel. The following is a great drill, one I use often in my teaching, for improving right-side control.

Procedure: Grip a club in your right hand only and address a spot on the turf with or without a ball (illustration 1). Swing the club back about the distance you normally would (2). To start the downswing, take a small step forward with your left foot and then swing through as though you were actually going to throw the club toward your target. Without actually letting go of the club, let it swing through of its own momentum into a full, relaxed follow-through (3, 4, 5). Repeat several times.

Make Your legs Initiate the Downswing

Purpose: “Left side control” is an elusive phrase that is difficult to incorporate into your swing. The following drill will do it. In addition to strengthening your left arm, hand and side, it will teach you to use your legs in the swing and prevent casting from the top.

Procedure: Gripping an iron with your left hand only, address a spot on the turf and make as full a backswing as you can, concentrating on swinging slowly (illustration 1). Start the downswing by sliding your legs toward the target (2). You may feel as though the hips are starting the downswing, which is fine, but in any case your lower body should initiate the move down. Swing through to a full finish, allowing your left arm to fold at the beginning of the follow-through (3). Repeat this drill often, perhaps 25 to 30 times daily.

Emulate a Pro to Achieve Good Balance-the Reflex Drill

Purpose: If you examine the follow-through of any number of touring professionals, you'll notice one striking similarity: At the conclusion of the swing, they invariably allow the club to return to a balanced position in front of their body. This accomplishes several things. First, because the spine straightens out, it relieves pressure on the lower back. Second, it makes it immeasurably easier to maintain your balance with most of your weight on your left side. Finally, arriving at this position indicates that you've swung aggressively through the ball.

Procedure: Try to copy this position as you hit balls. With some practice, it will become second nature and you'll find you are swinging with more power and better balance.

Feet-together Drill Cures Many Ills

Purpose: Few drills are as all-encompassing as the Feet-Together Drill, which is why it is one of the most popular practice exercises in use today. It promotes good footwork and balance, encourages a free arm swing and prevents swings. It teaches you

to swing rhythmically and within your physical capabilities, thereby improving your timing and swing mechanics.

Procedure: with the ball teed, practice hitting balls with your feet touching (illustrations 1, 2, 3). Concentrate on making solid contact rather than hitting the ball a long distance. Once you can hit good shots consistently, try hitting shots with the ball on the turf.

Appendix D

Green Middle Distance Item Iron Skills Test

Green Middle Distance Item Iron Skills Test

The Green Middle Distance Item Iron Skills Test is described as an approach shot to the green from a distance requiring a full swing with an iron. The subjects were instructed to select any iron and hit the ball towards a row of flags placed across a flat open fairway (one hundred forty yards for men and one hundred and ten yards away for women) (appendix). The subjects were allowed to change irons if they felt they could improve their scores. Each ball was scored the perpendicular distance it came to rest from the line of flags. Scoring took place after the subjects had completed their trials.

Educational Application: Males and females from junior high through college.

Administrative Feasibility

Time: One 60 minute class period for 20 subjects.

Training involved: Five practice shots are allowed for each student immediately prior to being tested.

Equipment and Supplies: Golf balls, 5-irons, marking flags or signs.

Accessories: Scoring materials.

Facilities and Space: Outdoor driving range or similar hitting area that has minimum measurements of 150 x 100 yards.

Directions

Subjects were allowed to hit five practice balls at the far end of the range before taking the test. Each subject was given five numbered balls. Subjects were instructed to hit the balls in order. The investigator scored each of the balls where it landed after each group of subjects completed the test. The score was derived by the sum of the perpendicular distance (to the nearest yard) the ball came to rest from the line of flags. Subjects are allowed to change clubs at any time during the test if they feel it will improve their score.

Scientific Authenticity

The Reliability Coefficient of the Green Middle Distance Shot is 85 (Green, East, & Hensley, 1987).

Criterion Measure: Official score for round of golf.

Sequence of Instruction

***All class sessions will start with each group doing ten minutes of swing drills with their assigned clubs. Material from previous classes will be reviewed.**

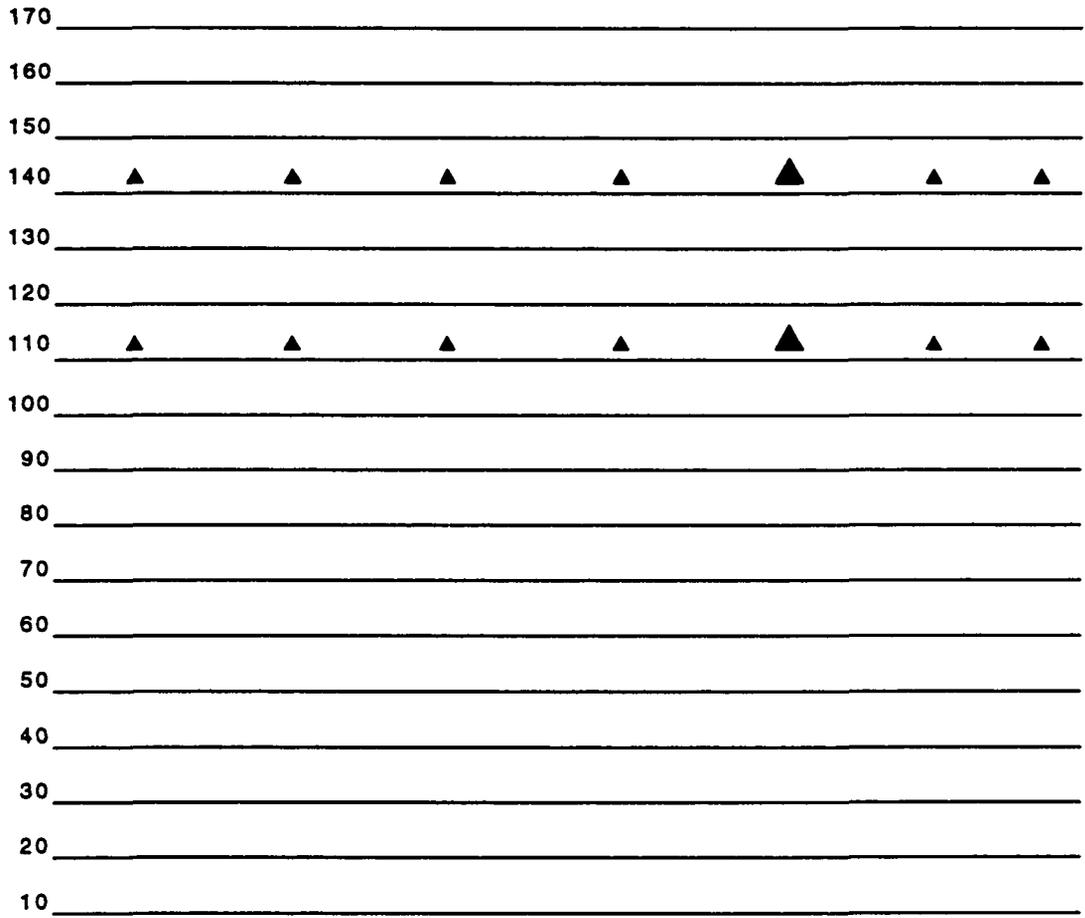
Week of August 23-29	Introduction, grip, stance, and alignment
Week of August 30 - Sept 5	Pre-test
Week #1 September 6-12	*Review grip, stance, and alignment
Week #2 September 13-19	*Full swing 5-iron
Week #3 September 20-26	*Learning from the flight of the ball
Week #4 September 27 - Oct 3	*Full swing 5- 7-iron
Week #5 October 4-10	*Full swing 8- pw
Week #6 October 11-17	*Full swing 3 and 4 irons
Week #7 October 18-24	*Full swing 3, 5, 6, & 7 woods
Week #8 October 25-31	*Full swing driver
Week #9 November 1-7	*Target game "PAR"
Week #10 November 8-14	*Full swing any club
Week of November 15-21	Post-test
Week of November 22 - Dec 12	Chipping and putting

Appendix E
Score Sheet

Name: _____

Class: _____ Time: _____

Score Sheet



Color _____

Ball Number:

Distance from Line of Flags:

Appendix F

Approval From Institutional Review Board

Middle Tennessee State University

School of Nursing



P.O. Box 81
Middle Tennessee State University
Murfreesboro, Tennessee 37132
(615) 898-2437

To: Michael D. Hall, Assistant Professor
Health, Physical Education and Recreation
University of North Alabama
UNA Box 5073
Florence, AL 35632-0001

From: Susan R. Seager, EdD, RN *SR*
Chair, Institutional Review Board

Re: "A Comparison of two teaching aids in a university physical education
beginning golf course"
(IRB Protocol Number: 99-005)

Date: August 26, 1998

The above named human subjects research proposal has been reviewed and approved. This approval is for one year only. Should the project extend beyond one year or should you desire to change the research protocol in any way, you must submit a memo describing the proposed changes or reasons for extension to your college's IRB representative for review. Best of luck in the successful completion of your research.

cc: Jon MacBeth



A Tennessee Board of Regents Institution

MTSU is an equal opportunity, non-racially identifiable, educational institution that does not discriminate against individuals with disabilities.

Appendix G
Approval From University of North Alabama
Human Subjects Committee



UNIVERSITY
of **NORTH**
ALABAMA

Florence, Alabama 35632-0001

Office of Research
UNA Box 5121
(256) 765-4221
Fax (256) 765-4329

MEMORANDUM

TO: Michael D. Hall, Assistant Professor, Health, Physical Education and Recreation

FROM: Dr. G. Daniel Howard, Vice President for University Advancement, Dean of Research, and Assistant to the President

DATE: August 24, 1998

RE: Expedited Review of A Comparison of Two Teaching Aids in a University Physical Education Beginning Golf Class

It is with great pleasure that I approve your application for use of human subjects in your project entitled *A Comparison of Two Teaching Aids in a University Physical Education Beginning Golf Class*.



G.D.H.

GDH/go

pc: Dr. Priscilla Holland

Appendix H

Consent to Participate in an Experimental Study

CONSENT TO PARTICIPATE IN AN EXPERIMENTAL STUDY

TITLE: A comparison of two teaching aids in a university physical education beginning golf class.

INVESTIGATOR: Mr. Mike Hall
 Department of Physical Education and Recreation
 University of North Alabama
 Florence, AL 35632

DESCRIPTION OF STUDY:

The purpose of this study is to compare teaching beginning golf classes using the traditional method both with and without the ASSIST Club and the Medicus Pro 5 Iron Club. The subjects will be placed into three groups using a stratified random selection process. All groups will be pre and post-tested at the end of ten week. The pre and post-tested will consist of a Green middle distance test evaluating distance and accuracy. Group I will be introduced to the ASSIST Club. Group II will be introduced to the Medicus Pro 5 Iron Club. Group III will be the control group and will receive no treatment. All groups will do ten minutes of swing drill only with the club assigned to its group. The study will take place twice a week for ten weeks with each session lasting 50 minutes.

Participant's Initials _____

RISK AND BENEFITS:

A common risk associated with physical activity is muscle soreness and stiffness. Also, frustration may occur while trying to master a complex motor skill.

The benefits would include building a sound fundamental base in which a lifetime recreational activity may be obtained. The subjects would also have access to the ASSIST Club, Medicus Pro 5 Iron Club, and video tape which has an approximate value of one hundred dollars.

CONFIDENTIALITY:

All subjects names and scores will be kept confidential. When the study results are published they will be disguised so that identification cannot be made.

RIGHT TO WITHDRAW:

You are free to refuse to participate in this experiment at any time. To withdraw from this study, contact Mr. Hall and inform him of your decision to withdraw. You may withdraw in person, by telephone, or by letter. Withdrawal will not effect your grade in any way.

Participant's Initials _____

COMPENSATION FOR ILLNESS OR INJURY:

In the event of physical illness or injury resulting from this research, no monetary compensation will be made.

VOLUNTARY CONSENT:

I certify that I have read this consent form or that it has been read to me and that I understand its content. I acknowledge that I have been given the opportunity to ask questions regarding the study, hazards, discomforts, and benefits that were not clear to me. Questions I asked were fully answered. I understand that further questions will be answered by Mr. Hall. A copy of this consent form has been given to me. My signature below means that I freely agree to participate in this experimental study.

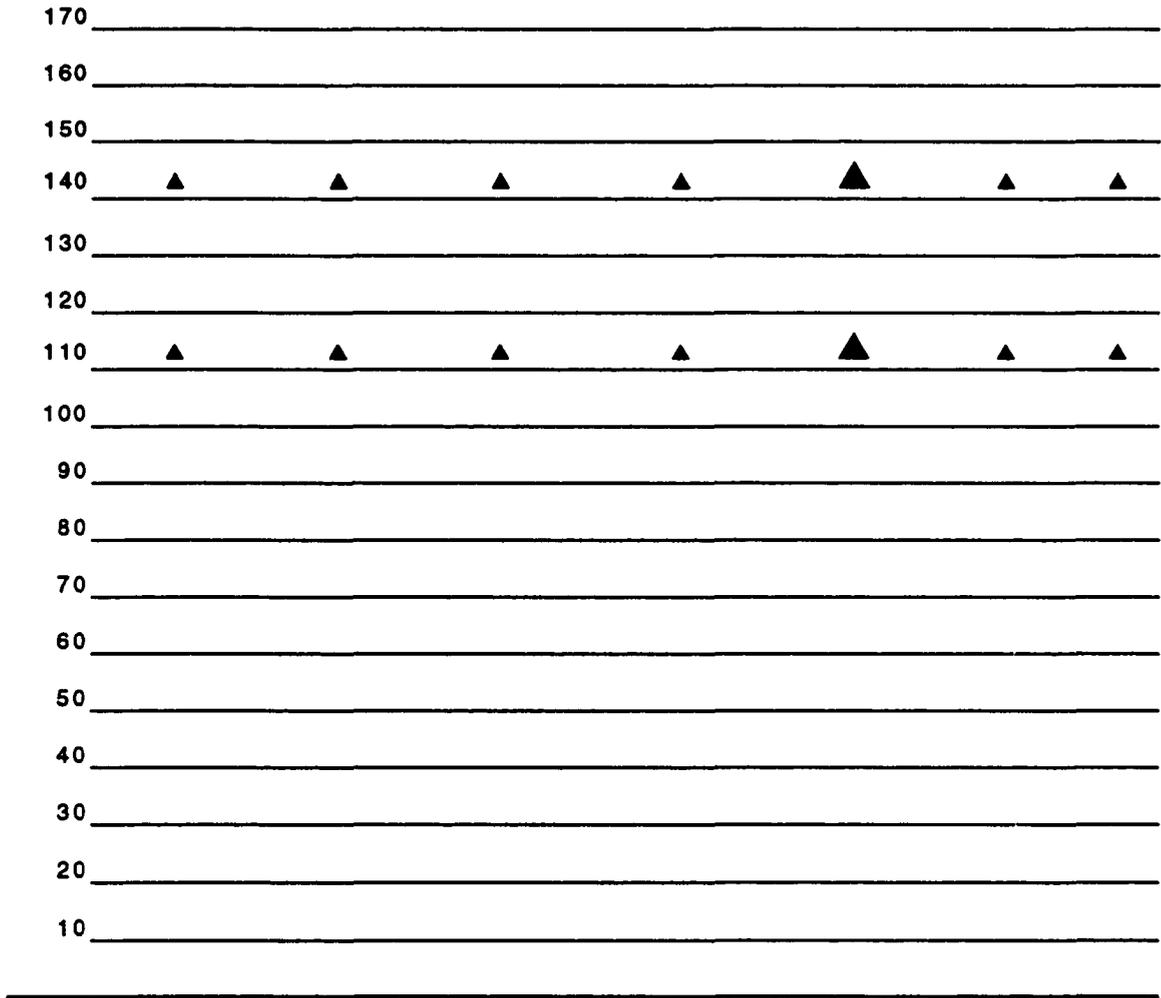
Date _____

Participant Signature _____

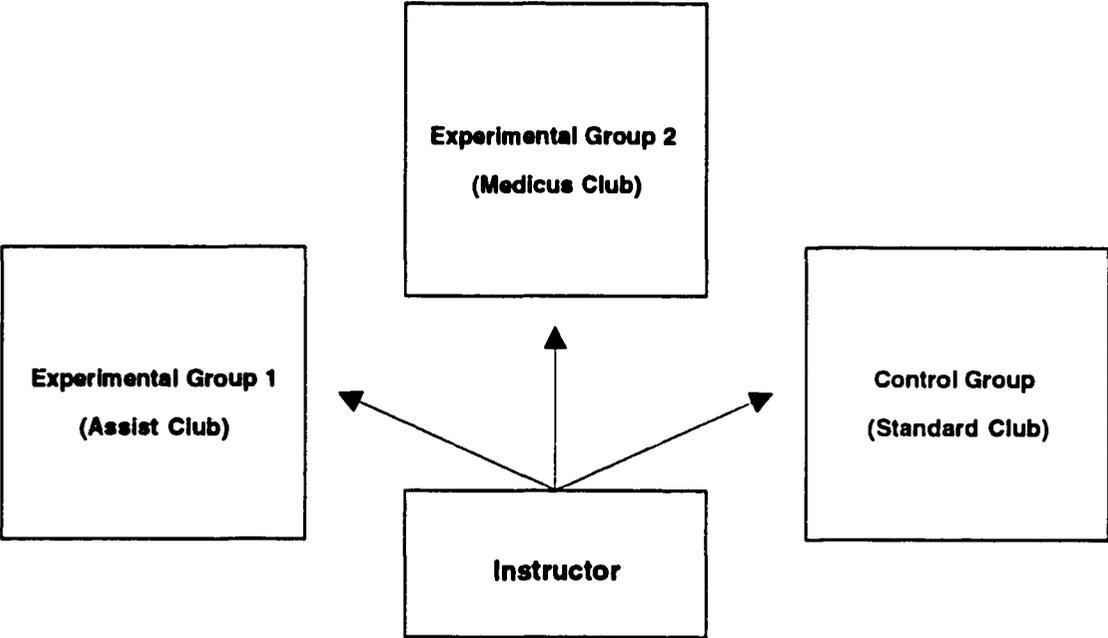
Witness _____

Appendix I
Diagram of Test Range

Diagram of Green Middle Distance Item Iron Skills Test Range



Layout of 10 Minute Swing Drill Training Session Instruction Area



Appendix J
Raw Data for Assist Club Group, Medicus Club Group,
and Control Group

Number of Yards Balls Landed From Line of Flags
Experimental Group 1 - Assist Club Group

Subject	Pretest Score	Posttest Score
1	41	2
2	21	9
3	25	40
4	11	28
5	21	19
6	14	29
7	13	4
8	29	18
9	56	32
10	44	38
11	79	39
12	9	11
13	9	7
14	67	57
15	37	38
16	11	23
17	35	11
18	41	43
19	36	37
20	21	4
Mean	31.00	24.45
Standard Deviation	19.72	15.88
Skewness	0.936	0.183
Kurtosis	0.488	-0.969
Difference in Means	-6.55	
t-value	-1.79	
Significance	0.0435	
Correlation	0.59620	

Number of Yards Balls Landed From Line of Flags
Experimental Group 2 - Medicus Club Group

Subject	Pretest Score	Posttest Score
1	10	23
2	37	25
3	49	40
4	5	8
5	11	14
6	20	30
7	66	15
8	30	40
9	25	36
10	26	8
11	25	25
12	38	14
13	28	20
14	4	5
15	33	44
16	85	53
17	21	14
18	41	37
19	78	49
Mean	33.26	26.32
Standard Deviation	22.78	14.72
Skewness	0.960	0.183
Kurtosis	0.488	-.969
Difference in Means	-6.95	
t-value	-1.74	
Significance	0.0481	
Correlation	0.64676	

Number of Yards Balls Landed From Line of Flags
Control Group - Standard Club

Subject	Pretest Score	Posttest Score
1	10	4
2	10	11
3	8	11
4	19	11
5	32	25
6	39	28
7	54	61
8	89	76
9	8	10
10	19	11
11	22	20
12	16	28
13	83	22
14	67	31
15	37	24
16	28	40
17	19	16
18	65	30
Mean	34.67	25.50
Standard Deviation	26.00	18.41
Skewness	0.931	1.590
Kurtosis	-.330	2.658
Difference in Means	-9.17	
T-value	-2.13	
Significance	0.0232	
Correlation	0.71334	

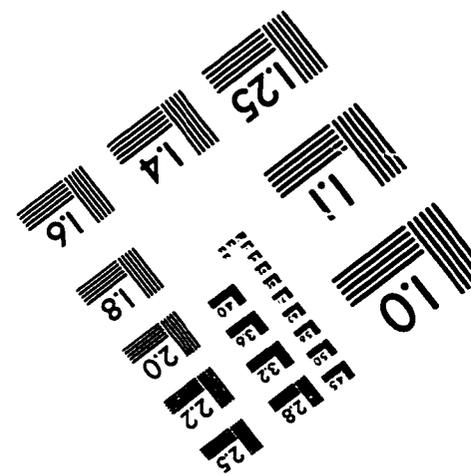
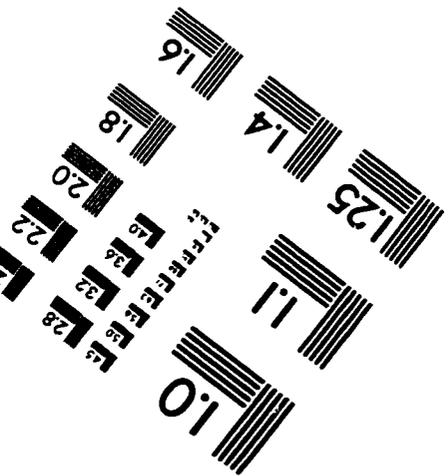
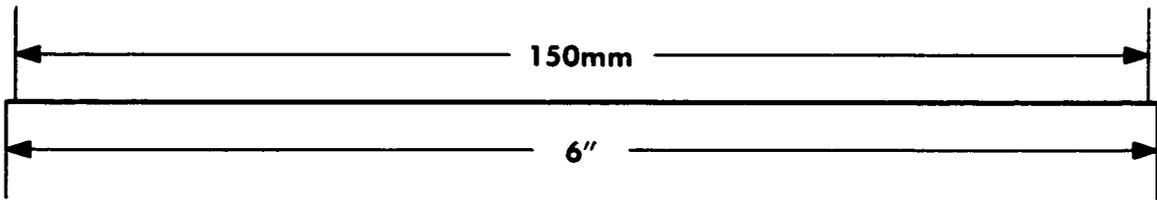
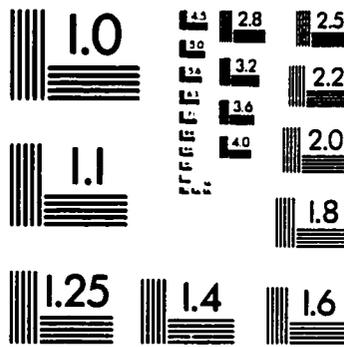
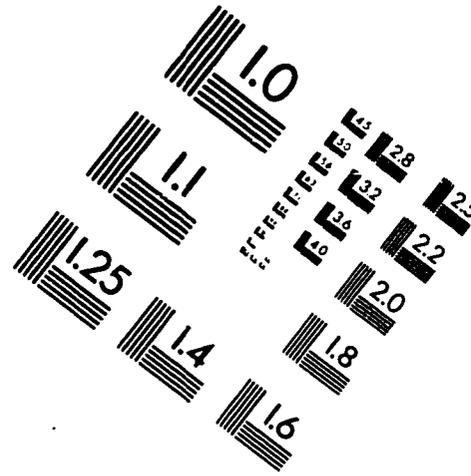
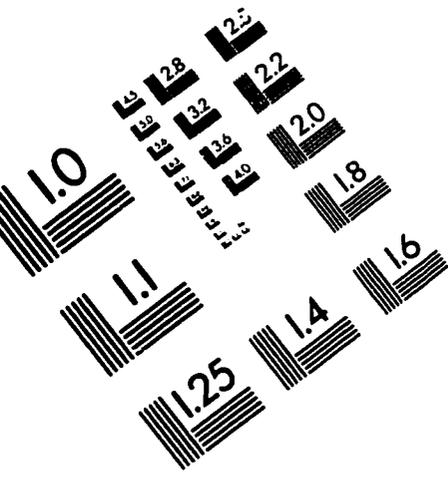
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IMAGE EVALUATION TEST TARGET (QA-3)



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