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Editorial Board

Peter Lawler, Jörg Prost,
Glynis Nunn-Cearns

Correspondence & Contributions

Glynis Nunn-Cearns
Executive Director
ATFCA
PO Box 430
Ashmore City QLD 4214

Email: enquiries@atfca.com.au
Phone: +61 7 5597 4499

Subscriptions

ATFCA
PO Box 430
Ashmore City QLD 4214
Australia

Email: enquiries@atfca.com.au

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Simplifying Bondarchuk



Understanding the Principles Behind one of the World's Top Throws Coaches

G. Martin Bingisser

G. Martin Bingisser is the Swiss national hammer throw champion and trains under the guidance of coach Anatoli Bondarchuk. In addition, he serves as President of the Evergreen Athletic Fund, a non-profit organization that runs several hammer throw websites. He writes about training with Bondarchuk on his website: <http://www.mbingisser.com/>.

In the small world of throwing, perhaps no one's reputation is greater than that of Anatoli Bondarchuk. The converted discus thrower didn't pick up the hammer until his mid-twenties, but nevertheless developed into a world-class athlete and claimed the gold medal at the 1972 Olympics. From there Bondarchuk went on to win another Olympic medal, and then found even more success as a coach. During his 16 years as Soviet national throws coach, Bondarchuk coached numerous world and Olympic champions in the hammer throw, shot put and discus. His athletes, including his most notable protégé Yuri Sedykh, won over a dozen Olympic medals and broke 12 world records. Bondarchuk's ideas on training have also influenced others and spawned a new generation of athletes. Reigning Olympic and world hammer throw champion Primož Kozmus trained using Bondarchuk's methodology.



Restating Bondarchuk's resume could fill an article of its own, and many people are already familiar with his career highlights. However, people are less familiar with what made his athletes so successful. While Bondarchuk has written extensively about his training methodology, few good articles have been published in English and even fewer have had the benefit of a clear translator, leaving many readers confused. I certainly had that feeling after first reading his articles several years ago. At the time, a friend even told me this confusion was Bondarchuk's way of hiding the Russian training "secrets."

After training with Bondarchuk for several years, I can assure you that nothing is further from the truth. Bondarchuk is not trying to hide any "secret." The truth is, there is no secret. Bondarchuk's success stems from simple training principles refined over years of experience. In addition, he is more open than any coach I've met, willing to share information

with anyone that asks. The lessons I learn from him are straightforward, intuitive, and applicable to all the throwing events. Below are ten lessons I've learned from training under the guidance of Bondarchuk and from reading his articles and books.

Lesson 1: Science is your friend

Bondarchuk's success starts with science. Bondarchuk was not only an athlete and coach, but also a scientist. While an athlete, he received a doctorate of Pedagogical Science degree from the University of Kiev. His training theories developed not just from trial and error, but from the results of studies, tests, and data compiled from several thousand athletes of all ages and from a variety of sports. Bondarchuk's position as the Soviet national throwing coach granted him access to nearly every athlete in the country and thus gave him a gold mine of information he used to revolutionize training for the hammer throw and other events. While many coaches only have access to their own athletes' data, Bondarchuk was able to mine the data of athletes in all sports to determine which training methods were ideal. He also kept an open book on his findings, willingly sharing them with the world as one of the most prolific writers in the throwing world. So far, Bondarchuk has published over 200 articles and a dozen books. The Australian Track and Field Coaches Association even published his first English book entitled Long Term Training for Throwers. Recently, he has published two more English books about periodization and general sports training methods with Ultimate Athlete Concepts in America.

Additionally, Bondarchuk doesn't let his success so far hamper future innovation and he still strives to improve upon his theories. He will reach his 70th birthday in May and continues to collect data, learn, and refine his conclusions daily. He surprises his current training group every year by giving someone a new exercise or workout program that no one in the training group has done before.

Whether a coach agrees with Bondarchuk's conclusions or not, they should at least agree that proper data collection is essential to success. Without data, a coach cannot truly

know whether their methods are working. It is imperative that coaches maintain detailed daily records of every exercise the athlete performs, the volume and intensity of each workout, and the athlete's best daily throwing performances. Elements outside of training should also be recorded, such as how well an athlete is sleeping and their energy or motivation levels.

Lesson 2: Athletes have limited time and energy

Coaches have literally thousands of exercises to choose from when developing a training program. Athletes, however, have a finite amount of time and energy. Therefore, coaches must prioritise. It may be best for a coach to consider choice of exercises like investment choices. Rather than money, the coach is investing another finite item: the athlete's time and energy. Coaches should look for the best exercises, ie those that produce the best return on investment.

For example, Bondarchuk's hammer throwers never do push ups. While doing push ups may not directly hurt a hammer thrower's performance, the exercise only serves to make the athlete more tired without improving results. In such a situation, it is always better for the athlete to do an exercise with a higher rate of return, such as throwing the hammer or doing power cleans. It may also be ideal for the thrower to rest instead of doing an exercise. More training is not always better, and athletes need adequate rest in order to prevent overtraining and to keep their motivation levels high.

Lesson 3: General strength often isn't the answer

For Bondarchuk, the best investment is the most obvious one: athletes should prioritize exercises that are closest to the competitive movement. Bondarchuk looks for what he calls "transfer of training." This is where improved results in one exercise lead to an improvement in another exercise. Throughout his studies, Bondarchuk has determined that there is a higher transfer of training between exercises that mimic each other in form. While this is intuitive, coaches often overlook this because the weight room seems to offer a get rich quick scheme.

Just as in the financial world, there is a difference between short-term investments and long-term investments. Strength training is a great short-term investment. If a young athlete adds strength, their results will quickly improve. However, over the long term, the results plateau. Bondarchuk's research has compared two groups of athletes: one group focused on lifting heavy and the other focused more on throwing-specific exercises. While the first group made faster progress in the beginning, the second group inevitably surpassed the first group after about four years. In other words, lifting will

only take you so far. After a certain level, there is a point of diminishing returns to this approach.

Bondarchuk's statistical models also reach same conclusions. After years of monitoring thousands of athletes, Bondarchuk has closely tracked results for a variety of exercises in order to correlate any relationships between them. The conclusions are stunning. For instance, in the men's discus throw, Bondarchuk finds that only the bench press bears a statistically significant correlation to results after 55 metres. After 60 metres, no weight room exercises have a strong correlation to results. Similarly, in the hammer throw, the correlations with weight room exercises are insignificant for men past 70 metres. While the correlations are higher for female throwers, they are still shockingly low overall.

Lesson 4: Special strength often is the answer

Among the throwing events, special strength is essential. For example, the best long-term investments in the hammer throw are throwing hammers and doing special strength exercises such as twisting. Similarly, in the discus the best long-term investments are throwing the shot put and doing pushing movements. As Bondarchuk puts it: "We should pay attention to those muscles which are stretched out at the time of the main movement's performance." These exercises develop the specific or "special strength" required to throw far by developing the majority of muscles used in the throw.

Unlike weight room exercises, throwing different weight implements has a significant correlation with throwing the competition implement for all levels of throwers. As mentioned above, there is little correlation between weight room exercises and results for an 80 metre hammer thrower. The correlation between the squat and the hammer throw at that level is 0.196. In other words, among 80 metre hammer throwers, it is impossible to predict who will be the best among them based on how much each thrower squats. However, the correlation between the 10kg hammer and the competition hammer is 0.824. A perfect correlation is 1.0. Furthermore, what makes up a good lifting program does not necessarily make up a good throwing program, and Bondarchuk has found it necessary to put more focus on those exercises with a high correlation to results even if it means less time spent working on general strength.

Table 1: While weight room exercises have a good correlation with results for beginning hammer throwers, that correlation is lost at elite levels. Only special strength exercises maintain a significant correlation past 70 metres. Below is a sample of some correlations Bondarchuk has compiled. A 1.0 is a perfect correlation between an exercise and results with the competition 7.26-kilogram hammer.

Table 1

	5kg HT	6kg HT	8kg HT	9kg HT	10kg HT	Clean	Snatch	Squat	Vertical Jump	LJ
60-65m	0.824	0.786	0.869	0.675	0.542	0.421	0.451	0.437	0.360	0.397
75-80m	0.564	0.664	0.798	0.765	0.824	0.270	0.245	0.196	0.124	0.127

Lesson 6: Pay attention to individuality

Simply put, all athletes are not the same. What is the best investment for one athlete isn't the best for another. L.P. Mateyev has shown that athletes adapt to training stimuli in one of three general ways. For example, when presented with a new training program, some athletes will slowly see their results decrease until the body begins to adapt and a new peak is reached. Other athletes will see their results climb immediately. While Bondarchuk finds this important, it is not the most important factor. What is key for Bondarchuk is simply recognizing that each athlete is different and finding a type of system that best fits that athlete.

Finding the correct system for each athlete is not easy. There is no cookie-cutter approach to this. A coach must observe his athletes and learn from them before an ideal model can be produced. This may take a year or more, but it is worth it in the long run because the coach will have a better understanding of the athlete's individual physiology.

In addition, each athlete has different strengths and weaknesses. For example, Bondarchuk began to coach Dylan Armstrong in 2005 as Armstrong was switching events from the hammer throw to the shot put. At the time, Armstrong had great general strength, but little special strength and technique since he had taken relatively few throws with the shot put. To address this, Armstrong's training focused 70% on technique, 30% on special strength, and none on general strength. With weaker athletes, however, training will focus more on general strength. Each athlete will have a different formula depending on his or her own strengths and weaknesses.

Lesson 7: Discover the role of change

While Mateyev discovered the cyclical nature of form development, Bondarchuk's main contribution to training methodology was his method of using change in the training system. It was Bondarchuk's conclusion that athletes using most currently accepted methods of training would experience a plateau in performances after 4-6 years of training. This was due to a lack of change in training exercises. Consequently, when an athlete reaches the peak in his respective developmental model, training exercises must be adapted in order to continue improvement and prevent the stagnation of performance.

For example, imagine that you want to be able to do more push ups. You decide you will do 50 push ups a day for the next year. You will quickly notice that, after a while, the body will reach a plateau as it adapts to doing push ups. In order to continue to progress, the body will need a new stimulus, eg a new exercise to adapt to. If, after a month, you started doing the bench press, the change will allow your body to overcome that plateau while doing another exercise that still works towards your goal. When you return to doing push ups your body will be at a higher level and will be able to adapt once again to push ups.

This is very intuitive. There is a high correlation from throwing different types of hammers. However, many coaches overlook this by thinking of throwing as merely a way to develop technique. Runners, on the other hand, don't think of running as a way to just develop technique. To them, it is also a way for them to build endurance, strength, and other qualities needed to succeed. And, while cycling develops leg muscles and improves the cardiovascular and respiratory systems, few runners would argue that the majority of training time should be spent on a bike; though similar in nature, cycling does not transfer as well to running. Conversely, too many throwers think of throwing as merely a way to practice technique and spend the majority of their training time in the weight room. In truth, throwing is a strength exercise that transfers extremely well to competition results. It is one of the most versatile training tools available to a coach and should be used as the primary exercise in any training program.

In addition, training special strength allows athletes to train power and technique simultaneously, a more effective means of transferring power to the throw than training each separately. For high-level athletes in particular, it is more advantageous to train different elements together rather than splitting up the workout to train strength, speed, and technique separately.

Focusing on special strength does not mean that an athlete doesn't need to be "strong" to throw far. Bondarchuk believes a thrower must be strong to throw far. However, he has a different definition of strong. For example, many claim that world record holder Yuri Sedyh was not very strong, which is a false claim. Although many throwers have better personal bests in Olympic lifting than he, he was by no means bad at those lifts. For Bondarchuk, however, the Olympic lifts are not the only measure of strength. Sedyh's strength was concentrated in the more important special exercises. He was stronger than anyone at those exercises. For example, he had a personal best of 70.20m with the heavy 10 kilogram hammer and regularly did plate twists in training holding two or more 25 kilogram plates extended in front of his body. Special strength, rather than a great clean and jerk, is one reason why he, using only three turns, was able to accelerate the ball better than anyone.

Lesson 5: General strength still has a role at the right intensity

The superior importance of special strength does not mean that general strength is not important. Elite throwers still need a base level of strength to throw far. While this is fairly easy to attain, it still requires general weight training and all throwers should regularly do Olympic lifts, half squats, and other traditional lifts as described below.

One thing to note, however, is that general strength exercises are almost always done at a low intensity because they are secondary to special strength exercises. A heavy squat workout will tire your legs and make any technical work unproductive. Bondarchuk focuses on quick low intensity weights that allow the body to recover and continue to focus on throwing.

To improve, the body needs to be continuously adapting and that means that once it is accustomed to an exercise, it is time for a change. The change can be subtle (switching from a 8kg to 9kg hammer in training), but change is necessary to prevent stagnation.

Lesson 8: Discover the role of regularity

Too much change, however, and the adaptation process slows. If the body is given just one exercise to do, it can adapt very quickly. But if the body is given a dozen exercises, it will take much longer to adapt as there is more to adapt to. More exercises are ideal in the throwing events since more facets of the throw can be addressed at the same time. Furthermore, if exercises are changed daily or weekly, the body will not have enough time to adapt to the old exercises before it begins new exercises. This will not allow the results to grow.

Bondarchuk has also found that the intensity or volume of the exercise does not change how long it takes the athlete to adapt and reach top form. The amount of time stays constant with each individual and usually last two or three months. As an athlete ages from 25 to 30, the period of time also gradually lengthens.

Lesson 9: Put it all together

Successfully combining these elements is where science meets art. Several exercises can always be used, and it is up to the coach to determine what is best for the individual athlete. Below is a sample training program for a hammer thrower. It was done twice a day, five days a week (10 total training sessions a week) for approximately one month. As discussed above, individuality is key to Bondarchuk's training and this program should not be viewed as a template for use with any athlete. The points demonstrated in this workout, however, are applicable to everyone.

Exercise	Sets and Repetitions
6kg Hammer Throw	8 attempts
9kg hammer throw	8 attempts
Snatch	2 x 5 @ 60kg, 2 x 5 @ 70kg
Front Squat	2 x 5 @ 100kg, 2 x 5 @ 120kg
Plate Twist	3 x 10 @ 30kg
Good Mornings	3 x 6 @ 20kg
Sit Ups	3 x 10 @ 20kg
Medicine Ball Hammer Releases	2 x 15 @ 10kg

This training program hits all of the lessons discussed above:

- **Lesson 1: Science is your friend**

Throughout this training program, Bondarchuk measures the athlete's best training result at every training session and then records results so he can follow how the athlete is adapting to the new set of exercises.

- **Lesson 2: Athletes have limited time and energy**

This training program is designed so that every exercise will help the individual thrower improve his hammer result. General fitness exercises and other exercises are not included since they will not help the athlete work towards this goal.

- **Lesson 3: General strength often isn't the answer**

As you will notice, the amount of weight in the snatch and front squat is very low. While this may not increase general strength as quickly as heavier weights would, Bondarchuk's goal is to increase general strength in a way that also increases specific strength.

- **Lesson 4: Special strength often is the answer**

The majority of the athlete's training time is spent working on special strength. Half of the athlete's time is spent throwing the hammer, the most specific strength exercise there is. Another two weight room exercises mimic the hammer throw: plate twists mimic the core rotational movements in the hammer throw and medicine ball throws mimic the release. Another two exercises, good mornings and situps, also develop collateral core strength.

- **Lesson 5: General strength still has a role at the right intensity**

There are still two general strength exercises: the snatch and front squat. As mentioned above, both exercises are at a low intensity. Lower intensity exercises allow the body to recover and have energy for a high volume of throws and special strength exercises while still slowly increasing general strength. With ten training sessions a week, an athlete cannot recover from doing 200 kilogram half squats twice a day. By lowering the weight, Bondarchuk allows his athletes to do an exercise that is easy to recover from while still increasing general strength. Bondarchuk's programs typically have one exercise for each core muscle group used in the hammer: one Olympic lift, one leg lift, one twisting exercise, one back exercise, and one abdominal exercise.

- **Lesson 6: Pay attention to individuality**

This training program is unique to the specific athlete. All of the exercises were chosen with that athlete in mind. Other athletes had their own program. An athlete with good general strength may focus more on special strength, while a new athlete may focus more on technique. In addition, the length of time each athlete spends doing the training program is also individual. Bondarchuk knows how long it takes each of his athletes to adapt to a set of exercises and plans each training program accordingly.

- **Lesson 7: Discover the role of change**

At the end of this program, the athlete is given a brand new training program. All but one or two exercises are changed. For example, the thrower may switch from throwing the 6kg hammer to throwing the 7.26kg hammer and from doing the snatch to doing cleans. This allowed the body to continue to adapt to new exercises.

• **Lesson 8: Discover the role of regularity**

Throughout the month, every training session was the same. Ten times every week the athlete would do the same exercises in the same order at the same weight. By keeping the workout the same, the body is able to adapt more quickly and peak faster.

Lesson 10: Always remember technique

While a good training program is important, it means little without good technique. While Sedych had great special strength, he also had what most biomechanics agree is the most efficient technique in the history of the hammer. Strength means nothing unless the athlete is able to apply force to the hammer. Technique is the means by which the athlete transfers the strength into the throw. An athlete or coach should never overlook the big picture.

Conclusion

Elite athletes around the world train using different training methods. Bondarchuk's methods are not the only way to train world-class throwers, but his methods are the only way proven to produce multiple throwers over 84 metres in the hammer throw and countless other elite throwers in the shot put, discus, and javelin. Perhaps a new method will be developed and provide a better path to 90 metres, but for now Bondarchuk's method has proven the most successful and the underlying principles he relies on can teach any coach a few concepts as they prepare the next generation of athletes.

