
Are There Any Differences?



Teaching The Women's Hammer

We welcome Larry Judge back to these pages. During the 1999 indoor season, his pupils were outstanding: Dawn Ellerbe threw 22.94 in the weight, an American record, and Kevin Mannon bagged a 22.76 collegiate record. Not only can Judge coach, but he writes with clarity about the event. This article is timely, as it summarizes some very important points on the coaching of in the hammer. His presentation on the hammer at the November, 1998, Level III school to a group which included hammer notables Harold Connolly and Boris Zaitchuk was very well received.

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GENDER EQUITY

Gender equity is a term that evolved from Title IX and has athletic directors scrambling to improve opportunities for women across the board. Gender equity has definitely affected the sport of track and field. Historically, events such as the hammer, pole vault, and steeplechase have been thought to be for men only.

At the 1999 World Championships, the hammer will be contested by both men and women. This is due to the gradual emergence of the

women's hammer over the last ten years. In 1996, the NCAA Division I Championships added the hammer throw for women. This was a giant step in the emergence of the event, not only for women but also for men.

Bringing the hammer throw into the national championships has allowed more opportunities for women to compete. Subsequently, most major conference championships have now included the event. This has led more universities to build throwing facilities and invest money into the hammer. Field event coaches have been forced to learn more about the event.

The university system is the key to track and field development in this country. Ultimately, more schools will have to hire or train competent coaches and build adequate and safe training facilities. Because of the growth of the women's hammer, coaches must teach the event not only to men but to women. Some of the universities that added the event for women may now offer the same opportunity that in the past was not available for men. This is a win-win situation for everyone involved.

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TEACHING THE HAMMER TO WOMEN: IS THERE REALLY ANY DIFFERENCE?

The teaching progression for the event is the same for men and women. According to a recent study by Romanov and Vrublevsky (1998), women throwers follow a rhythmic throwing structure that follows in many aspects the technique followed by men.

Teaching the winds, practicing the turning pattern, and drilling the release are all things a beginning thrower must do, regardless of gender. Because the women use the same implement (4k) at all levels, it is possible to use the competition weight for teaching purposes. When teaching a collegiate male it is advisable to start with a 12-or 14-pound ball.

When teaching women, the emphasis should be on drills and repetition as this will help establish the proper technical pattern. They are typically not as concerned about distance immediately. Because of the weight of the implement, most women throwers will be able to rely on speed and technique to make the implement go. The first month of training should be spent on drills. Proper execution of drills will ensure later success.

The differences in the amount of muscle mass, the distribution of muscle, and the testosterone level of women when compared to men of similar age, total body mass, and training state, may result in different workouts for male and female athletes.

Women's mean total body strength is 63.5% of men's total body strength, according to Laubach (1976). According to Wright (1980), men have ten times the testosterone levels of women. Researchers have examined the role of body size in the strength differences between men and women.

According to Wilmore, (1974), when body size is accounted for, women are weaker in upper body

strength than are men. Men proved to be 63% stronger in the bench press than women. A recent study by Hoffman, et al., using isokinetic testing found men to be 50% stronger in absolute terms when adjusted for height and lean body mass. Though women may be weaker than men, keep in mind the 4k hammer may not be as physically demanding as the 16lb is for their male counterparts.

As a result of their flexibility in the upper body and natural tendency to be proportionally stronger in the lower body, women may be better suited for the event than men. The hammer thrower must possess core strength as well as lower body strength and power. Most hammer throwers avoid a lot of upper body work like the bench press because it tightens up the chest and shoulders.

In my experience, women often pick up the basic technique of the event quicker than men probably because they tend to be a little more technically oriented. With their upper body flexibility, they tend not to muscle the implement; they let the movement happen.

Men have a tendency to drag the ball because it feels heavy and they try to overpower the hammer with the upper body. Women often have an easier time learning the event because of their stature and the fact that the implement weighs only 4 kilos and the weight does not change from high school to college.

Improving strength in the lower body is usually not a problem for women. However, most females must also work hard to improve their pull strength doing cleans, snatches, jerks, and high pulls. They must also pay special attention to improving their core strength or torso power. This is very specific to hammer throwing and most female hammer throwers can benefit from torso exercises in the weight room in addition to the medicine ball and kettle bell throws.

The biggest difference between training men and women may be found when designing the workout during

the competitive season. Because of differences in hormone levels women cannot back off as early as men when peaking.

DESCRIPTION OF TECHNIQUE

This description of the hammer throw is based on a three-turn throw. This style of throwing was chosen because it is a common style used by the typical intermediate level collegiate thrower.

It must be kept in mind, however, that a four-turn technique has been successfully employed by advanced throwers and ultimately may be advantageous for women because of their smaller feet. It must also be remembered that many throwers use different types of starts.

The throw has seven parts:

1. The Grip and Starting Position
2. The Winds
3. The First Turn
4. The Second Turn
5. The Third Turn
6. The Release

STARTING POSITION

THE GRIP

A right-handed thrower should grip the handle in the left hand at the mid-part of the fingers (glove hand). Then place the right hand over the left and cross the thumbs with the left thumb on top; or if more comfortable, the thumbs can be side by side rather than overlap. There is no exact focal point, but the thrower should look into the horizon and slightly to the right and back (toward the rear of the circle).

THE START

The start includes the winds and the preliminary movements preceding the winds. The key to consistent throwing, the start sets up the posture and

the timing of the throw. It is one of the areas that can vary among throwers. The start should best suit the individual thrower to put her in the best position to enter the transition phase and ultimately accelerate the hammer. There are three major start types.

1. The Static Start

Before performing the wind, the thrower must first decide where to place the hammer in the ring. For a beginner it is recommended to place the implement about three feet behind the right foot for a right-handed thrower. This is commonly referred to as the static start. This is a no-nonsense way to start the throw because there are very few preliminary movements and it is very easy to teach.

- The athlete stands at the rear of the circle, her back facing the direction of the throw.
- The athlete's base should be shoulder width in order to have a comfortable and balanced starting position.
- The athlete's head should be up, shoulders should be level, and eyes focused outside the ring slightly to the right.

(The reason for looking to the right is to catch the hammer early in front of the thrower to create a more balanced system to alleviate the problem of dragging the ball.)

Important Points

- Look at or behind the ball when it is in front of you.
- Lock down the hammer on the first wind eighty degrees to your torso.
- Move as the system (hammer, knees, hips, hand, head) moves, simultaneously aligned with one another.
- Keep an erect torso with a slight bend in the legs.
- Extend relaxed arms to extend the radius.

2. The Pendulum Start

In the hammer, the intermediate-

to-advanced thrower could perform a preliminary movement with the hammer to create momentum for the winds. This pendulum movement can vary according to the athlete's preference. A suggested preliminary movement is to set the hammer next to the left leg and swing the hammer from the left hip to the front as the athlete begins to wind. Another option is to start the hammer in front of the athlete between the legs. Basically, the pendulum gets the ball moving prior to the wind.

3. The Dynamic or Step-in Start

In this start, the athlete starts with the left foot staggered approximately one foot behind the right. The leg remains staggered during the first wind and the athlete will step in to the parallel position following the second wind. This type of start is often chosen because it helps the thrower establish rhythm in the start.

PERFORMING THE WINDS

There are usually two winds, or complete revolutions of the hammer head, before the turns begin. The winds must be performed with the same rhythm as employed in all the turns of the throw. Since the position of the low point is so crucial, the winds play a key role in the success of the throw. The winds could be thought of as standing turns.

One of the important concepts to keep in mind during the winds is opposition. As the hammer is gradually accelerated through these two revolutions, the thrower's center of mass is shifted in the opposite direction from the hammer in order to maintain balance between thrower and hammer.

The opposition of the thrower's body weight and the hammer is what generates force in the winds. On the winds the low point is at the center or slightly to the right of center on the first wind. During the second wind, the body movements are more exag-

gerated than during the first because of the increase in the hammer's velocity and, thus there is an increase in the centripetal and centrifugal forces. The right foot must be straight, never being allowed to open so that the hip axis remains square across the front while the shoulder axis turns right to pick up the hammer at its apex.

Throughout the winds the angle of the hammer's upward path increases slightly, with the low point of the swing slightly left of center as she faces the back of the circle. The second wind should be faster than the first as it sets the rhythm for the turn.

Because of the mass of the implement many athletes have trouble starting the throw. The wind often causes many problems if the athlete is off balance. The left shoulder is the axis of the winds. Although body weight is moving opposite the hammer, keeping the winds moving around the left shoulder is important because the shoulder needs to be kept low on the entrance. An off-balance start will take energy away from the turns and will lead to a weak finish. A poor start can lead to problems in the first turn.

TEACHING THE WINDS

Preliminary swings are performed to get the implement moving as the athlete enters the first turn. In teaching the winds it is best to use a 3k medicine ball on a rope. A way to cue the teaching of the winds is "Sweep, Curl, Form the Window, Comb the Hair, and Twist." The thrower sweeps the ball to the front of the body, curls her left arm when the ball passes her body, lets the handle pass over the midline of the head, and then twists the shoulders to catch the ball behind her. The shoulders rotate to bring the ball forward and then turn back to meet the hammer as it moves to the thrower's right.

At that point, the hands should be kept above the shoulders. When the athlete curls the left arm after the sweep she actually forms a window in

front of her prior to the twist of the shoulders.

The thrower should not let the hands pass beyond the midline of the body and should not try to reach back over the head past the middle of the head.

The winds must be symmetrical with almost equal forces occurring to the left and the right. For this to happen the thrower must think of “pushing” with the right arm and not pulling with the left as the implement moves to the thrower’s right. The athlete should be able to perform the winds empty-handed, emphasizing the sweep, curl, form the window, comb the hair, and twist, and lifting the heels at the proper time.

Have the athlete perform multiple winds with a medicine ball on a rope in order to feel the smooth sweeping motion. After the athlete has mastered the medicine ball on a rope, try the hammer. Sets of 5 to 10 consecutive winds really helps in teaching rhythm.

- The feet are parallel and slightly wider than shoulder width apart, and the toes are one inch in from the edge of the circle.
- The knees are bent at an angle of approximately 150 degrees.
- The feet are parallel to help create a blocking action on the wind.
- Block the right leg at the back of the circle in a good solid squat position with the torso erect.
- Keep your eyes on your focal point, which is slightly to the right to catch the ball in front of you. It is crucial to keep the head in a fixed position because a common fault is to lead with the head and brake the system on the first turn by leading left with the head or left knee.
- The athlete straightens his back and draws the left arm forward and upward with a smooth lifting movement. Cue: Sweep.
- At the same time, the upper body is twisted to the left, beginning the wind.
- The arms sweep the hammer in a wide flat path. A flat path is impor-

tant for control in the first turn.

When the ball is left-front, the thrower should:

- Bend the elbows. Cue: Curl and Form the Window.
- Lower the left shoulder.
- Move the hips to the right.
- Pass the hands over the midline of the head. Cue: Comb the hair. Turn the right shoulder and do not let the hands drop below the shoulders. Cue: Twist.

THE TRANSITION PHASE

The transition into the initial turn, wherein the body becomes a rotating axis for the hammer, begins as the hammer descends after the second wind. The transition to the first turn is one of the most difficult elements of the hammer throw. The incorrect execution of this phase reduces the effectiveness of the turns and throws off the whole throwing rhythm.

During the last wind when the hammer has passed through the high point the hands stay above the shoulder and the thrower lowers her center of gravity. As soon as the hammer reaches its low point at the completion of the second wind, the right-handed thrower should let the hammer get past the left leg before starting the turn. This is commonly referred to as letting the ball run or “using the ball.”

At this point, most of the weight should be on the right leg as the thrower starts to turn by pivoting on the heel of her left foot and pushing on the ball of her right foot.

During the transition to the turns the body mass is kept in a central position so that the right leg does not move in an “unloaded way.” During the turns, the hammer and thrower rotate around an axis, which passes through their common center of mass.

Posture and core control are very important in the transition phase. A common problem in the transition phase is breaking at the waist follow-

ing the wind. As the body mass moves forward, so does the system center of gravity, moving ground contact center of pressure toward the front foot. This makes it difficult to lift the ball of the foot and begin the turn.

For this position to be effective, the forward trunk lean must be countered by a backward motion of the hips. This position should be avoided by everyone except extremely advanced throwers as it often causes the athlete to stand up into the first turn.

Important points following the winds: There is a definite increase in tempo as you start the first turn, and the tempo increases with each subsequent turn. At the end of the second wind the weight should be on the left foot until the ball reaches approximately 90 degrees. As the thrower moves the hammer head forcefully to the left the weight shifts to the heel of the left foot as the right leg is lifted.

Key Points

- At the high point of the second wind, the athlete starts to bend the knees in preparation to enter the first turn.
- As the hammer comes off the second wind, the shoulders are level and the trapezius and latissimus muscles are locked down.
- The lower back is straight, and the shoulders are relaxed and arms are extended.
- The athlete starts turning on the left leg when the ball is past zero or left-front to the athlete.
- Simultaneously (to maintain the system), the right leg starts, and the thrower turns on the left heel and the ball of the right foot.
- When the hammer is at zero to 90 degrees, the body weight is over the right foot, and the left leg is working against the centrifugal force of the hammer.
- Enter the first turn with a moderately flat orbit keeping everything in line maintaining a 90-degree angle between the arms and torso.
- The athlete turns the left foot to approximately 160 degrees in the first

phase of the turn, continues on the outer side of the foot, and completes the rest of the full 360-degree turn on the ball of the foot.

- The thrower should then pump the right knee up over the left leg by lifting it at 80 degrees.

THE TURNS

The number of turns must be fixed for each thrower according to the degree of her ability and her individual level of speed and strength. This is usually two turns for the beginner and three or four turns for the intermediate or advanced thrower. A female hammer thrower can easily perform four heel turns in most cases. This makes the four-turn technique more attractive for the female thrower. Many female throwers could conceivably perform a toe turn followed by four heel turns and easily stay in the ring.

The turns consist of single-support and double-support phases. During the single-support phase the athlete tries to keep the hammer system in line. The double-support phase is when the thrower actively acts upon the implement.

During the first turn the trunk is erect and the left leg is locked. The thrower tries to utilize inertial forces of the hammer in the single-support phase by riding the ball and being passive with the ascending hammer while also avoiding activity with the pelvis and legs.

After running through the high point of the hammer, the completion of the turn on the ball of the left foot should be done actively to drive back to double support as soon as possible. Both of the feet should be parallel, with the right leg slightly behind the left at between 225 and 270 degrees at the completion of the turns. This is a key technical point as most throwers do not actively finish the turn with the left leg. This makes the acceleration phase difficult and causes the athlete to fall off the axis.

The key to the “first turn” is to

keep it in line with the whole “Hammer System.” The feet, knees, hips, torso, arms, and head all must move together in sync. The “first turn” of the hammer throw allows the thrower to accelerate the hammer in a more gradual and fluent motion.

Common faults to identify in many throwers are dragging the ball, breaking the system, and catching the hammer with the wide base when the right leg sweeps around the left. If the first turn is properly executed, the thrower should catch the ball at approximately 225 degrees. The ball should be lined up with an erect torso and head with legs bent on the ball of the right foot. The hips will be slightly in front of the hammer system. The hips will be facing 270 degrees while the shoulder axis will be at approximately 225 degrees.

TEACHING THE TURNS

The turns are the most important component in teaching hammer technique. The turn is taught in two steps to make it as easy as possible for the athlete to understand.

Step number one: Have the athlete start with the feet shoulder width apart, the knees slightly flexed and the head up. The arms will be straight and will be held together in front of the athlete. Have the athlete put her body weight on the ball of the right foot and the left heel. Have the athlete turn until she reaches 180 degrees. Have the athlete repeat these 180-degree rotations. When the athlete can get to this position have the athlete turn and walk in the opposite direction. This helps teach the idea of lifting the right foot to complete the turn.

Step number two: Instead of having the athlete turn and walk, they must now learn how to complete the turn. Have the athlete put her body weight on the ball of the right foot and the left heel. Have the athlete turn until she reaches approximately 90 degrees. At this point, the athlete picks up the right foot and continues

to rotate on the side of the left foot to the ball of the foot. The right leg is kept close to the left as the athlete completes the turn on the left leg and prepares to place the right foot at 270 degrees.

It is important that on completion of the turn the right leg make contact through the ball of the foot. The athlete must practice performing a single turn over and over until it feels comfortable.

At this point the athlete can add a second consecutive turn and then a third. It is important for an athlete to be able to perform three dry-run turns before having the athlete turn with an object.

After the thrower has mastered the elementary turning action, it is time to turn with a medicine ball on a rope and then eventually with a hammer.

THE WORK PHASE

When the right foot is grounded at the completion of each turn, the thrower is in position to greatly accelerate the hammer. The work phase can be thought of in two parts 270 to 0 degrees and 0 degrees to 90 degrees.

The feet are slightly ahead of the hammer while it is on its downward path, creating an ideal situation for increasing the hammer’s velocity. Ideally the thrower should try to drop the left knee and set the right foot in at 270 degrees.

The quick right foot contact using the rotating right foot, initiates the hips and torso to serve as the mechanism to push the ball out and around the front of the body to zero. When the two feet are on the ground the right foot is rotating as the upper body is countering back in the direction of throw. The thrower should be attempting to lengthen the distance between the back of his head and the bottom of the implement.

The acceleration phase can only be done when the thrower has both feet on the ground. Therefore, it is advantageous to ground the right foot quickly. Double support in the work

phase needs to be as long as possible giving the thrower more time to accelerate the hammer. This is accomplished with a passive upper body.

The second part of the work phase continues to about 90 degrees. The athlete should let the ball run past the left leg by pushing with the right until the leg is lifted entering single support. There will be a whipping type of action with the ball. Continuing to work the ball from zero to 90 degrees keeps the ball from slowing down.

Key Points

- The beginning to intermediate thrower should keep the first work phase under control and not try to create too much orbit.
- Do not raise the shoulders or arms to create orbit.
- Concentrate on working the hammer around and away from the body during the double-support phase. Working the up strokes, during the single-support phase, will cause the athlete to stand up.
- Elite throwers have been observed to work the hammer from 270 to 90 degrees.
- When the athlete catches the hammer, the violent counteraction occurs and the thrower accelerates the ball to zero by countering against the hard heel.
- The lower body (hips and legs) must move faster and faster by pushing away from the hammer with a hard left heel grinding the right foot against the ground.

THE RELEASE

If the three or four turns have been executed correctly, the speed and orbit of the implement has increased on a smooth path of acceleration from turn to turn. The athlete should think of entering another turn and block the legs at 90 degrees. The final acceleration comes from the extension of the knees, hips, back and shoulders. The release should be thought of as going around the body and the athlete should

push with the right leg.

Therefore, in the beginning of the last turn, the thrower must concentrate on this last effort:

- Just as the right foot hits the ground, she starts a final explosive counter and pull.
- She extends the whole body and throws the head backward.
- The hammer is propelled upward and over the left shoulder with the arms straight.

The close grip snatch is the best lift for specific release power development. The ultimate angle release is 42 degrees. At that angle an 80-meter throw has ball speed of 60 miles per hour.

COACHING THE WOMEN'S HAMMER: ESTABLISH THE MODEL

The difference between training men and women in the hammer throw may not be significant. But, as a coach, it is important to recognize the subtle variations. The male athlete must possess a large amount of strength to counter the high forces required to be successful in the hammer. These higher forces require lower depth and exaggerated positions.

The women's implement is much lighter than the men's and accordingly this may be more of a speed event for women. The low depth in the catch that is modeled by many of the male throwers may not be necessary in the women's event. A model that is specific to the female thrower needs to be established.

The coach must establish the position of strength for the athlete in the hammer. This may differ greatly or only slightly from athlete to athlete. This will depend on the physical characteristics of the athlete as well as how quickly the athlete catches on to the technique, as in the hammer throw. Since the beginning female thrower may not be as familiar with the weight room as a male athlete, you

may have to put her in the position of a 1/2 squat to demonstrate the amount of knee bend necessary to throw.

But the solution does not rest in copying the technique of a current champion hammer thrower. The technique used by a champion may be far from the technique needed for a beginning or intermediate female hammer thrower. If a beginner tries to copy the technique of an elite hammer thrower, she will become frustrated and lose interest in the event.

The positions achieved by an 80-meter hammer thrower are not necessary for a beginner to intermediate thrower. The whole idea behind throwing the hammer during the competitive season is to get results. Establish a realistic model and an approach to training that will bring results. At first this may be a one- or two-turn throw.

KEEP IT SIMPLE

To achieve success in the hammer throw you must maximize the capabilities of the athletes you are coaching. This means you must create a model that will bring results. Teach the grip and the wind. Start your athlete with a wind and release first. After the athlete masters the wind and release, introduce the one turn and release. Then advance to the two-turn throw. For many beginners this may bring more distance than the three-turn throw. If this is the case have the athlete use the two turns in competitive situations until she has mastered three turns in practice. As an athlete masters two turns she may be tempted to try three.

It is okay to experiment with the three-turn and perform multi-turn workouts in practice. However, most athletes will not have the strength or technical efficiency to get increased distance from an extra turn in competition. Athletes will tend to decrease speed on the last turn and will actually lose distance on their throw. If this is the case, become proficient with two turns and stick with it.

CONCLUSION

A coach must set the model for each athlete. All athletes have a model that will work for them. This model must be specific to the physical attributes of each athlete. The coach must choose which technique best fits the athlete with whom he is working.

In teaching technique to beginners, special attention should be paid to the development of the “right reflexes,” as technique can only be mastered if

muscle contractions can be coordinated and synchronized to produce maximum total effort relative to hammer throwing. It is required that athletes concentrate on the correct movements.

During the initial stage, the athlete should not be “distance conscious” and should be conditioned to concentrate on the development of the proper movements in order to establish the necessary reflexes.

The women’s hammer is a wide open event. The opportunities are endless for a talented young thrower.

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TABLE I: Women’s Hammer Training

Sample workout #1 Beginner/Collegiate Women		
Order of Drills	Wt.	# reps
Walking winds 2x each way		
1 wind 1 turn drill		(5)
Turns (sets of 5)	4k	(6)
Wind and release	4k	(3)
1 turn and release	4k	(5)
2 turn and release	4k	(5)
2 turn and release	3k	(8)

Sample workout #1 Intermediate/Advanced thrower— Collegiate Women		
Order of Drills	Wt.	# reps
Walking winds 2x each way		
Left arm drill	10 lb.	(5)
Right arm drill	10 lb.	(5)
Turns (sets of 5)	10 lb.	(6)
4 turn accelerations	10 lb.	(8)
3 turn and release	10 lb.	(8)
3 turn and release	4k	(15)

TABLE II: Women’s Hammer Training

Sample workout #1 Building speed/Coll. Women		
Order of Drills	Wt.	# reps
Walking winds 2x each way		
1 wind 1 turn drill (5)		
Turns (sets of 5)	4k	(6)
Wind and release	4k	(3)
1 turn and release	4k	(5)
2 turn and release	4k	(5)
2 turn and release	3k	(8)

Sample workout #1 Intermediate/Advanced thrower (Building power)—Women		
Order of Drills	Wt.	# reps
Turns (sets of 5)	10 lb. hammer	(5)
4 turn accelerations	10 lb. hammer	(8)
3 turn and release	16 lb. Wt.	(8)
3 turn and release	20 lb. Wt.	(15)