

ABSTRACT

PETHAN, S.P. Effects of training in Strength Shoes™ on speed, jumping ability, and calf girth. MS in Adult Fitness/ Cardiac Rehabilitation, 1993, 35 pp. (J. Porcari)

72 collegiate males between 19-25 years of age were randomized into 1 of 3 groups (24 per group); a control group (CG), a strength shoe group (SSG), or a regular shoe group (RSG). SSG and RSG trained 3x per week for 10 weeks and followed identical programs as prescribed by the manufacturer. SSG wore the Strength Shoe™ while RSG wore their own athletic shoes. All Ss were tested before and after the 10 weeks for 40 yard dash time (40 TIME), vertical jump (VJUMP), broad jump (BJUMP), and right and left calf girth (RGIRTH & LGIRTH). RESULTS: 22 C, 14 SSG, and 16 RSG completed the study. 7 of the dropouts in SSG were due to injury; 1 of 8 dropouts in RSG was due to injury. Attendance for SSG and RSG averaged 89% of possible workouts. Changes as a result of the program are presented below:

Group	40 TIME (sec)	VJUMP (in)	BJUMP (in)	RGIRTH (in)	LGIRTH (in)
C	+0.04	-0.4	+0.0	+0.1	+0.0
SSG	-0.06	+0.9	+0.9	+0.4*	+0.3*
RSG	-0.03	+0.1	+1.1	+0.2	+0.1

\*Significant change from pretesting (p < .05)

SSG had significant (p < .05) increases in RGIRTH and LGIRTH from pre to posttesting. However, this change was not significantly (p > .05) different than either C or RSG. There were no within or between group differences for 40 TIME, VJUMP, or BJUMP as a result of training. These results indicate that even though there was a tendency for training in Strength Shoes™ to improve performance, the increases were not significantly greater than training in regular athletic shoes. Additionally, the chances of injury appear to be greater when training in Strength Shoes™.

EFFECTS OF TRAINING IN STRENGTH SHOES™ ON  
SPEED, JUMPING ABILITY, AND CALF GIRTH

A MANUSCRIPT STYLE THESIS PRESENTED  
TO  
THE GRADUATE FACULTY  
UNIVERSITY OF WISCONSIN-LA CROSSE

IN PARTIAL FULFILLMENT  
OF THE REQUIREMENT FOR THE  
MASTERS OF SCIENCE DEGREE

BY  
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COLLEGE OF HEALTH, PHYSICAL EDUCATION, AND RECREATION  
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Master of Science in Adult Fitness/Cardiac Rehabilitation

The candidate has successfully completed his/her final oral examination.

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EFFECTS OF TRAINING IN STRENGTH SHOES™ ON  
SPEED, JUMPING ABILITY, AND CALF GIRTH

INTRODUCTION

Speed and power are fundamental aspects of almost every sport. To a large degree it is felt that these are two qualities that can't be taught, but are inherited. However, research has shown that speed and power can be enhanced through training (9).

There are several methods to increase speed and power in athletes. The two major ways are speed training and plyometrics. Speed training is the technique of breaking down the sport of sprinting into three separate components: sprinting (full speed, full recovery), relaxation, and power production (6). Sprinting can be trained through repetitions of short distances (30 - 100 M), done at or near full speed. The intensities and rest interval are changed throughout the course of a season to avoid plateauing. During a workout, the athlete should be fully recovered before sprinting to remain loose and relaxed even if intensity might have to be decreased slightly. Relaxation in speed training is important because sprinting is basically rapid firing of motor units. Relaxed runners will allow their muscles to contract more forcefully because of

less tension inhibiting the speed and force of the contraction (6). An increase in muscle strength can either be obtained through better recruitment of muscle fibers, or increased strength of individual muscle fibers. Power production is important because a greater force against the ground will enable an athlete to produce a longer stride. A longer stride means less ground contact and a greater stride frequency which results in more speed.

The second way of increasing speed and power is plyometrics. Plyometrics is defined as the rapid stretching and contraction of a muscle (13). As a muscle is stretched, elastic energy is stored in the tendons and muscles. When the contraction is carried out, the muscle and the stored energy combine to produce a stronger contraction. In a vertical jump, the use of elastic energy accounts for approximately 12% of the total jump height (12). Plyometric training also "teaches" your nervous system and muscles to respond with maximal speed to the lengthening of a muscle, enabling that muscle to contract with maximal force. The most common type of plyometric drills are: hops, skips, bounds, and jumps. A relatively new product on the market reported to increase sprinting speed and jumping ability is the Strength Shoe™. The Strength Shoe™ is a shoe with a platform coming out of the front half of the sole (see Appendix A), and is designed to overload the calf muscles and achilles tendon to a greater degree than normal.

Normally, 30% of the body weight is supported by the ball of the foot and toes. When wearing Strength Shoes™, the heel doesn't touch the ground, thus 100% of the body weight is supported by the ball of the foot. While this added overload may have some beneficial training effect, it may also predispose an athlete to injury. Strength Footwear Inc., the company that markets the Strength Shoe™, has made several claims about the shoe. They claim that by training in the Strength Shoe™, an athlete can expect to see a reduction of .2 seconds in the 40 yard dash, an increase of 5-9 inches in vertical jump, and an increase of up to 2 inches in calf girth. These claims have never been tested.

The purpose of this study was twofold: first, test the effectiveness of the Strength Shoe™ against the company's claims and second, investigate the likelihood of potential injuries to the participants training in the Strength Shoes™.

#### METHODS

##### Subjects

Seventy-two subjects gave their informed consent (see Appendix B) to participate in this study. The subjects were recruited from the general college population at the University of Wisconsin-LaCrosse. Subjects were recruited by responding to an advertisement (see Appendix C) in the university newspaper and by returning a flyer sent to all male students living in the dormitories on campus. The

potential subjects had to be between 18-35 years of age and not currently active in a collegiate sport or weight training their lower body.

The 72 subjects were randomized into 1 of 3 study groups. Group 1 was the control group (CG). Subjects in the CG completed the pretesting and posttesting only and were instructed not to train between testing sessions. Group 2 was the Strength Shoe group (SSG). Subjects in the SSG trained for 10 weeks while wearing Strength Shoes™. Group 3 was the regular shoe group (RSG). These subjects followed an identical training program as the SSG, but wore their own athletic shoes.

#### Testing

Pretests and posttests were administered to all subjects in four areas: 40 yard dash, vertical jump, standing broad jump, and right and left calf girth. Pretests and posttests were conducted at the same time of day and all tests were given in the same order for all subjects. The same testers conducted both the pretesting and posttesting.

#### 40 Yard Dash

The 40 yard dash was administered by having the subject take their mark and begin running when they were ready. The timer used a digital stopwatch and timed from the subjects first movement until the subjects crossed the line at the 40 yard mark. No starting blocks were used and the best time of two trials was recorded. Time was recorded to the

nearest 1/100th of a second.

#### Vertical Jump

Vertical jump was measured using a Sargent Jump. The subjects stood flat-footed with feet shoulder width apart. Subjects were able to swing their arms and flex their knees before jumping. The subjects jumped off both feet and reached as high as possible against the Vertec machine (3) (see Appendix D). The Vertec measures vertical jump height to the nearest 1/2 inch. The best jump of two trials was recorded.

#### Standing Broad Jump

Standing broad jump was given next. The subjects stood with both feet perpendicular to a marked line. They were allowed to swing their arms and flex their knees as much as they desired prior to jumping. When subjects were ready, they jumped out as far horizontally as possible. The measurement was taken from the nearest heel to the starting mark. In order for the jump to count, the subject could not fall forward or backward on landing. A tape measure taped to the floor was used to assess the jumping distance to the nearest 1/2 inch and the farthest of two jumps was used in the analysis.

#### Maximal Calf Girth

Left and right calf girth were measured by using anthropometric measurements. The subject sat on a table with both legs extended. The researcher palpated where the

tibia and femur met, which is called the knee joint line, and measured 15 centimeters distal to this point. A mark was placed on both legs at that point and a spring loaded tape measure was used to measure the circumference of the calf. Both the right and left calves were measured in this fashion. Measurements were made to the nearest .10 cm. Values were later converted to inches.

#### Training Protocol

Subjects in the SSG and RSG trained 3 times per week for 10 consecutive weeks and followed identical programs. The only difference was that SSG wore the Strength Shoe™ and RSG wore their own athletic shoes. The training protocol was outlined by Strength Footwear Inc. (see Appendix E). The training program consisted of three phases: beginner, intermediate, and advanced, lasting 2, 4, and 4 weeks, respectively. During the week prior to beginning the study, SSG and RSG practiced drills and SSG wore the Strength Shoes™. The only modifications to the manufacturer's training program was that subjects were given 1 day off during week 3 in the intermediate phase (due to Thanksgiving recess) and 1 day off during week 3 of the advanced phase (due to subject fatigue). There were 28 total training sessions.

### STATISTICAL ANALYSIS

Pretesting scores for each variable were compared across groups using a one-way ANOVA. Results of training from pretesting to posttesting were analyzed using a two-way ANOVA with repeated measures. When a significant F ratio was found, a Scheffe's post-hoc test was used to determine differences between means. Alpha was set at .05 to achieve statistical significance for all analyses.

### RESULTS

Fifty-six of the original 72 subjects completed the study. Two subjects dropped out of CG, 10 out of SSG, and 8 out of RSG. The reasons for the subjects dropping out are given in Table 1. The loss of subjects varied, but in the SSG 7 out of 10 were due to injury while only 1 out of 8 in the RSG was because of injury. Subjects in both groups attended an average of 25.8 of a possible 28 training sessions (89%). The results of this study were followed and reported in a local newspaper (see Appendix F).

Table 1. Reasons for subjects dropping out

Reason:	Control group	Strength group	Regular group
Lost to follow-up	2		
Time conflict		2	4
Ankle injury		2	
Knee injury			1
Groin pull		1	
Shin splints		2	
Achilles tendinitis		1	
Strained achilles		1	
Knee injury unrelated to study		1	
Dropped out of school			1
Poor attendance			2
Total	2	10	8

The descriptive characteristics of the 56 subjects who completed the study are in Table 2. There were no significant ( $p > .05$ ) differences between groups for age, height, or weight at the beginning of the study.

Table 2. Descriptive characteristics of subjects who completed the study (N = 52)

Group	(n)	Age (yrs) $\bar{x} \pm SD$	Height (in) $\bar{x} \pm SD$	Weight (lbs) $\bar{x} \pm SD$
Control	(22)	20.5 $\pm$ 2.06	71.6 $\pm$ 2.58	171.7 $\pm$ 27.19
SSG	(14)	20.4 $\pm$ 2.24	71.5 $\pm$ 1.65	169.9 $\pm$ 15.42
RSG	(16)	21.3 $\pm$ 3.61	71.2 $\pm$ 2.41	175.9 $\pm$ 20.23

The results of the training program are presented in Table 3. The SSG had significant ( $p < .05$ ) increases in both right and left calf girth from pretest to posttest. However, these changes were not significantly ( $p > .05$ ) greater than either C or RSG. There were no within or between group differences for 40 yard dash time, vertical jump, or broad jump as a result of training.

Table 3. Results of the training program

Variable	Pretesting x $\pm$ SD	Posttesting x $\pm$ SD	Change
<u>40 yard dash (sec)</u>			
Control group	5.04 $\pm$ .27	5.08 $\pm$ .27	+0.04
Strength shoe group	5.02 $\pm$ .14	4.96 $\pm$ .14	-0.06
Regular shoe group	5.00 $\pm$ .23	4.97 $\pm$ .24	-0.03
<u>Vertical jump (in)</u>			
Control group	23.3 $\pm$ 3.24	22.9 $\pm$ 3.94	-0.4
Strength shoe group	23.6 $\pm$ 2.86	24.0 $\pm$ 2.45	+0.9
Regular shoe group	22.2 $\pm$ 2.46	22.3 $\pm$ 1.93	+0.1
<u>Broad jump (in)</u>			
Control group	97.6 $\pm$ 8.89	97.6 $\pm$ 10.03	+0.0
Strength shoe group	97.6 $\pm$ 4.59	98.5 $\pm$ 5.62	+0.9
Regular shoe group	94.7 $\pm$ 5.38	95.8 $\pm$ 6.08	+1.1
<u>Right calf girth (in)</u>			
Control group	14.3 $\pm$ 1.17	14.4 $\pm$ 1.18	+0.1
Strength shoe group	14.2 $\pm$ 0.94	14.6 $\pm$ 1.15*	+0.4
Regular shoe group	14.1 $\pm$ 1.12	14.3 $\pm$ 1.11	+0.2
<u>Left calf girth (in)</u>			
Control group	14.4 $\pm$ 1.26	14.4 $\pm$ 1.16	+0.0
Strength shoe group	14.1 $\pm$ 0.99	14.4 $\pm$ 1.04*	+0.3
Regular shoe group	14.1 $\pm$ 1.12	14.1 $\pm$ 1.11	+0.1

\* significantly greater than pretesting (p < .05)

### DISCUSSION

The results of this study found that training in Strength Shoes™ resulted in slight increases in performance, but the increases were not significantly greater than training in regular athletic shoes. The SSG had a decrease of 0.06 seconds in 40 yard dash time, which was well short of the company's claim of 0.2 seconds. It was, however, not significantly greater than the 0.03 second reduction seen in the RSG. The improvement in vertical jump also fell well short of the company's claim of a 5-9 inch improvement. The SSG increased 0.9 inches and RSG increased by 0.1 inches. The largest increase in any individual was 2.5 inches in a subject training in Strength Shoes™. The only significant increases in the SSG were for calf girth measurements. The SSG significantly increased their right calf by 0.4 inches and the left calf by 0.3 inches from pretesting values. These increases were not significantly greater than the 0.2 inches and 0.1 inches increases seen for RSG. The company predicted increases of up to 2 inches. These results tend to demonstrate that plyometric type training as used in the present study may slightly increase performance, but the changes are independent of the type of shoe worn by the athletes.

Another study which investigated training in the Strength Shoe™ (5) found results similar to the present

study. Cody found that training in the Strength Shoe™ had no significant effect on vertical jump performance. In that study, six junior varsity collegiate basketball players trained in Strength Shoes™ while six players trained in their own basketball shoes. Both groups trained for 4 weeks. The control group (basketball shoe) increased their vertical jump by 0.10 inches and the Strength Shoe™ group increased by 0.33 inches. Neither increase was significant. Many of the drills included in the training protocol were plyometric in nature (i.e., bounding, hopping, and depth jumps) and were similar to those used in the current study.

Other studies have investigated the effects of plyometrics and weight training on vertical jump and other aspects of sports performance (2, 4, 8). Gemar compared the effects of plyometrics versus weight training on lower leg power. The plyometric group trained 2 sessions per week and the weight training group trained 3 per week, for 8 weeks. Pretest, midtest, and posttest assessments of standing long jump, vertical jump, and 40 meter sprint times were recorded. Gemar found the following changes from pretesting to the posttesting for the weight training, plyometric training, and control groups, respectively: standing long jump = +4.40 inches, +3.74 inches and +0.20 inches; vertical jump = +.91 inches, +.70 inches and +.08 inches; and 40 meter dash = -.21 seconds, -.20 seconds and -.03 seconds. The study found that the gains in the two

treatment groups were significantly greater than the control group, but there was no significant difference between the plyometric or weight training groups. The actual increases in performance were similar to the current study using the Strength Shoes™.

Blattner (4) investigated the effects of isokinetic training versus plyometrics on vertical jump performance. The isokinetic group trained 3 times per week for 8 weeks using the Model 16 BX "leaper" leg press machine. This machine keeps muscular resistance constant during concentric and eccentric muscle contractions. The subjects executed each repetition as rapidly and forcefully as possible for 3 sets of 10 repetitions. The plyometric group trained the same amount of time, but trained using depth jumps. The subjects jumped off boxes 34 inches high down to a mat and then immediately jumped back onto the box. During the 8 week protocol, a weighted vest was worn to add increased resistance, until the total weight added was 20 pounds. The isokinetic group increased vertical jump by 1.9 inches, while the plyometric group increased by 1.8 inches. The results of the study indicate no significant difference between treatment groups.

Bartholomew (2) also studied the effect of plyometrics on vertical jump height. An 8 week training study with 3 groups of subjects was used to determine depth jump effectiveness. Group 1 trained on 50 cm boxes; group 2

trained on 80 cm boxes; and group 3 performed different types of jumps without boxes. Vertical jump increased 4.0 inches in group 1, 3.27 inches in group 2, and 4.57 inches in group 3. It was concluded that depth jumps (plyometrics) do not produce a greater increase in vertical jump ability than doing regular jumping exercises.

Adams et al.(1) compared the effectiveness of three training programs: squats (S), plyometrics (P), and squat-plyometric (S-P) for increasing hip and thigh power production as measured by vertical jump height. All groups trained 2 times per week for 7 weeks. The S group followed a weight training protocol using different sets, repetitions, and percentages of 1RM. The P group followed a protocol using different depth jumps for training, varying in height and duration. The S-P group combined the above described training protocol with slight changes. The S-P group achieved a significantly greater improvement than the S or P groups. The S-P group increased vertical jump height by 4.2 inches, while the S group increased 1.3 inches and the P group increased 1.5 inches.

Wenzel and Perfetto (11) tested the effectiveness of speed training versus weight training for power development. Sixty-five football players participated in an off-season weight training program. All players lifted 3 times per week and used the same program except that 15 players performed a timed hip-sled protocol, while the remaining 40

players performed squats designed for building strength. Different power tests were then performed and no differences could be found between groups on any measure.

Safety concerns of training in the Strength Shoes™ do exist. In the current study, the dropout rate due to injury was more frequent in the SSG than the RSG. Seven of 10 dropouts in the SSG were due to injury, but only 1 of 8 in the RSG were due to injury. As Table 1 shows, the injuries experienced by the SSG ranged from ankle problems to muscle strains of the groin. No single injury was more prevalent. It should be noted that both SSG and RSG experienced calf and leg soreness during training. It was felt that the injuries were due to both the plyometric nature of the training protocol as well as the accelerated rate of progression. RSG could usually continue training with their injuries because they seemed less severe, while subjects in the SSG were forced to drop out due to the severity of the injuries. Again, all subjects were dropped from the study based on advice of a physical therapist.

Based upon the results of the study, feedback from subjects, and previous research, several recommendations regarding the training program are offered. Because of the intensity of the protocol and the high rate of injury, training should be preceded by weight training and a more gradual lead-in to the training program. Yessis (13) recommends that any training program designed to increase

speed, power, or jumping ability should start with a weight training program. By increasing muscle and tendon strength first, the athlete may reduce the chance of injury once the Strength Shoes™ are incorporated into the training program. Also, more gradual introduction of plyometrics is important since every step taken in the Strength Shoes™ is in actuality a plyometric contraction. The current study was preceded by one week of adaptation, however, it was not felt that this time was adequate.

Even though stretching was stressed during the training session, it was felt that subjects need to stretch outside the sessions to remain injury free, especially calf and groin stretches. Flexibility will enhance sport participation by allowing a greater ROM at the joints being used in sport activity. This may also translate into a more efficient and more powerful movement (7).

A third recommendation pertains to the design of the shoe. A shoe with an achilles heel cut-out in the heel may help avoid achilles tendonitis problems. The cut-out would reduce pressure placed directly on the tendon, compared to a full heel, and may reduce irritation of the achilles. Many subjects also felt that arch support in the shoe was inadequate. Finally, a shoe with better overall cushioning may relieve that high impact force which are placed on the feet and ankles. Without cushioning in the shoe, injuries such as shin splints may cause athletes to terminate the

training program.

Upon reviewing the findings and conclusions of this research study, the researcher suggests the following ideas for future research. It has been shown that high school athletes can improve their vertical jump through plyometrics and weight training (10). A Strength Shoe™ study using this population might find more favorable results due to the greater potential for increases found in high school level athletes.

A second study could involve females as subjects. Women need to be trained in speed and power for athletics just as their male counterparts. More studies are needed to determine the training response of females who train in the Strength Shoe™.

Third, different training protocols could be investigated altering intensity, duration, and types of drills, to examine each component in the training protocol and find the most effective means of training.

#### SUMMARY AND CONCLUSIONS

These results indicate that even though there was a tendency for training in Strength Shoes™ to improve performance, the increases were not significantly greater than training in regular athletic shoes. Additionally, the chance of injury appears to be greater when training in the Strength Shoes™.

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APPENDIX A  
PICTURE OF STRENGTH SHOE™



PHOTOGRAPH BY JEFFREY M. HARRIS

APPENDIX B  
INFORMED CONSENT

1997-1998

EFFECTS OF TRAINING IN STRENGTH SHOES ON VERTICAL JUMP, 40  
YARD DASH SPEED, AND STANDING BROAD JUMP

**INFORMED CONSENT**

Your written consent is needed prior to your participation in this training study. Please read this consent document carefully and sign your name in the space provided below.

**PURPOSE:** To evaluate the effects of training in a pair of strength shoes on vertical jump, sprinting speed, and standing broad jump.

**PROCEDURES:** You will be randomized into 1 of 3 groups. Group I will be a control and will not train. Group II will train 3 times per week for 8 weeks wearing the strength shoes. Group III will train 3 times per week for 8 weeks wearing their own athletic shoes. All three groups will pre and posttest. The pretesting will consist of 4 stations: 40 yard dash, vertical jump, standing broad jump, and calf measuring. The 40 yard dash station will be timed from first movement through the end line, with the best trial of 2 being recorded. Vertical jump will be tested on the Vertex using a 2 footed take off, with the best of 2 trials being recorded. The standing broad jump station will consist of the subject using a 2 footed take off to land on the tape, with the longest jump being recorded. At the calf station, the subjects calves will be measured 15 cm. below the joint line and you will also be measured for flexibility using a goniometer. The posttest is identical.

**RISKS OR MEDICAL INJURY:** As with all physical activities, there exists the possibility of injury. These shoes are experimental and the researchers do not know if the shoes cause any type of injury. Potential injury could range from a sprain or strain to a ruptured achilles tendon. If an injury does occur during the study, NO compensation will be provided by the researchers or the University of LaCrosse. To minimize possible injury, the subjects will stretch before and after as part of the workout.

**BENEFITS:** The main reason for this study is to determine the effectiveness of the strength shoe. The information the researcher's gather will be used to evaluate this product. The most important benefit for the subjects is that each subject will receive their own pair of strength shoes with a training program included for participating in the study.

**QUESTIONS AND ANSWERS:** Questions you may have regarding any of the procedures are welcomed and encouraged. If you have any doubts or concerns, PLEASE ask any of the investigators for a further explanation.

**WITHDRAWAL:** You are free to withdrawal consent and discontinue participation at any time you may wish. However, to receive your free pair of strength shoes, the subject must: pretest, train eight weeks, and posttest.

-----  
Investigator's Signature

Date:-----

I ACKNOWLEDGE THAT I HAVE READ AND UNDERSTAND THE INFORMED CONSENT DOCUMENT IN ITS ENTIRELY. I HAVE ALSO BEEN INFORMED AND UNDERSTAND THE FORESEEABLE DISCOMFORTS, RISKS, AND BENEFITS. I, THE UNDERSIGNED, GIVE MY CONSENT FOR PARTICIPATION IN THE STRENGTH SHOE TRAINING STUDY.

Date:-----

Signed:-----

Address:-----  
-----  
-----

Telephone:-----

AMERICAN ASSOCIATION

Jump the Jordan?

APPENDIX C  
ADVERTISEMENT FOR STUDY

**Do YOU want to jump like Jordon ?**

**Do YOU want to run like Lewis ?**

If these qualities interest YOU, then join my research study !!!!

All you must do is train for 8 weeks wearing the STRENGTH SHOE !!



The manufacture claims they will increase vertical jump 9" and knock .2 sec. off your 40 yard dash time.

\* After the study is completed YOU get to KEEP the shoes (\$100 value !!!!)

Help me find out the truth !!

To be qualified for the study, you MUST meet these criteria :

1. Male
2. Age 18-23
3. Can NOT weight train for the legs while in the study
4. Be able to train M-W-F EITHER : 1:10 - 2:05 pm or 7 - 8 pm

First Come - First Served !!! HURRY NOW !!!!!

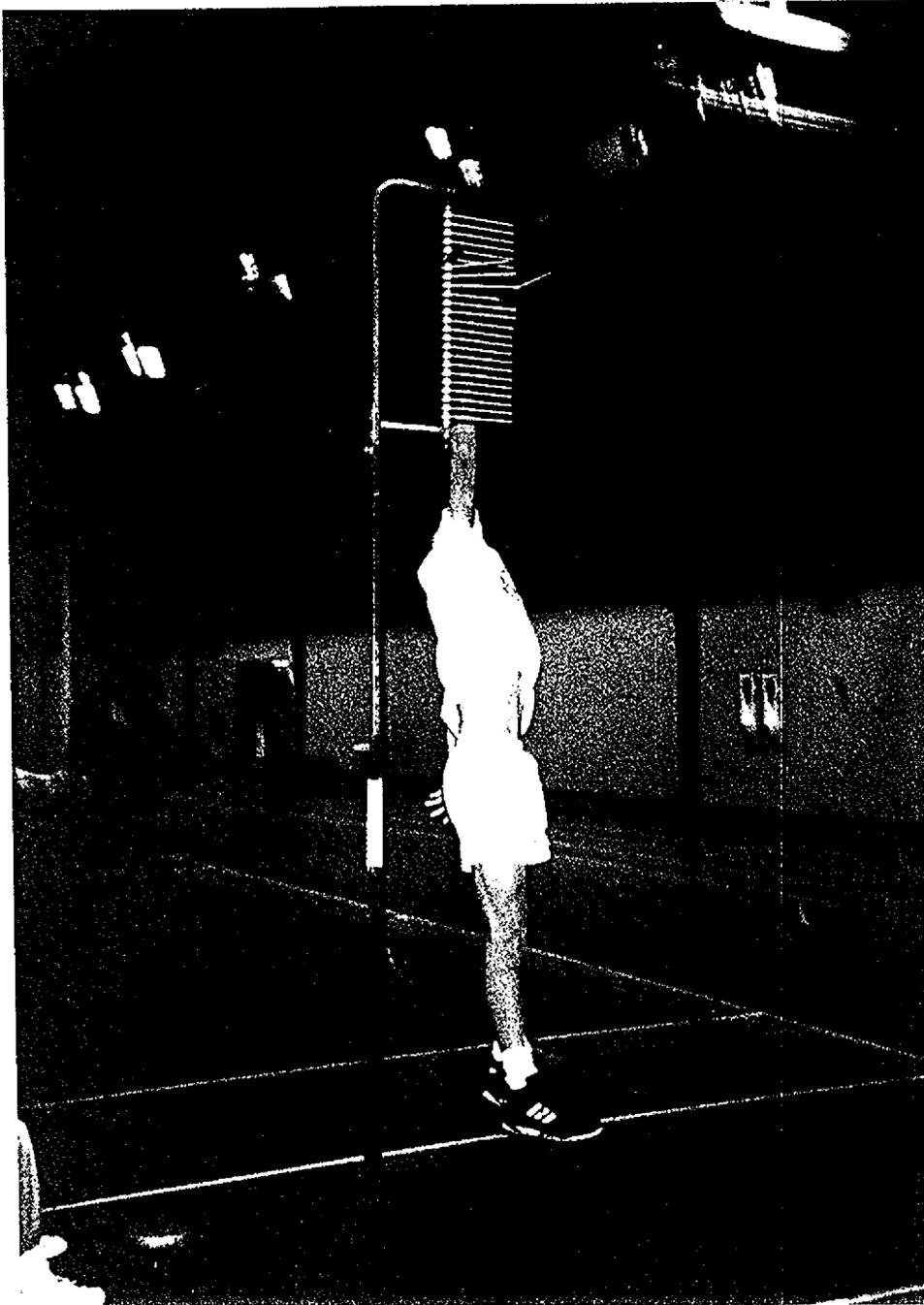
Scott Pethan AFCE  
1305 Main St.  
782-6893

Name:  
Local Address:  
Phone number:  
Shoe size:

Return to  
Intramural  
Office by  
Sept. 14 !

APPENDIX D

PICTURE OF VERTEC MACHINE



APR 20 1974

APPENDIX E  
TRAINING PROTOCOL

APPENDIX E TRAINING PROTOCOL

## BEGINNER III. DRILLS



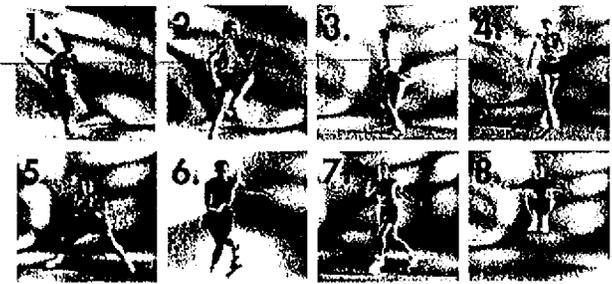
						DISTANCE YD./SEC.	REPETITIONS #S	REST SEC.
PROGRES- SIONS						50 yd.	5	40
HIGH KNEES						25 yd.	3	30
BUTT KICKS						25 yd.	3	30
CRAZY LEGS						15 sec.	3	30
POWER SLIDES						25 yd.	4	30
CARIOCA						25 yd.	4	30
QUICK FEET						15 sec.	3	30
JUMPING						15 sec.	5	30
SPRINTING						50 yd.	5	30

## IV. COOL DOWN for 5 min. with a light jog and stretching.

### III. DRILLS

#### THE ULTIMATE POWER SYSTEM

#### PERFORM 2 OF THE FIRST 8 DRILLS



	DISTANCE YD./SEC.	REST SEC.
1. PROGRESSIONS	50 yd.	40
2. HIGH KNEES	25 yd.	30
3. BUTT KICKS	25 yd.	30
4. CRAZY LEGS	15 sec.	30
5. POWER SLIDES	25 yd.	30
6. CARIOCA	25 yd.	30
7. QUICK FEET	15 sec.	30
8. JUMPING	15 sec.	30

	50 yd.	30
	30 sec.	30
	30 sec.	30
	15 sec.	30
	30 sec.	30
	60 sec.	60
	3	60
	3	60
	3	60
<hr/>		
	9	180
	100 yd.	45
	50 yd.	30
	25 yd.	25

### IV. COOL DOWN for 5 min. with a light jog and stretching.

U.S. PAT. #3,739,500  
CANADIAN PAT. #979641

## ADVANCED III. DRILLS



					DISTANCE yd./sec.	REPETITIONS #S	REST sec.	
PROGRES- SIONS						50 yd.	5	40
HIGH KNEES						25 yd.	3	30
BUTT KICKS						25 yd.	3	30
QUICK FEET						15 sec.	3	30
JUMPING						15 sec.	5	30
BOUND- ING						50 yd.	5	30
JUMPING ROPE						60 sec.	5	60
BOX JUMPS						3 FRONT 3 LEFT 3 RIGHT		60 60 60
						9 TOTAL		180
SPRINTING						100 yd. 50 yd. 25 yd.	5 5 5	45 30 25

## IV. COOL DOWN for 5 min. with a light jog and stretching.



APPENDIX F  
NEWSPAPER ARTICLES

# Big leaps for athletic shoes

OUT OF THE LAB

## UW-L gives new shoes a trial run

The University of Wisconsin-La Crosse is testing strength conditioning shoes that claim to improve jumping and sprinting ability.

The shoes, called strength shoes, are like regular running shoes except for a platform on the front of the shoes that looks like a huge heel.

The platform forces the weight on the front of the feet, supposedly strengthening leg muscles and giving them more flexibility, said John Porcari, executive director of UW-L's La Crosse Exercise and Health Program.

When Kevin Ward, a UW-L strength coach, heard those claims, he asked the company if it would agree to an independent, unbiased study at UW-L.

The company agreed and gave \$8,000 worth of shoes to UW-L for the study — the first of its kind in the nation.

"If the benefits can be documented, I'm going to order a lot of these shoes," Ward said.

"The shoes could accelerate the progress of strength conditioning."

The shoes could benefit athletes in basketball, football, volleyball and track and field, Ward said.

When people walk, 70 percent of the weight is supported by the heels, but with the strength shoes, all the weight is shifted to the balls of the feet, strengthening the



Dick Rinkler of the Tribune staff

**A LIFT:** Strength shoes are designed to improve performance.

Achilles tendons and calves, Porcari said.

Last week, the UW-L study began with 48 college-aged men starting strength drills.

Scott Pethan, a UW-L graduate student and study coordinator, said 24 men will train in the strength shoes, 24 men will train in regular running shoes and another 24 men will do nothing.

During the 10-week study the men will be tested in the 40-yard dash, the standing broad jump and the vertical jump, Pethan said.

Ward said the study will also determine whether this type of vigorous and high level of workout will improve strength without risk of injury.

"We're going to assess the Achilles tendon because people are going to get sore," Porcari said.

The shoes sell for \$110 and are not yet sold at athletic stores, Porcari said.

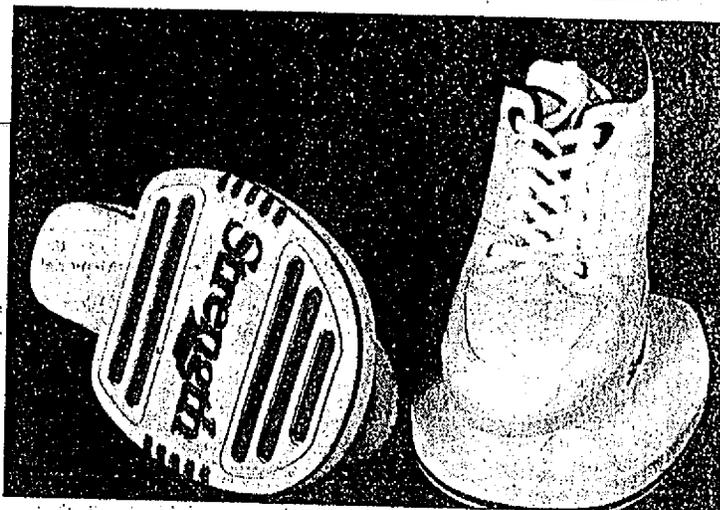
### At a glance

■ **THE PLATFORM** on the front of the shoe forces the weight to the front of the feet to strengthening leg muscles and increase flexibility.

### The promise

■ **STRENGTH FOOTWEAR** claims the shoes will increase vertical jump 5 to 9 inches, cut 40-yard dash time up to 0.2 of a second and increase leg calves up to 2 inches.

By TERRY RINDELEISCH / of the Tribune staff



Dick Flinker of the Tribune staff

The design of these special training shoes is intended to enhance leg strength.

## UW-L shoe test: 'No significant changes'

By TERRY RINDFLEISCH  
Of the Tribune staff

Strength Footwear claimed that its strength conditioning shoes would increase vertical jump 5 to 9 inches, cut 40-yard dash time by two-tenths of a second, and increase leg calves by 2 inches.

Not in your wildest dreams, according to a University of Wisconsin-La Crosse study.

Kevin Ward, a UW-L strength coach, said he is not ordering any strength shoes yet for his athletes.

"There were no significant changes in the strength shoe group," Ward said.

"The shoes still have potential, and we plan to do another study this summer."

The study showed:

- In the vertical jump, the strength shoe group jumped four-tenths of an inch higher after a 10-week training program. After the same training, the regular running shoe group jumped one-tenth of an inch better.

The biggest improvement in the vertical jump was 2 inches, said John Porcari, executive director of UW-L's La Crosse Exercise and Health Program.

- In the 40-yard dash, the strength shoe group decreased its time by six-hundredths of a second compared to three-hundredths of a second by the regular running shoe group.

“The shoes have potential, but we’ll never see the changes the company talked about.”

— John Porcari, UW-L

- The calf muscles on people wearing strength shoes increased by about a half-inch, Porcari said.

"The shoes have potential, but we'll never see the changes the company talked about," said Porcari.

Seven people dropped out of the strength shoe group due to injuries, he said. One person dropped out of the regular shoe group due to an injury.

Strength Footwear gave \$8,000 worth of strength shoes to UW-L for the study, the first of its kind in the nation. The strength shoes are like regular running shoes except for a platform on the front of the shoes that looks like a huge heel.

The company claims the platform forces the weight on the front of the foot, supposedly strengthening leg muscles and giving them more flexibility, Porcari said.