

Running Head: HORIZONTAL JUMPS TRAINING FOR TRACK & FIELD

A Model for Horizontal Jumps Training for the Collegiate Track and Field Athlete

By

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Chapter 1

Introduction

Overview

Training for the horizontal jumps, long jump and triple jump, in track and field requires a nuanced and balanced plan to achieve the highest performance output. When devising a training plan, there are five primary physical performance components to be considered. The first is strength or the ability to produce large amounts of force. The second is speed or the ability to move the body rapidly. Next is flexibility, which is the ability to display high amplitudes of movement. Along with flexibility is coordination or the ability to perform motor skills with precision. Lastly, endurance, the ability to perform large workloads and resist fatigue (Lane and Schexnayder, 2018). Each of these components must be developed intentionally within the horizontal jumper. This will allow for the jumper to increase their performance over time.

Statement of the Problem

Horizontal jumpers require a specific approach to training. As an event group, it is easy to define the commonalities the horizontal jumper has with sprints. However, due to technical differences and event training discrepancies, the horizontal jumper must be trained to meet the events specifications. Coaches must take note to train the horizontal jumper with a nuanced and balanced program that shows variations from work done to train a 400m runner, for instance, in order to achieve the best results.

Purpose Statement

The purpose of this project was to present an example of a training program for a horizontal jumper. This project attempts to expose what aspects of training are essential for jump success as well as looking at a specific training program that could be used to develop a horizontal jumper. Data were also examined for jumpers that were trained using components of the prescribed training modalities. In analyzing these data, coaches will better be able to determine what training modalities need to be altered, deleted, or added to the training program.

Guiding Questions

The following questions guided this capstone project:

1. What speed development components are utilized in training the horizontal jumper?
2. What strength training factors should be considered in training the horizontal jumper?
3. What role does technique acquisition play in the training of horizontal jumpers?
4. How and when can these factors be applied to optimize a Division III horizontal jumper's performance?

Definition of Terms

- **Horizontal Jumps:** track and field events where the performance is measured as a distance, such as the long jump and the triple jump.
- **Long Jump:** a track and field event in which the athletes combine speed, strength, and agility in an attempt to leap as far as possible from a takeoff point.

- Triple Jump: a track and field event where the competitor runs down the track and performs a hop, a bound, and then a jump into the sand pit.
- Strength: the ability to produce force.
- Speed: the ability to move the body rapidly.
- Flexibility: the ability to display high amplitudes of movement.
- Coordination: the ability to perform motor skills with precision.
- Endurance: the ability to perform large workloads and resist fatigue.
- Acceleration: an object or individual's capacity to change their velocity.
- Absolute Speed: an individual's ability to access their full potential of speed.
- Speed Endurance: the ability to prolong the amount of time where a near maximal speed can be maintained.
- Olympic Lifts: the snatch, clean and jerk, in addition to their many derivatives, are often used to develop strength and explosiveness to improve performance in sport.
- Free Weight Exercises: lifts, such as squats and presses, which are designed to develop absolute strength. Often referred to as Static Lifts within the context of training theory for track and field.
- Ballistic Lifts: lifts that force the muscles to produce the greatest amount of force in the shortest amount of time. Often to throw a projectile or jump.
- Weight Training Circuits: a combination of lifts that are performed successively with little or no rest in between exercises.

- **General Strength Exercises:** a combination of exercises used to improve muscular strength and strength endurance. This could include Body-weight or exercises with a light load. Also included are Medicine Ball Exercises.
- **Multi-throws:** high intensity throws, performed from various positions, using a shot or heavy medicine ball as a load.
- **Multi-jumps:** jumping activities that develop reactive strength and the elastic response in the athlete.
- **Drills and Technical Exercises:** activities, which provide the opportunity to teach fundamental skills common to multiple events, or partial skills that, must be assembled into a technical model.
- **Technical Rehearsal:** refers to the actual execution of the complete skill or large portions of the skill, in an environment that resembles the competition environment.
- **Periodization:** proper application of each training factor through a precise plan that is implemented in phases over the designated training cycle. Phases include: General Preparation, Specific Preparation, Pre-Competition, and Competition.
- **Division III:** a division of the National Collegiate Athletic Association (NCAA) that consists of athletic programs at colleges and universities that choose not to offer athletic scholarships to their student-athletes.

Chapter Summary

Training for both the long jump and triple jump, or horizontal jumps, requires a specialized training program that address the specific needs of the events. Training programs should cover modalities that develop speed, strength, flexibility, coordination,

and endurance. These components of training are universal to the sport of track and field, however, the horizontal jumps training program requires a unique approach to each. In addition, the training program should offer plenty of opportunities for technique development. Teaching proper techniques and training protocols will allow the horizontal jumper to achieve greater success. This project will take an in-depth look at the specific needs of a horizontal jumps training program and how those protocols could be implemented throughout a training year. Data of horizontal jumper performances will also be analyzed to decipher which training modalities may need to be altered, added, or deleted from the training program.

Chapter 2

Review of Related Literature

Overview

Training for the horizontal jumps in track and field requires a specialized training plan to achieve the highest performance output. When devising a training plan, there are five primary physical performance components to be considered. The first is strength or the ability to produce large amounts of force. The second is speed or the ability to move the body rapidly. Next is flexibility, which is the ability to display high amplitudes of movement. Along with flexibility is coordination or the ability to perform motor skills with precision. Lastly, endurance, the ability to perform large workloads and resist fatigue (Lane and Schexnayder, 2018). Each of these components must be developed intentionally within the horizontal jumper.

Below you will find each of the components addressed both directly and indirectly. During speed development work the athlete works to improve their speed, flexibility, coordination, and endurance. With strength development the athlete works to improve their strength, coordination, endurance, and flexibility. Under technique acquisition and practice the athlete is becoming more coordinated while building strength, speed, and endurance (Lane and Schexnayder, 2018).

Speed Development for the Horizontal Jumper

Speed development components for horizontal jumpers requires work on acceleration development, absolute speed development, and speed endurance. All three components allow for the complete development of the horizontal jumper and must be

administered to varying degrees throughout the training year. Early emphasis on acceleration is ideal then moving to absolute speed and speed endurance later in the training year. It should be noted that all three components are utilized when devising training for sprint and hurdle athletes, as well (Anderson, 2013).

Acceleration development work is training designed to improve acceleration mechanics. Lane & Schexnayder (2018) stated, “When examining human performance, most athletic populations require an acceleration of approximately 40 meters to reach maximal velocity, so most acceleration development repetitions are 40 meters or less in length.” Acceleration work must be performed at high intensities. While formal monitoring of the recoveries is not usually necessary, adequate rest must be provided to insure the quality of each effort (Pfaff, 2014). Types of acceleration development work include acceleration development sprints, which are sprints of short distances to isolate acceleration abilities and mechanics. Some of these exercises include hills sprints or resisted runs, such as sled pulls or parachute runs (Badon, 2013).

Absolute speed development work is training designed to improve absolute speed qualities. Anderson et al. (2013) have shown that humans can only maintain maximal velocity for a few seconds. Thus, absolute speed development should involve placing the athlete into situations of maximal velocity for periods of time not exceeding three seconds. Absolute speed development work must also be performed at maximal intensities. When choosing rest intervals, it is imperative to err on the side of excess to insure work quality, and volumes should be altered as power levels drop (Coonen, 2013). Examples of absolute speed development include speed development sprints (distance ranging from 40 to 80 meters), variable speed runs where the athlete changes pace at

prescribed intervals, and overspeed training which can be completed through assisted running techniques, such as bungee pulls. Specifically, for the horizontal jumper, runway approach runs should be used as absolute speed development.

Speed endurance work is training designed to improve speed endurance qualities, specific coordination, freedom of movement at high speeds, and glycolytic capacity and power (Lane and Schexnayder, 2018). Speed endurance work must place the athlete into maximal velocity situations that are longer than three seconds in length, permitting the athlete to combat the degradation of absolute speed qualities that occurs at this point (Anderson, 2013). Speed endurance sprints must involve runs greater than 80 meters in length, so that the athlete is placed into a maximal velocity situation for a period of time consistent with the time frames mentioned previously. Speed endurance work, for jumpers, may extend as far as 300 meters and is prescribed during the competition portion of the season (Lane and Schexnayder, 2018).

Strength Training for the Horizontal Jumper

Strength training for the horizontal jumper requires a balance of multiple components throughout the training year. The horizontal jumpers needs to touch on a number of different strength development modalities during each training cycle or phase. These components can include, but is not limited to, traditional weight training exercises, general strength exercises, medicine ball exercises, multi-throws, and multi-jumps. Proper planning and implementation of these components is imperative to the complete and balanced development of the jumper.

Traditional weight training includes exercise that fall underneath the categories of Olympic lifts, Static lifts (Free Weight Exercises), Ballistic lifts, and Weight training

circuits. Olympic lifts develop absolute strength, power, reactive strength, and coordination (Lane and Schexnayder, 2018). They are extremely complex lifts, requiring almost pure isometric activity at some times in some muscle groups, while requiring very high power and speed of movement in others. When done correctly, they require muscle stabilization patterns and locomotive activity that is very similar to what is seen in athletics, making them very specific to performance. Because of the high technical demand and power outputs of this type of work, they are typically sequenced before all other types of weight training (Kyprianou, 2010). Static lifts are a primary tool for absolute strength development, and enhance postural qualities and anchoring ability when technique and loading are appropriate. While there may be exceptions at times, full ranges of motion should be employed in the static lifting program to insure strengthening kinetic chains and body parts in the correct ratios (Huber, 2013). Ballistic lifts are fast, repeated, and weighted movements that involve gross movements and major muscle groups. These lifts enhance power, elastic strength, and absolute strength, and greatly resemble the demands of competition. The nature of and impacts associated with ballistic lifts offer some injury risk. Athletes should achieve high levels of general strength, power, and absolute strength before ballistic training in order to maximize the benefits they will get from these exercises (Kyprianou, 2010). Weight training circuits are used to develop endocrine and energy system fitness and typically employ smaller muscle groups. This helps to improve the effectiveness of other strength training agents. Because of the metabolic demands and restorative properties of the circuits, strict adherence to training parameters, such as recovery times and exercise order, should be

established. With these circuits, hypertrophy may also be a desired or undesired result dependent on the needs of the individual athlete (Cissik, 2015).

General strength exercises can be used to improve muscular strength and strength endurance. These activities are often the best way to address muscles and muscle groups not directly involved in the gross movement most used in training. Because of the lack of external loading, general strength work is a good way to prevent and alleviate muscle and strength imbalances. Lane and Schexnayder (2018) state, “General strength can then enhance gross motor performance by preventing imbalance related dysfunction and by activating and educating smaller muscle groups that are responsible for proper action of gross movements.” Like weight training circuits, general strength work can be used as a tool to achieve endocrine and energy system fitness, while lessening the chances of repetitive movement syndromes (Kyprianou, 2010). They can serve as a primary strength training modality for young athletes, and a primary recovery modality for older athletes. Examples include calisthenics, stabilization routines, and connective tissue and fascia routines.

Medicine ball work produces many of the same benefits of general strength work due to the relatively light loading and similar nature of the activities. These benefits include improvements in coordination, body control, muscular strength, and strength endurance. These exercises can be chosen to activate small muscle groups and enhance the efficiency of large muscle groups. They can also be used as a tool to achieve endocrine and energy system fitness when done in circuit fashion (Cissik, 2015). They also seem to alleviate some of the imbalance situations created by other parts of the training program. Additionally, medicine ball work can be used to enhance postural

strength and the body's ability to withstand impact by catching a thrown ball (Abdel Wahab, 2016). Examples include various catch and throw combinations, abdominal and spinal exercises, and calisthenic type exercise using the ball as a light load.

Multi-throws are high intensity throws, performed from various positions, using a shot or heavy medicine ball as a load. At times jumps may be used in combination with the throws to intensify the loading phase of the exercise. Multi-throws develop power and coordination. Like Olympic lifts, multi-throws require muscle stabilization and locomotive activity that is very similar to what we see in athletics, and thus are very specific to performance (Huber, 2013).

Multi-jumps are jumping activities that develop reactive strength and the elastic response. They also develop technical efficiency when the characteristics of force application to the ground are considered. They are highly specific, so they serve as an important special strength and technical development tool as well (Huber 2013). Categories of multi-jump exercises include short bounds, in place jumps, extended bounds, and depth jumps.

Technique Acquisition for the Horizontal Jumper

Technical training consists of activities designed to provide opportunity to teach the specific movements and skills involved in the event. These activities normally fall into two categories: Drills and Technical exercises and Technical Rehearsal (Lane and Schexnayder, 2018). Drills and Technical exercises are activities which provide the opportunity to teach fundamental skills common to multiple events, or partial skills that must be assembled into a technical model. These exercises may be very event specific, or might address very rudimentary mechanics that may be addressed with medicine ball

throwing routines, hurdle drills, and rudimentary jumping activities. Technical Rehearsal refers to actual execution of the complete skill or large portions of the skill, in an environment that resembles the competition environment (Lane and Schexnayder, 2018).

When devising the technical components to the horizontal jumps training program, it is imperative to design the training around the technical commonalities between the horizontal jump events. Both events, the long jump and triple jump, require an approach down the runway. The approach should provide the jumper with horizontal momentum and velocity (Howe, 2016). This horizontal velocity also eccentrically loads the muscles of the takeoff leg in all jumping events. The approach should place the jumper in an accurate location from which to execute the takeoff (Schexnayder, 1993). The purpose of the takeoff is to permit preservation of the key components of the approach. The takeoff should involve the creation of vertical forces and velocities, so that the jumper leaves the ground at an angle that allows for maximal performance. Appropriate takeoff angles are 18-21 degrees in the long jump and 11-15 degrees in the triple jump (Grimes, 2018). In both events, the approach and takeoff determine the flight path of the athlete making these technical elements the most crucial to practice. The flight path, therefore, is predetermined and cannot be altered during flight (Peterson, 2013).

Application of Training Factors

Proper application of each of the aforementioned training factors is essential to the development of the horizontal jumper. Application of these factors in a thoughtful and precise plan throughout the training year is known as periodization. DeWeese et al. (2015) stated that the primary goals of periodization are “a) an appropriate balance of

training loads and competitive readiness during the season, b) fatigue management and the reduction of overtraining potential, and c) adequately staging and timing of the peak. DeWeese also argues that there is strong evidence to suggest that the manner in which training is presented will make a difference on the athlete's overall performance (2015). When discussing periodization within the context of track and field, it is easiest to break the training year down into four phases: General Preparation Phase, Specific Preparation Phase, Pre-Competition Phase, and Competition Phase (Lane, 2014).

During the General Preparation Phase of the horizontal jumper, there should be an emphasis on acceleration. This skill must be practiced from day one of the training year and rehearsed throughout each phase (Anderson, 2013). The primary focus of strength development in the General Preparation Phase should be an equal implementation of Olympic and static, or free weight, lifts. Weight training circuits, general strength work, medicine ball routines, as well as multi-jumps and multi-throws should all be implemented in a supplementary fashion throughout the training year to promote muscle balance, coordination, and recovery. The General Preparation Phase is used as a time for the introduction of technical aspects of the events. These should be prescribed through drills and other technical exercises (Schexnayder, 2014). Volumes during this phase of the training year should be high with short recoveries while keeping the intensities low (Eggerth, 2015).

During the Specific Preparation Phase absolute speed development is added into the training along with acceleration. Runway approach runs should be used as an absolute speed development modality (Nielsen, 2011). The training done in this phase of the year should be some of the most difficult because training volumes are still relatively

high, but the intensities have also increased. During strength development, the focus should shift more in favor of Olympic lifts and less on slower-velocity static lifts. As with the running portion of the training, volumes and intensities are both at a relatively high level (Eggerth, 2015). The Specific Preparation Phase is where technical acquisition becomes more of a primary focus. The bulk of the technique practice should be completed in this phase to set up proper technical rehearsals for later in the training year (Lane & Schexnayder, 2018).

The Pre-Competition and Competition Phases of the training year implement speed endurance work into the speed development of the horizontal jumper. Throughout these phases, the horizontal jumper should be touching on all three aspects of speed development: acceleration, absolute speed, and speed endurance (Schexnayder, 2014). Strength development modalities should move away from static lifts with the primary focus being Olympic lifts. Ballistic lifts should be utilized when and where appropriate depending on each specific jumper (Kyprianou, 2010). Technical aspects of the training should now be focused on technical rehearsal and asking the athlete to perform tasks that most resemble competition (Schexnayder, 2014). During these two phases, it is imperative that volumes are kept low and intensities high. Proper rest and recovery (typically full recoveries) should be implemented during training sessions, as well as, between training sessions (Eggerth, 2015).

Chapter Summary

Training for the horizontal jumps in track and field requires a specialized training plan to achieve the highest performance output. When devising a training plan that addresses speed development, strength development, and technique acquisition, it is

imperative to remember the five primary physical performance components. Strength, speed, flexibility, coordination, and endurance must all be considered (Lane and Schexnayder, 2018). When a training program that is balanced and encompasses all of these major components, the horizontal jumper will be better set up for success.

Speed development work must be accomplished through direct and incremental acceleration work, absolute speed development, and speed endurance (Anderson, 2013). Strength development must encompass a holistic approach through the use of traditional weight training, general strength training, medicine ball work, multi-throws and multi-jumps. It is important to remember that in the traditional weight training segments of the training that Olympic lifts are sequenced prior to the completion of any other weight training components (Kyprianou, 2010). Also, proper protocols must be followed when implementing components of high power output, such as ballistic lifts and multi-jumps. And finally, technique acquisition should be practiced and rehearsed throughout the training year to insure proper development (Lane and Schexnayder, 2018). The proper implementation of the protocols in a balanced way is known as periodization. This concept needs to be consider because it may have an extreme factor in the performance outcome of the horizontal jumper (DeWeese et al., 2015).

Chapter 3

Criteria

Overview

Training for the horizontal jumps in track and field requires a nuanced and balanced plan to achieve the highest performance output. When devising a training plan, there are five primary physical performance components to be considered. Strength, speed, flexibility, coordination, and endurance must be developed intentionally within the horizontal jumper training plan (Lane and Schexnayder, 2018).

Throughout this project you will find each of the components addressed both directly and indirectly. To enhance speed development, the athlete works to improve their speed, flexibility, coordination, and endurance. With strength development the athlete works to improve their strength, coordination, endurance, and flexibility. Under technique acquisition and practice the athlete is becoming more coordinated while building strength, speed, and endurance (Lane and Schexnayder, 2018).

Sample

The performances of twelve Division III college jumpers from Carthage College were analyzed. The breakdown of the twelve athletes includes six male and six female jumpers. Of the six male jumpers, all six competed in the long jump, while two also competed in the triple jump. Of the six female jumpers, three contested both jumps, two competed only in the long jump, and one competed only in the triple jump.

Data Collection

Data were collected and compiled over the course of the year. The performances of each jumper is public information and can be found online as competition performances are published and distributed. Previous years performances were also gathered.

Procedures

This section contains a training plan for a horizontal jumper that highlights the training theories and modalities discussed previously. The reader will find a Training Plan Overview and a Proposed Training Week from each of General Preparation, Specific Preparation, Pre-Competition, and Competition phases. It should be noted that this is a proposed training plan and not the exact plan presented to the sample of athletes used. This was done because their training was written and directed by multiple coaches instead of a single coach. Therefore, a proposed plan is presented to better reflect a single coaching style and philosophy. Each component of the proposed training plan can be found in Appendices A-E.

Data Analysis

By using components of the proposed training plan, one can analyze the data in a number of ways. For the purposes of this study, performance progressions of the athletes were recorded and plotted as a line graph, as seen in the Results Chapter. The best marks from the 2019 season were also recorded and compared to each athlete's best marks from a previous season. If the athlete had never competed in that event prior to the 2019 season, their first mark recorded was utilized as their previous best mark.

Chapter Summary

Training for the horizontal jumps in track and field requires a specialized training plan to achieve the highest performance output. When devising a training plan that addresses speed development, strength development, and technique acquisition, it is imperative to remember the five primary physical performance components. Strength, speed, flexibility, coordination, and endurance must all be considered (Lane and Schexnayder, 2018). When a training program that is balanced and encompasses all of these major components, the horizontal jumper will be better set up for success.

This project reflects the training of athletes that have been coached by multiple coaches. While one coach was in charge of directing the technical aspects of the events, another was implementing training for the speed and strength development. It should be noted that, to ensure proper development and progression, this is not an ideal training scenario for the athletes because of conflicting opinions on training theory. To better reflect upon the training necessitated by a horizontal jumper, a proposed training plan has been presented to help investigate where and how training could potentially be improved.

Chapter 4

Project

Overview

Training for the horizontal jumps in track and field requires a plan to achieve the highest performance output. When devising a training plan, there are five primary physical performance components to be considered. Strength, speed, flexibility, coordination, and endurance must be developed intentionally within the horizontal jumper training plan (Lane and Schexnayder, 2018). This project was designed to help devise the best training theories and modalities to assist the coach and horizontal jumper find success.

Findings

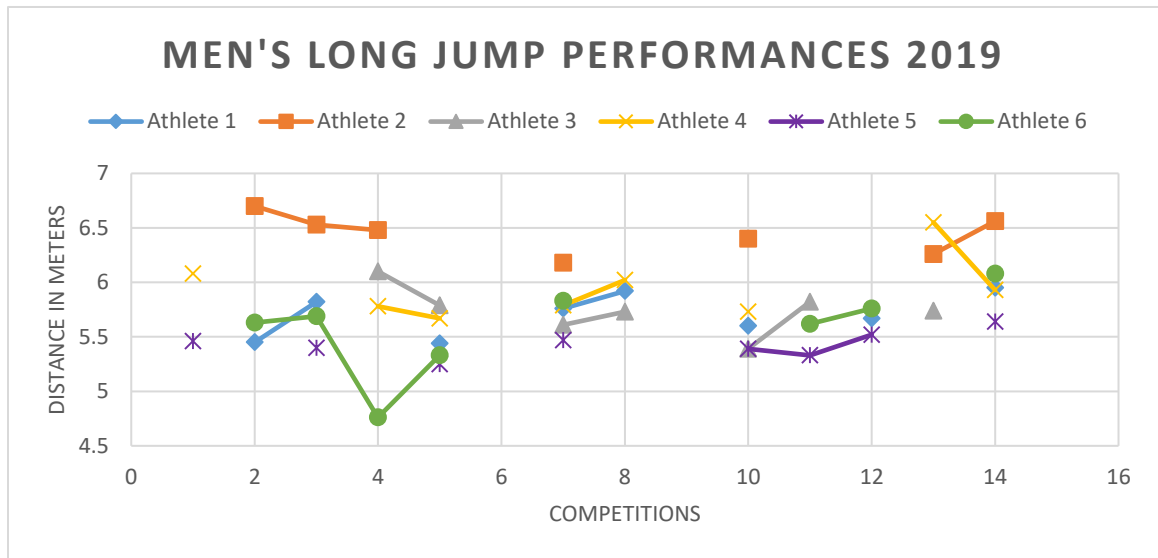


Figure 1. Men's Long Jump Performances 2019

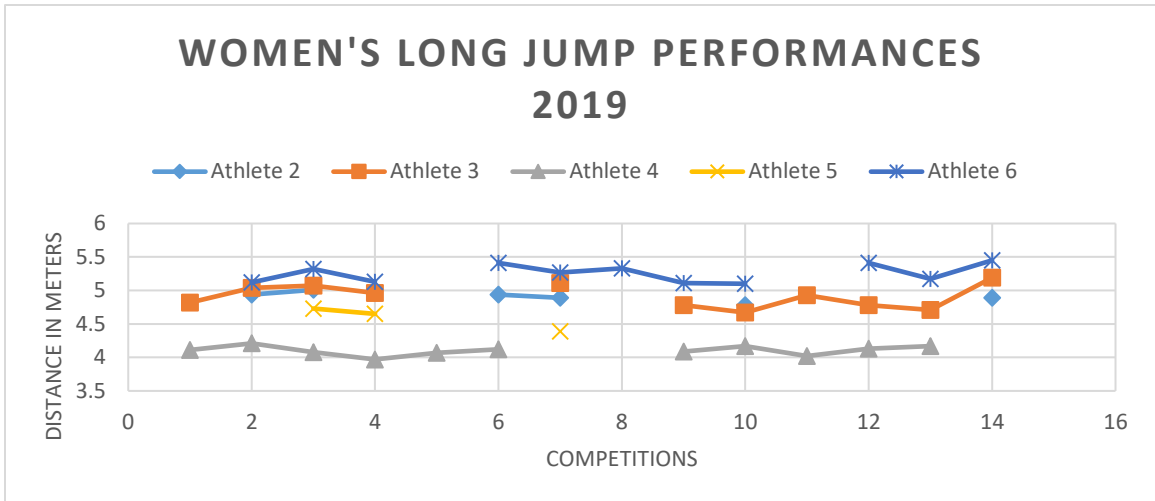


Figure 2. Women's Long Jump Performances 2019

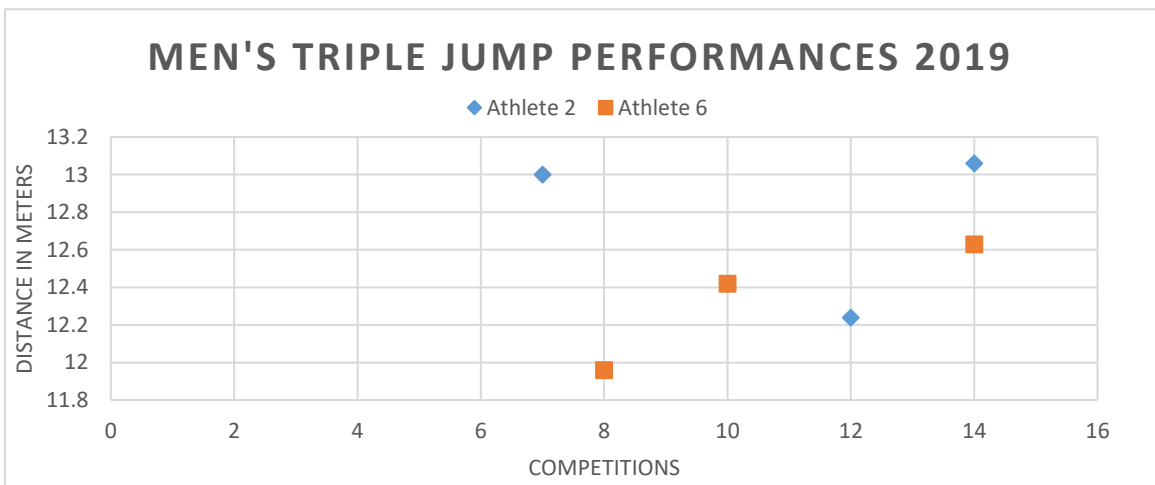


Figure 3. Men's Triple Jump Performances 2019

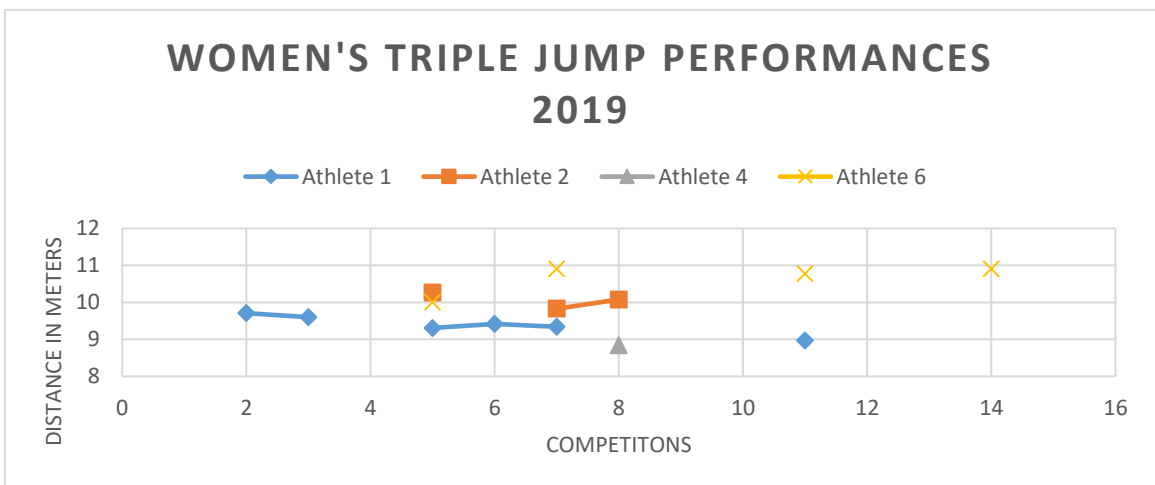


Figure 4. Women's Triple Jump Performances 2019

Table 1	2019 Best (LJ)	Previous Best (LJ)	2019 Best (TJ)	Previous Best (TJ)
Men				
Athlete 1	5.95	6.00	NA	NA
Athlete 2*	6.70	6.91	13.06	13.32
Athlete 3**	6.10	6.12	NA	NA
Athlete 4***	6.55	6.08	NA	NA
Athlete 5***	5.64	5.46	NA	NA
Athlete 6***	6.08	5.63	12.63	12.13
Average	6.17	6.03	12.85	12.73
Percent Change	2.22%		0.93%	
Paired Sample T-test	0.285		0.805	
Women				
Athlete 1	NA	NA	9.71	9.86
Athlete 2****	5.01	5.07	10.27	10.41
Athlete 3*****	5.19	5.33	NA	NA
Athlete 4	4.21	4.14	8.84	8.67
Athlete 5	4.73	4.68	NA	NA
Athlete 6	5.45	5.31	10.91	10.52
Average	4.92	4.91	9.93	9.87
Percent Change	0.24%		0.68%	
Paired Sample T-test	0.821		0.641	
Notes				
* Men's Athlete 2 dislocated his right patella at the end of the 2018 season.				
**Men's Athlete 3 took a gap year between completion of high school and start of college.				
***Men's Athletes 4-6 had never competed in the long jump prior to the 2019 season.				
Therefore, their previous best is their first legal mark from the 2019 season.				
****Women's Athlete 2 trained for the Multit-Events.				
*****Women's Athlete 3 suffered a hamstring injury in the middle portion of the indoor season.				

Results

The results of the jump performances were averaged and compared to the average of the previous best performance. By calculating the percent change, an increase overall in jump performance is noted. The average performance in the men's long jump had the greatest increase in percent change at 2.22%. Men's triple jump had the next best increase at 0.93%. Both of the women's events had lower percent change increases with the triple jump at 0.68% and the long jump at 0.24%. In calculating a Paired Sample T-test, it should be noted that the percent change for each jump is not significant.

Chapter Summary

The results of jump performances from the 2019 season were compiled and analyzed. In order to document improvement, the performances were mapped out to show progress over the course of the year. An average of the best marks from each of the athletes was used and compared against the average of their previous best marks. The results show an overall increase in performance when analyzing the percent change of the previous best to the 2019 season. However, after calculating a Paired Sample T-test, it is found that the mean change in performance in all events was not significant ($p > 0.05$).

Chapter 5

Discussion, Conclusions, Implications

Discussion

Training for the horizontal jumps in track and field requires a specialized training plan to achieve the highest performance output. When devising a training plan, there are five primary physical performance components to be considered: strength, speed, flexibility, coordination, and endurance. These variables must be developed intentionally within the horizontal jumper training plan (Lane and Schexnayder, 2018). This project was designed to help devise the best training theories and modalities to assist the coach and horizontal jumper to find success. The analysis of the results for this project show that, despite there being an overall increase in the percent change of the performances of the athlete's previous bests compared to the 2019 season's bests, there was not enough of an increase to show statistical significance.

Conclusions

After assessing the results and looking at the performances of the jumpers throughout the year, it can be concluded that the training they received did not put them in an ideal scenario for success. It should be noted, however, that even if the training environment did not elicit an ideal response, there was still an overall percent increase in the jump performances. This, at the very least, shows an incremental amount of improvement and should help the coach decipher what aspects of the training can remain, what aspects need to be altered, and which components may need to be removed altogether. The results suggest that training should be monitored and guided by the

performance data (DeWeese et al., 2015). By monitoring performance data, coaches should be able to assess practice plans and adjust volume and intensity outputs for future training. This should also provide coaches with key information to help prevent overtraining. As the season progresses and injuries arise, performance data should help inform the needs of each individual athlete and whether adjustment should be made in either the speed, strength, or technical components of the training. Therefore, despite the percent change increases deemed not significant, the small increase that were shown should be seen as starting point when devising the training for future years.

Implications and Limitations

There are a number of implications and limitations to note concerning this project. Firstly, the sample size for the data collected is small. This, likely, contributed to the significance values. For example, it is difficult to get an accurate understanding of the data when the sample size was only two, as was the case in the men's triple jump. An increase in the sample size and the analysis of those results would allow for a more accurate assessment of the value of the training prescribed. One of the other limitations of this project was that the training was being written by multiple coaches. This could potentially have major impacts on the success of the jumpers because of the differences in coaching tactics, philosophies, and training implementation. In this case, the jumpers were receiving their technical training from one coach, while their speed and strength development was designed and implemented by another. Ideally, training should be managed by one coach or multiple coaches that understand the training protocols. If multiple coaches are not clear on the training protocols implemented athlete performances can be negatively influenced.

Further Research

As stated previously, in order to get a more accurate assessment of the training being prescribed to the horizontal jumper, a larger sample size would be needed. This project, however, should give coaches an indication of which aspects of the training are of utmost importance for the horizontal jumper. Each year performances should be assessed and analyzed in order to maintain a balanced and nuanced training plan. This will help ensure that the horizontal jumpers are getting what they need to be successful. Further research could be done to track improvement over the course of an athlete's athletic career. It should also be noted that these same research tactics could be applied to other event areas in the sport of track and field. By tracking the progress of each athlete and devising training that is most suited for the events they compete in, a coach should be able to develop a team that is well-rounded and sees constant improvement.

References

- Abdel Wahab, Karim. "Straighten Up: The Importance of Proper Posture and the Quality of Stiffness in Sprinting." *Techniques*, vol. 9, no. 3, Feb. 2016, pp. 24–28.
- Anderson, Vince. "Maximal Velocity Mechanics and Cuing." USTFCCCA National Convention. USTFCCCA National Convention, 2013, Orlando, Florida, JW Marriot Orlando, Grande Lakes.
- Badon, Tommy. "Acceleration: Mechanics, Drills, Synthesis." USTFCCCA National Convention. USTFCCCA National Convention, 2013, Orlando, Florida, JW Marriot Orlando, Grande Lakes.
- Banks, Willie. "Stepping Up: Correcting Errors to Improve Performance." *Techniques*, vol. 9, no. 2, Nov. 2015, pp. 8–14.
- Brady, Sean. "Long Jump: A Pragmatic and Simple Approach." USTFCCCA National Convention. USTFCCCA National Convention, 2018, San Antonio, Texas, JW Marriot San Antonio Hill Country Resort & Spa.
- Chamov, Iliyan. "Triple Jump Practice Parameters." *Techniques*, vol. 8, no. 4, May 2015, pp. 34–38.
- Chamov, Iliyan. "Triple Jumpers: The Different Characteristics of Male and Female Jumpers." *Techniques*, vol. 12, no. 2, Nov. 2018, pp. 8–15.
- Cissik, John M. "Power: Strength Training and the Horizontal Jumps." *Techniques*, vol. 8, no. 3, Feb. 2015, pp. 6–10.
- Coonen, Michael. "Teaching Speed: Applying Force Quickly." *Techniques*, vol. 7, no. 1, Aug. 2013, pp. 23–28.
- DeWeese, Brad H, et al. "The Training Process: Planning for Strength-Power Training in Track and Field. Part 1: Theoretical Aspects." *Journal of Sport and Health Science*, vol. 4, 2015, pp. 308–317.
- DeWeese, Brad H, et al. "The Training Process: Planning for Strength-Power Training in Track and Field. Part 2: Practical and Applied Aspects." *Journal of Sport and Health Science*, vol. 4, 2015, pp. 318–324.
- Eggerth, Andy. "Restoration in the Speed/Power Events." USTFCCCA National Convention. USTFCCCA National Convention, 2015, San Antonio, Texas, JW Marriot San Antonio Hill Country Resort & Spa.

- Grimes, Kris. "Adding Speed to Flight - Building the Common Takeoff." USTFCCCA National Convention. USTFCCCA National Convention, 2018, San Antonio, Texas, JW Marriot San Antonio Hill Country Resort & Spa.
- Howe, Quincy. "A Triple Jump Journey - Evaluation, Implementation, Execution." USTFCCCA National Convention. USTFCCCA National Convention, 2017, Phoenix, Arizona, JW Marriot Phoenix Desert Ridge Resort & Spa.
- Howe, Quincy. "Approach Velocity: The Factor That Most Influences Long Jump Performance." *Techniques*, vol. 10, no. 2, Nov. 2016, pp. 8–17.
- Huber, Lucky. "Power Training for Jumpers." USTFCCCA National Convention. USTFCCCA National Convention, 2013, Orlando, Florida, JW Marriot Orlando, Grande Lakes.
- Kyprianou, Petros. "Strength and Conditioning for Horizontal Jumps." *Techniques*, vol. 3, no. 4, May 2010, pp. 12–15.
- Lane, Todd, and Irving Schexnayder. "Jumping Event Specialist Certification." Track and Field Academy. June 2018, Naperville, Illinois, North Central College.
- Lane, Todd. "Final Step Mechanics in the Long Jump." USTFCCCA National Convention. USTFCCCA National Convention, 2017, Phoenix, Arizona, JW Marriot Phoenix Desert Ridge Resort & Spa.
- Lane, Todd. "Track & Field Technical Certification." Track and Field Academy. Jan. 2014, Winona, Minnesota, Saint Mary's University of Minnesota.
- Mclean, Damion. "Developing Women Triple Jumpers." USTFCCCA National Convention. USTFCCCA National Convention, 2013, Orlando, Florida, JW Marriot Orlando, Grande Lakes.
- Nielsen, Dave. "Approach Run and Acceleration Patterns." *Techniques*, vol. 5, no. 1, Aug. 2011, pp. 8–13.
- Petersen, Nic. "Technical Aspects of the Long Jump." USTFCCCA National Convention. USTFCCCA National Convention, 2013, Orlando, Florida, JW Marriot Orlando, Grande Lakes.
- Pfaff, Dan. "Current Trends in Sprint Mechanics." USTFCCCA National Convention. USTFCCCA National Convention, 2014, Phoenix, Arizona, JW Marriot Phoenix Desert Ridge Resort & Spa.
- Schexnayder, Irving. "Energy Systems and Training: Physiology of the Jumping Events." *Techniques*, vol. 9, no. 1, Aug. 2015, pp. 8–15.

Schexnayder, Irving. *Lowering the Center of Mass for the Triple Jump Takeoff*. Louisiana State University, 1995.

Schexnayder, Irving. *Mechanics of the Jump Approach*. University of Southwestern Louisiana, 1993.

Schexnayder, Irving. "Peaking the Jumper." USTFCCCA National Convention. USTFCCCA National Convention, 2014, Phoenix, Arizona, JW Marriot Phoenix Desert Ridge Resort & Spa.

Schexnayer, Irving. "Gaining Ground: Development of Speed in the Horizontal Jumper Is One of the Most Important and Difficult Tasks That Coaches Face." *Techniques*, Aug. 2007, pp. 19–21.

Schumpert, Berry. "Triple Jump Development from the Ground Up." USTFCCCA National Convention. USTFCCCA National Convention, 2014, Phoenix, Arizona, JW Marriot Phoenix Desert Ridge Resort & Spa.

Stamps, Hassaan. "Technical Considerations in the Jumps." USTFCCCA National Convention. USTFCCCA National Convention, 2018, San Antonio, Texas, JW Marriot San Antonio Hill Country Resort & Spa.

Strelnitski, Vladimir, et al. "The Long Jump." *Techniques*, vol. 11, no. 1, Aug. 2017, pp. 18–24.

Sunquist, Eli. "The Complexity of the Triple Jump." *Techniques*, vol. 4, no. 2, Nov. 2010, pp. 29–32.

Taylor, Nathan. "Jump to It." *Techniques*, vol. 5, no. 2, Nov. 2011, pp. 8–11.

Appendix A

Training Plan Overview

		Training Plan Overview																																			
Competitors	Date (Mondays)	Indoor												Outdoor																							
		Preparatory			Specific Preparation			Strength			Speed			Technique			Work Capacity																				
Periods		General Preparation			Precompetition			Competition			Precompetition			Competition																							
Phases		Preparatory			Specific Prep			Review			Synthesis			Peaking																							
Mesocycles		1			2			3			4			5			6			7			8			9											
Mesocycle Theme 1		Work Capacity			Technique			Speed			Strength			Synthesis			Peaking			Review			Synthesis			Peaking											
Microcycles		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume (1-10)		10	10	2	9	9	1	8	8	2	7	7	7	1	5	5	5	5	5	5	5	3	3	3	3	3	5	5	5	4	4	4	4	4	2	2	2
Intensity (1-10)		1	1	1	9	3	3	3	10	4	4	4	9	6	6	6	10	8	8	8	8	9	9	9	9	9	5	5	5	5	5	8	8	8	10	10	10
Comments		Male, age 19, collegiate freshman.																																			
		Competes in both Long Jump, Triple Jump, and is also a long sprinter																																			
		Training will begin in early September, and championship meets are in February and May.																																			

Appendix B

Proposed Training Week: General Preparation Phase

General Preparation Phase							
Microcycle Location:	Microcycle Number: 2		Microcycle Date: 9/11				
Session Number	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7
Day	Monday - Neutral	Tuesday - General	Wednesday - Neutral	Thursday - General	Friday - Neutral	Saturday - Extensive	Sunday
Unit 1	1. Warmup Jog 400m	1. Warmup Jog 800m	1. Warmup Jog 400m	1. Warmup Jog 800m	1. Warmup Jog 400m	1. Warmup Jog 800m	1. Off
Unit 1 Description	2. Dynamic Flexibility 5 exercises x 12 reps	2. Dynamic Flexibility 6 exercises x 12 reps	2. Dynamic Flexibility 5 exercises x 12 reps	2. Dynamic Flexibility 6 exercises x 12 reps	2. Dynamic Flexibility 5 exercises x 12 reps	2. Dynamic Flexibility 6 exercises x 12 reps	2.
Unit 2 Description	Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	Leg Swings (Side-to-side), Leg Swings (Front/Back), Donkey Kicks, Fire Hydrants, Eagles, Scorpions	Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	Leg Swings (Side-to-side), Leg Swings (Front/Back), Donkey Kicks, Fire Hydrants, Eagles, Scorpions	Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	Leg Swings (Side-to-side), Leg Swings (Front/Back), Donkey Kicks, Fire Hydrants, Eagles, Scorpions	Leg Swings (Side-to-side), Leg Swings (Front/Back), Donkey Kicks, Fire Hydrants, Eagles, Scorpions
Unit 3	3. Sprint Development Drills 8 exercises x 30m	3. Technique Work Short Approach Jumps	3. Sprint Development Drills 8 exercises x 20m	3. General Strength Circuit - 12 exercises, 20' on/40' off	3. Sprint Development Drills 8 exercises x 30m	3. Sprint Development Drills 8 exercises x 40m	3.
Unit 3 Description	A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	15 x 6 Step Approach	A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	Push-ups, Prisoner Squats, Jack Knife, Back Hypers, Star Push-ups, Walking Lunges (2L, 2R), Alt. Side Lunges, Dive Bombers, Eagles, Burpees, Scorpions, Inchworm	A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	
Unit 4	4. Acceleration Work 5 x 10, 5 x 20 Crouch Start	4. General Strength Medicine Ball Routine 2 x 6 x 10	4. Acceleration Work 9 x 40m Hills	4. Cutdown 400m Barefoot Jog	4. Acceleration Work 3 x 10, 3 x 20, 3 x 30 Falling Starts	4. Extensive Tempo 2 x 5 x 200 @ 35"	4.
Unit 4 Description	Walk Back Recoveries	Around the World, Wood Choppers, Standing Russian Twist, Partner Figure 8, Partner Overhead Toss, Stup w/ toss	Walk Down Recoveries		Walk Back Recoveries	2 Recoveries b/wm reps, 5 b/wm sets	
Unit 5	5. Multijumps Baby Bounds	5. Cutdown Barefoot Walks - 1x20m each	5. Weight Training Olympics	5.	5. Multijumps Short Bounds	5. Weight Training Bodybuilding Circuit - 12x4 exercises, 90" recoveries	5.
Unit 5 Description	Left Leg FWD, Right Leg FWD, Left Leg Medial, Right Leg Medial, Left Leg Lateral, Right Leg Lateral (1 each x 10m, keep free leg in front)	Toes, Heels, Toes in, Heels in, Toes Out, Heels Out			SLJ x 4, STJ x 4, LLL... & RRL... x 3 each	Leg Curl, Twist Lunge (w/weight plate), Hyper (w/weight plate), St. Leg Deadlift, Bent Row, Lat. Pull (back), Bleep Curl, Military Press, Pullovers, Tricep, Leg Extension, Weighted Sit-up, Hanging Leg Lift, Seated Russian Twist (w/weight plate), Single Leg Curls, Standing Twist (w/weight plate), Upright Row, Lat Pull (front), Military Press, DB PFC Hps, Weight Y-up	
Unit 6	6. Weight Training Olympics	6. Weight Training Statics	6. Weight Training Statics	6.	6. Multithrows 4 x 3 exercises	6. Hurdle Mobility 1 x 6 Hurdles each exercise	6.
Unit 6 Description	Squat 5x6 @ 70% Bench 5x6 @ 70%	Front Squat 5x6 @ 70% Upright Rows 4x8 @ 60%	Front Squat 5x6 @ 70% Upright Rows 4x8 @ 60%		Hammer Hip (L&R), Overhead Back, B/wm Legs Forward	Right Leg Lead, Left Leg Lead, Full Steppers x 2	
Unit 7	7. Weight Training Statics	7. Hurdle Mobility 1 x 6 Hurdles, each exercise	7. Hurdle Mobility 1 x 6 Hurdles, each exercise	7.	7.	7.	7.
Unit 7 Description	Squat 5x6 @ 70% Bench 5x6 @ 70%		Full Steppers FWD, Full Steppers BWD, Lateral Knee Flexions (L&R), Lateral Knee Extensions (L&R), Over/Under (L&R)				
Unit 8	8. Multithrows 4 x 2 exercises	8.	8.	8.	8.	8.	8.
Unit 8 Description	Overhead Back, B/wm Legs Forward						

Appendix C

Proposed Training Week: Specific Preparation Phase

Microcycle Location:		Specific Pre-paration Phase							
Microcycle Number: 9		Microcycle Date: 10/30							
Session Number	Day	Session 1 Monday - Neutral	Session 2 Tuesday - General	Session 3 Wednesday - Neutral	Session 4 Thursday - General	Session 5 Friday - General	Session 6 Saturday - Extensive	Session 7 Sunday	
Unit 1 Description	Unit 1	1. Warmup Jog 400m 2. Dynamic Flexibility 5 exercises x 12 reps	1. Warmup Jog 800m 2. Dynamic Flexibility 6 exercises x 12 reps	1. Warmup Jog 400m 2. Dynamic Flexibility 5 exercises x 12 reps	1. Warmup Jog 800m 2. Weight Training Bodybuilding Circuit - 2x12 exercises, 80" recoveries Leg Curl, Twist Lunge (w/weight plate), Hyper (w/weight plate), Bent Row, Bicep Curl, Pullovers, Tricep, Leg Extension, Weighted Sit-up, Seated Russian Twist (w/weight plate), Upright Row, Lat Pull (front)	1. Warmup Jog 400m 2. Dynamic Flexibility 5 exercises x 12 reps	1. Warmup Jog 400m 2. Dynamic Flexibility 6 exercises x 12 reps	1. OFF	
Unit 2 Description	Unit 2	Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	Leg Curl, Twist Lunge (w/weight plate), Hyper (w/weight plate), Bent Row, Bicep Curl, Pullovers, Tricep, Leg Extension, Weighted Sit-up, Seated Russian Twist (w/weight plate), Upright Row, Lat Pull (front)	Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	Leg Swings (Side-to-side), Leg Swings (Front/Back), Donkey Kicks, Fire Hydrants, Eagles, Scorpions		
Unit 3	Unit 3	3. Sprint Development Drills 8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	3. General Strength Circuit - 12 exercises, 40" on/40" off Push-ups, Prisoner Squats, Jack Knife, Back Hoppers, Star Push-ups, Walking Lunges (2f, 2b), Alt. Side Lunges, Dive Bombers, Eagles, Burpees, Scorpions, Inchworm	3. Sprint Development Drills 8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	3. Sprint Development Drills 8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	3. Sprint Development Drills 8 exercises x 20m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	3. Sprint Development Drills 8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	3.	
Unit 4	Unit 4	4. Acceleration Work 3 x 20m, 3 x 30m Crouch Start, 3 x 40m 3pt Start Walk Back Recoveries	4. General Strength Medicine Ball Routine 6 x 10 Around the World, Wood Choppers, Standing Russian Twist, Partner Figure 8, Partner Overhead Toss, Sit-up w/ Toss	4. Full Approach Work 10 x Full Approach Done on tracks away from the runway to find marks.	4. Full Approach Work 10 x Full Approach Done on tracks away from the runway to find marks.	4. Technique Work Short Approach Jumps 15 x 8 Step Approach	4. Intensive Tempo 150m-200m-250m-200m-150m @ 80%	4.	
Unit 5	Unit 5	5. Multijumps Extended Bounds 6 x 30m Alt. Leg Bounds	5. Hurdle Mobility 2 x 6 Hurdles each exercise Right Leg Lead, Left Leg Lead, Full Stepovers x 2	5. Speed Development 3 x 80m Flying Runs 7 Recoveries btwn reps	5. Sprint Development Drills 8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Carioca (Left & Right), Lateral Bounds, Straight Leg Bounds	5. General Strength Circuit - Perform 5 sets, 20" Recoveries btwn exercises, 5" Recoveries btwn sets 1) Touch Squat w/ Press x 5, 2) Bent Knee Sit up x 10, 3) Lunge Walks x 5 each leg, 4) Seated Twist x 5 each side, 5) Low Box Step-ups x 5 each leg, 6) Glute Bridge x 5, 7) Prisoner Squat x 5	5. Hurdle Mobility 2 x 6 Hurdles each exercise	5.	
Unit 6	Unit 6	6. Weight Training Olympics Snatch 6x4 @ 65%	6. Cooldown Barefoot Walks - 1x20m each Toes, Heels, Toes in, Heels in, Toes Out, Heels Out	6. Weight Training Olympics Cleans 4, 4, 3, 2, 2 @ 70-80%	6. Cooldown 400m Barefoot Jog	6. Cooldown 400m Barefoot Jog	6.	6.	
Unit 7	Unit 7	7. Weight Training Statics Squat 5, 4, 4, 3, 3 @ 70-80% Bench 5, 4, 3, 2, 1 @ 80-100%	7. Weight Training Statics Lunges 3x4 (L&R) @ 75% DB Phys 3x6 @ 75%	7. Weight Training Statics Lunges 3x4 (L&R) @ 75% DB Phys 3x6 @ 75%	7.	7.	7.	7.	
Unit 8	Unit 8	8. Multithrows 3 x 3 exercises Double Hop DBH, Double Hop BLT, Squat Chest Pass	8. Multithrows 4 x 4 exercises Overhead Back, btwn Legs Forward, Hammer Hip (L&R), Squat Chest Pass	8. Multithrows 4 x 4 exercises Overhead Back, btwn Legs Forward, Hammer Hip (L&R), Squat Chest Pass	8.	8.	8.	8.	

Appendix D

Proposed Training Week: Pre-Competition Phase

Microcycle Location:		Pre-Competition Phase							
Session Number	Day	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	
		Monday - Neural	Tuesday - General	Wednesday - Neural	Thursday - General	Friday - Neural	Saturday - General	Sunday	
		1. Warmup Jog	1. Warmup Jog	1. Warmup Jog	1. Warmup Jog	1. Competition	1. Warmup Jog	1. OFF	
Unit 1 Description		400m	400m	400m	400m	Spring Break Opener Long Jump, 200m, 4x400m Relay	600m		
Unit 2 Description		5 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Side-to-side, Donkey Kicks, Leg Whips	6 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Side-to-side, Donkey Kicks, Leg Whips	5 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Side-to-side, Donkey Kicks, Leg Whips	6 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Side-to-side, Donkey Kicks, Leg Whips		2 sets x 6 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Side-to-side, Donkey Kicks, Leg Whips		
Unit 3 Description		8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Canoe (Left & Right), Lateral Bounces, Straight Leg Bounces	8 exercises x 20m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Canoe (Left & Right), Lateral Bounces, Straight Leg Bounces	8 exercises x 40m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Canoe (Left & Right), Lateral Bounces, Straight Leg Bounces	Medicine Ball Routine Around the World, Wood Choppers, Standing Russian Twist, Partner Figure 8, Partner Overhead Toss, Sit-up w/ Toss		Bodybuilding Circuit - 1x24 exercises, 90" Recoveries Leg Curl, Twist Lunge (w/weight plate), Hyper (w/weight plate), St. Leg Deadlift, Bent Row, Lat. Pull (back), Bicep Curl, Military Press, Pullovers, Tricep, Leg Extension, Weighted Sit-up, Hanging Leg-Lift, Seated Russian Twist (w/weight plate), Single Leg Curls, Standing Twist (w/weight plate), Upright Row, Lat Pull (front), Military Press, DB pec Flys, Weight Vup		
Unit 4 Description		4. Acceleration Work Block Starts 6 x 40m, 3' Recoveries	4. Technique Work Short Approach Jumps 12 x 10 Step Approach	4. Full Approach Work 12 x Full Approach Pop up into pit	4. Hurdle Mobility 1 x 6 Hurdles each exercise Lateral Left Leg Lead, Lateral Right Leg Lead, Over/Under Left Leg Lead, Over/Under Right Leg Lead				
Unit 5 Description		5. Multijumps Short bounds x3 each LLL, RRR, LRL, LRR...	5. General Strength Circuit - 12 exercises, 30' on/30' off Push-ups, Prisoner Squats, Jack Knife, Back Hyppers, Star Push-ups, Walking Lunges (2f, 2b), Alt. Side Lunges, Dive Bombers, Eagles, Burpees, Scorpions, Inchworm	5. Speed Endurance 2 x 150m @ 95% Full Recovery	5. Cool-down Preferred Modalities Static Stretching, Rollout Session, Athletic Training Room Modalities				
Unit 6 Description		6. Weight Training Olympics Cleans 3, 3.2, 2.1, 1 @ 90-100%	6. Hurdle Mobility 1 x 6 Hurdles each exercise Right Leg Lead, Left Leg Lead, Full Stepovers x 2	6. Weight Training Olympics Split Snatch 6M @ 60%	6. Hurdle Mobility Olympics				
Unit 7 Description		7. Weight Training Ballistics Lunge Jumps 5x4 (L&R) @ 25% BW Speed Bench 4x6 @ 25% BW	7. Weight Training Ballistics Squat Jumps 5x6 @ 15% BW Rep Jumps 5x6 @ 15% BW	7. Weight Training Ballistics 4 x 4 exercises	7. Hurdle Mobility Olympics				
Unit 8 Description		8. Multithrows Double Hop 5x6, Double Hop B.F. Squat Chest Pass	8. Multithrows Overhead Back, Blow Legs Forward, Hammer Hop (L&R), Squat Chest Pass	8. Multithrows 4 x 4 exercises	8. Multithrows Olympics				

Appendix E

Proposed Training Week: Competition Phase

Competition Phase							
Microcycle Location:	Microcycle Number: 36	Microcycle Date: 5/7					
Session Number	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	
Day	Monday - Neural	Tuesday - General	Wednesday - Neural	Thursday - General	Friday - Neural	Saturday - Neural	
Unit 1	1. Warmup Jog 400m	1. Warmup Jog 400m	1. Warmup Jog 400m	1. Warmup Jog 400m	1. Competition Outdoor Championships Day 2 Long Jump	1. Competition Outdoor Championships Day 2 Triple Jump, 4x400m Relay	1. OFF
Unit 1 Description							
Unit 2	2. Dynamic Flexibility	2. Dynamic Flexibility	2. Dynamic Flexibility	2. Dynamic Flexibility	2. Dynamic Flexibility	2. Dynamic Flexibility	2. Dynamic Flexibility
Unit 2 Description	5 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	6 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	5 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Leg Whips	6 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Trail Leg Circles, Donkey Kicks, Fire Hydrants, Eagles, Scorpions	6 exercises x 10 reps Leg Swings (Side-to-side), Leg Swings (Front/Back), Donkey Kicks, Fire Hydrants, Eagles, Scorpions		
Unit 3	3. Sprint Development Drills	3. General Strength	3. Sprint Development Drills	3. General Strength	3. General Strength	3. General Strength	3. General Strength
Unit 3 Description	8 exercises x 30m All Circuit - 10 exercises, 20' on/20' off	Crunches, Back Hips, Bicycle, Jack Knife, Skip, Side Shuffle (Left & Right), Canica (Left & Right), Lateral Bounces, Straight Leg Bounces, Right Side	8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Canica (Left & Right), Lateral Bounces, Straight Leg Bounces	8 exercises x 30m A Walk, A Skip, Backwards Walk, Backwards Skip, Side Shuffle (Left & Right), Canica (Left & Right), Lateral Bounces, Straight Leg Bounces	Medicine Ball Routine 6 x 10 Around the World, Wood Choppers, Standing Russian Twist, Partner Figure 8, Partner Overhead Toss, Sit-up w/ Toss		
Unit 4	4. Acceleration Work	4. Hurdle Mobility	4. Full Approach Work	4. Hurdle Mobility	4. Hurdle Mobility	4. Hurdle Mobility	4. Hurdle Mobility
Unit 4 Description	3 x 30m, 3 x 40m 3 Point Start, Walk Back Recovery	1 x 6 Hurdles each exercise Right Leg Lead, Left Leg Lead, Full Stepovers x 2	8 x Full Approach Pop up into Pit	1 x 6 Hurdles each exercise Lateral Left Leg Lead, Lateral Right Leg Lead, Over/Under Left Leg Lead, Over/Under Right Leg Lead	1 x 6 Hurdles each exercise Lateral Left Leg Lead, Lateral Right Leg Lead, Over/Under Left Leg Lead, Over/Under Right Leg Lead		
Unit 5	5. Weight Training	5. Cooldown	5. Weight Training	5. Cooldown	5. Cooldown	5. Cooldown	5. Cooldown
Unit 5 Description	Olympics Cleans 3x2 @ 70%	Preferred Modalities Static Stretching, Ballout Session, Athletic Training Room Modalities	Olympics Spilt Snatch 4x4 @ 60%	Preferred Modalities Static Stretching, Ballout Session, Athletic Training Room Modalities	Preferred Modalities Static Stretching, Ballout Session, Athletic Training Room Modalities		
Unit 6	6. Weight Training	6. Ballistics	6. Weight Training	6. Weight Training	6. Weight Training	6. Weight Training	6. Weight Training
Unit 6 Description	Lunge Jumps 5x4 (L&R) 15% BW Ballistics	Rep Jerks 4x6 @ 15% BW Ballistics	Ballistics	Ballistics	Ballistics		
Unit 7	7. Multithrows	7. Cooldown	7. Cooldown	7. Cooldown	7. Cooldown	7. Cooldown	7. Cooldown
Unit 7 Description	3 x 2 exercises Overhead Back, Btwm Legs Forward	Barefoot Walks - 3x20m each Toes In, Heels In, Toes Out, Heels Out					