Effects of a Run-Walk-Run Training Program on One Mile Time Trial Performance

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EFFECTS OF A RUN-WALK-RUN TRAINING PROGRAM ON ONE MILE TIME TRIAL PERFORMANCE

A Thesis Presented to the Graduate Faculty of Fort Hays State University in Partial Fulfillment of the Requirements for the Degree of Master of Science

by

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Bachelor of Science, Fort Hays State University

Date May 20, 2021

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Approved
Dr. Justin Greenleaf
Committee Member
ABSTRACT

The purpose of this study was to describe the change in performance on a timed one-mile run-walk-run, following training in the Galloway Run Walk Run Training Method (GRWRTM). Operational procedures, data collection, and deidentification were performed by the GRWRTM program director prior to inclusion of this study. Over the span of multiple iterations, 42 (28 female and 14 male) participants met the qualifying criterion of performing the post-training, time trial 7, 14, or 21 days after initial testing. Descriptive statistics and t-tests for paired two sample means were performed on 1) all participants, 2) male participants, 3) female participants, 4) all participants with testing dates 7 days apart, 5) all participants with testing dates 14 days apart, and 6) all participants with testing dates 21 days apart. Level of significance was evaluated at p<.05. The results showed a significant direction towards improvement for all hypotheses, except hypothesis 4) all participants with testing dates 7 days apart. The average improvement for all participants, across all testing dates, was 22.53 seconds. These results indicate that the GRWRTM protocol may have potential as a novice style racing approach for performance optimization.
ACKNOWLEDGEMENTS

I would not have successfully completed this project without the guidance, support and patience of various people. Firstly, I would like to thank Dr. Gregory Kandt for his supervision and faith in me throughout this project. Your knowledge of the research process and the field of Exercise Science is inspirational. Thank you for your faith in my knowledge and ability to solve challenges. You provided me the opportunity to grow in many ways throughout this experience.

I would also like to show gratitude to my committee, including Dr. Gregory Kandt, Dr. Steve Sedbrook, Dr. Lynn Maska, and Dr. Justin Greenleaf. Thank you for your interest, time, and flexibility. I grant my special thanks to Ronald “J” Jenkins, Director of the Lawrence, Galloway Run Walk Run program. Your program is the inspiration for this entire project. This study would not have been possible without your pristine records and enthusiasm for exploration. Lastly, I would like to thank my friends and family, especially my parents, Mark and Rachelle Turpin. I am forever grateful for all of the people who showed unconditional love and encouragement throughout this process. This thesis stands as a testament to my amazing support team. Thank you.
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INTRODUCTION

The utilization of run-walk intervals has been practiced as a novice training protocol throughout running history. However, it is the Jeff Galloway Run Walk Run Training Method (GRWRTM) that has brought popularity and acceptance to the run-walk protocol for all types of runners. Today, more than 300,000 runners of all ages and abilities are participating in GRWRTM groups across the United States. Jeff Galloway speaks at 200+ running and fitness engagements per year, has authored ten books, and is published in numerous running magazines including Runner’s World (Galloway, 2016).

Following participation in 1972 Olympics, Jeff Galloway set out to create an injury-free marathon training program that was accessible to most individuals. In 1978, Runner’s World published the protocol for a low mileage, three-day a week, Galloway Run Walk Run Program (Galloway, 2016). This program became the foundation for what is known today as the Galloway Run Walk Run Training Method.

The GRWRTM uses strategic walk intervals during bouts of continuous running to ease fatigue during training and racing. These run to walk intervals are established through a pre-training, one mile time trial, termed the Magic Mile (MM). Following the MM, each participant is provided an individualized run-walk ratio and training program. Participants are highly encouraged to attend formal practice times, become involved in group events, and enjoy the comradery of belonging to team (Galloway, 2016).

According to Galloway, 98% of participants who adhere to the GRWRTM protocol and conservatively modify for special events such as heat or wind, will complete their target event injury-free (Galloway, 2016). This is attributed to the individualized ratio of running to walking that can be modified daily. The intermittent walk breaks are designed to extend time to fatigue,
reduce injury, reduce core body temperature increase, increase willingness to participate, and to allow runners of all levels to enjoy the mood boosting effects of exercise.

**Problem Statement**

The purpose of this study is to describe the change in a timed one-mile run-walk-run, following training in the Galloway Run Walk Run protocol.

**Sub Problems**

Under the Main Problem of this study, the following sub-problems were investigated:

1. The change in one mile, run-walk-run time for all participants, following training in the Galloway Run-Walk-Run Training Method protocol.
2. The change in one mile, run-walk-run time for male participants, following training in the Galloway Run-Walk-Run Training Method protocol.
3. The change in one mile, run-walk-run time for female participants, following training in the Galloway Run-Walk-Run Training Method protocol.
4. The change in one mile, run-walk-run time for all participants, following training in the Galloway Run Walk Run Training Method protocol, with pre and post-trial dates 7 days apart.
5. The change in one mile, run-walk-run time for all participants, following training in the Galloway Run Walk Run Training Method protocol, with pre and post-trial dates 14 days apart.
6. The change in one mile, run-walk-run time for all participants, following training in the Galloway Run Walk Run Training Method protocol, with pre and post-trial dates 21 days apart.
Definition of Terms

The following definitions of terms were established for the implementation of this study and will be used throughout and within the scope of the study.

**Active Recovery.** A type of activity that consists of low intensity movement such as walking between bouts of high intensity movement such as running (Zickl, 2018).

**Cardiovascular drift (CV-Drift).** A gradual increase in heart rate despite constant load exercise. It is generally associated with heat accumulation and plasma loss (Heart, 2020).

**Cardiovascular endurance.** The “body’s ability to continue exertion while getting energy from the aerobic system used to supply the body with energy” (Sinicki, 2009).

**Central fatigue.** References events occurring in the neurotransmitter system regarding the brain and spinal cord (Central and Peripheral Fatigue, n.d.).

**Galloway Run-Walk-Run Training/Racing Method.** A training/racing method that uses strategic run to walk intervals (Galloway, 2016).

**High intensity aerobic activity.** Activity in which the participant reaches a heart rate of 85%-110% of VO2max (Hamilton, n.d.).

**Interval training.** Targeted at improving the lactate system in order to sustain a high intensity effort. Interval intensities are performed at 85%-110% of VO2max (Hamilton, n.d.).

**Law of Compensation.** “When your movement meets restrictions and you continue to apply force, that force will transfer to the next available point of least resistance (Taylor, 2016).”

**Marathon.** “A footrace run on an open course usually of 26 miles 385 yards (42.2 kilometers) (Marathon, n.d.).”
Magic mile/one-mile run-walk run. A 1600 meter or one mile time trial used to establish a participants current fitness level and an indicator of the appropriate Run Walk Run strategy (Galloway, 2016).

Moderate intensity aerobic activity. Activity in which the individual maintains a heart rate between 64% and 75% of his/her maximum heart rate (2020).

Muscular endurance- The muscle’s ability “to repeatedly exert force against resistance. Performing multiple repetitions of an exercise is a form of muscular endurance as are running and swimming (Brown, 2019).”

Novice Runner. “A person who had not been running on a regular basis for the past year (Nielsen, Ronnow, Rasmussen, Lind, 2014).

Weak link.“The muscle, joint, tendon, etc. that takes more stress due to the individual’s range of motion, body structure, type of workout, etc. (Galloway, 2016).”

Moderate intensity aerobic activity. Activity in which the individual maintains a heart rate between 64% and 75% of his/her maximum heart rate (2020).

Parasympathetic nervous system. Part of the autonomic nervous system that slows the stress response (Functions of the Autonomic Nervous System, n.d.).

Passive recovery. A type of recovery consisting of complete rest between bouts of activity (Dalleck, n.d.).

Peripheral fatigue. Changes in the motor units of the muscle due to a lack of energy resources and accumulation of waste product (Central and Peripheral Fatigue, n.d.).

Physiological fatigue, “The loss of force producing capacity as a result of exercise (Central and Peripheral Fatigue, n.d.).”

Stroke Volume. The amount of blood pumped with each heart beat (Heart, 2020).
**Sympathetic nervous system.** Part of the autonomic nervous system that initiates the stress response (Functions of the Autonomic Nervous System, n.d.).

**VO2max.** An index measurement of the “limits to the cardiorespiratory systems’ ability to transport oxygen from the air to the tissues at a given level of physical conditioning and oxygen availability (Hawkins, Raven, Stray-Gundersen, & Levine, 2007).

**Delimitations**

This study was delimited to individuals who had signed up to participate in a GRWRTM program prior to inclusion in this study. These subjects used the run-walk-run intervals as directed by the GRWRTM program director. There were no limitations on demographic or socioeconomic status.

**Limitations**

This study could be limited by inconsistency of weather between test days. The participants may have varied considerably in training history and racing experience. All time trials were timed using a hand operated stopwatch which is not as sensitive and specific as automatic timing systems. The Galloway Run-Walk-Run Training Method Program Director’s understanding of program implementation and protocol improved with each iteration of the training program.

**Assumptions**

It was assumed that all subjects exerted maximal effort during testing. It was also assumed the subjects adhered to their identified run-walk-run intervals and possessed at least the minimal levels of fitness necessary to participate in the GRWRTM. It was also assumed that the tests were administered objectively, and all data collected was reliable.

**Null Hypothesis**
The null hypotheses tested at the .05 significance level are as follows:

1. There will be no change in one mile, run-walk-run time for all participants, following training in the Galloway Run-Walk-Run protocol.

2. There will be no change in one mile, run-walk-run time for male participants, following training in the Galloway Run-Walk-Run protocol.

3. There will be no change in one mile, run-walk-run time for female participants, following training in the Galloway Run-Walk-Run protocol.

4. There will be no change in one mile, run-walk-run time for all participants, following training in the Galloway Run Walk Run protocol, with pre and post-trial dates 7 days apart.

5. There will be no change in one mile, run-walk-run time for all participants, following training in the Galloway Run Walk Run protocol, with pre and post-trial dates 14 days apart.

6. There will be no change in one mile, run-walk-run time for all participants, following training in the Galloway Run Walk Run protocol, with pre and post-trial dates 21 days apart.

Significance of Study

Over 300,000 runners of all ages and abilities have participated in GRWRTM programs across the United States. Jeff Galloway speaks at over 200 running and fitness engagements per year, has authored ten books, and is published frequently in popular fitness and running magazines such as Runner’s World. The “Galloway Method,” has become one of, if not the most recognizable training plans for novice runners. Despite these high levels of popularity, no previous research has been conducted regarding the GRWRTM (Galloway, 2016).
Runners of all levels seek to mitigate the effects of fatigue and optimize performance. This is especially difficult for novice runners or those who are returning to the sport. Success is largely dependent on program/racing design. The GRWRTM may provide an accessible approach for this type of runner. By alternating between moderate intensity running bouts and recovery bouts, this method may reduce physiological fatigue and allow participants to train/race more efficiently. The purpose of this review is to discuss the GRWRTM as a program design/racing approach for novice runners. This method may have potential to extend time to fatigue, reduce injury, reduce core body temperature increase, increase willingness to participate, and may allow participants to enjoy the mood boosting effects of exercise.

**Moderate Intensity Intermittent Running**

The Galloway Run-Walk-Run Training/Racing Method involves repeated bouts of running followed by periods of walking. Within this protocol, walking time is considered active recovery while run time is considered a working bout. It is important to note that the moderate intensity intermittent running is not a form of interval training. Interval training is targeted at improving the lactate system in order to sustain a high intensity effort for a longer duration. Interval intensities are performed at 85%-110% of VO2max (Hamilton, n.d.). Moderate intensity intermittent exercise (MITT) is aimed at maximizing time at stroke volume max-building endurance such as cycling at 60% of VO2max in each interval (Colakoglu, Ozkaya, & Blaci, 2018). Working at 60% VO2max with intermittent breaks becomes a very similar model to the Galloway Run Walk Run Training Method. GRWRTM participants are instructed to follow the “huff and puff” rule. The “huff and puff” rule advises participants to reduce speed if they find
their breathing becoming strained (Galloway, 2016). For the purpose of this study, we can assume that the “huff and puff” rule keeps participants within 60%-75% of their VO2max, which correlates with a moderate intensity workload (Dalleck, n.d.). Additionally, the GRWRTM uses bouts of walking which are designed to aid in metabolic waste removal and increase oxygenated blood flow to the muscle (2021). By alternating between moderate intensity workloads and recovery bouts, novice individuals may maximize the intended design of constant-load training sessions and receive optimal physiological adaptations.

Recovery

Exercise-induced muscle fatigue can last from a few minutes to a few days and can determine the quality of the subsequent training sessions. Athletes of every level seek mitigating factors to fatigue. A proper training program should consider type, frequency, intensity, and time of a recovery (Dalleck, n.d.).

Typically, there are two types of recovery: passive and active. Passive recovery refers to resting between bouts of activity, such as sitting on the ledge of the pool between laps. A low intensity bout performed between higher intensity bouts is consider active recovery (2021) such as the GRWRTM. Active recovery can be performed during higher intensity training sessions or as a standalone activity such as cross training.

Frequency of recovery refers to the number of hours/days allotted for recovery. Frequency of recovery can range from hours to weeks. Professional athletes often train in microcycles, which may include several weeks of recovery between competition seasons (Dalleck, n.d.). The GRWRTM advocates for two easy days or non-running days after every hard training day and a minimum of three training days each week. However, participants are
encouraged to find the most appropriate work to recovery ratio for their own body (Galloway, 2002).

Intensity of recovery refers to the reduction in workload. Recovery intensity should be substantially lower than working intensity. The American Council on Exercise, has reported exercise intensities below 50% of VO2max (low intensity training) to be optimal for the decreasing lactate and proton levels in interval sessions (Dalleck, n.d.). Of note, this report was based on research focusing on high intensity interval training (workloads at 85%-110% of VO2max) (Dalleck, n.d.) whereas the GRWRTM utilizes MITT (60%-75% of VO2max).

Despite the disparity in exercise modality, low intensity exercise such as walking should provide an adequate decrease in intensity to constitute a recovery intensity.

Recovery time is a reference to either the duration of an entire recovery session or to the recovery time between working bouts (2021). Time of recovery, is dependent on the intention of the training or resting session. For example, an athlete working to improve anaerobic speed may perform a series of 60m, 40m, 20m sprints. For this type of training, the athlete will recover to 60% of his/her maximum heart rate. Recovery heart rate between intervals would be calculated by: (220-age) x .60 (Pasquale, 2019). In application, experienced sprinters rarely use heart rate monitors as they are familiar with the physiological markers that indicate ideal recovery has occurred.

The GRWRTM utilizes a hybrid approach to recovery between MITT sessions. The Magic Mile time trial performed at the beginning of the program, is used to predict best potential race outcome and to calculate training speed and recovery ratios. Participants are encouraged to use the predicted best potential chart to determine the corresponding pace and then correct ratio for each training run with an intuitively conservative adjustment. Like recovery periods for the
above sprinter, Galloway suggests runners make educated adjustments to training paces based on the way he/she is feeling on that given day. For example, a participant who ran 9:00 in the MM time trial would run approximately 11:30 pace for a 14 mile run, using between 2:30-:45 minutes of running with :60 seconds of walk break. Table 1 displays the GRWRTM predicted best potential per mile. Table 2 shows the corresponding run-walk-run ratios for training paces.

Table 1

<table>
<thead>
<tr>
<th>Race Distance</th>
<th>Adjustment to MM</th>
</tr>
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<tbody>
<tr>
<td>5k</td>
<td>+:33 seconds</td>
</tr>
<tr>
<td>10k</td>
<td>Multiple by 1.15</td>
</tr>
<tr>
<td>Half Marathon</td>
<td>Multiple by 1.2</td>
</tr>
<tr>
<td>Marathon</td>
<td>Multiple by 1.3</td>
</tr>
</tbody>
</table>


Table 2

<table>
<thead>
<tr>
<th>Run-Walk-Run Ratios for Training Pace Used*</th>
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<tbody>
<tr>
<td>8 min/mi</td>
</tr>
<tr>
<td>Run 4:00 min/walk :35 seconds</td>
</tr>
<tr>
<td>9 min/mi</td>
</tr>
<tr>
<td>4/1</td>
</tr>
<tr>
<td>10 min/mi</td>
</tr>
<tr>
<td>3/1</td>
</tr>
<tr>
<td>11 min/mi</td>
</tr>
<tr>
<td>2:30/1</td>
</tr>
<tr>
<td>12 min/mi</td>
</tr>
<tr>
<td>2/1</td>
</tr>
</tbody>
</table>
Physiological Factors

Physiological fatigue, “the loss of force producing capacity as a result of exercise,” is caused by either or both central or peripheral fatigue (Central and Peripheral Fatigue, n.d.). Central fatigue references events occurring in the neurotransmitter systems regarding spinal cord and brain. The brain becomes overheated, due to core body temperature increases during prolonged exercise. When central fatigue occurs, the brain reduces signals to the muscle for activation. This results in reduced muscular force, general body fatigue, tiredness, loss of drive, and even sleepiness. Peripheral fatigue, references internal changes in the motor units of the muscle during exercise. When peripheral fatigue occurs muscular force decreases due to a lack of energy resources and the accumulation of waste product within the muscle- often described as a “burning sensation.” (Central and Peripheral Fatigue, n.d.).

Peripheral fatigue and injury reduction

The GRWRTM may aid in reducing peripheral fatigue by alternating the use of the muscle in two different ways (running and walking/shuffling). The prime movers are able to recover before the next movement bout. This period of recovery allows the muscle to remove waste products, replenish energy stores, and repair muscular damage. This allows the muscle to work longer, feel better, and have a reduced risk for injury (Galloway, n.d.).

<table>
<thead>
<tr>
<th>13 min/mi</th>
<th>1/1</th>
</tr>
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<tr>
<td>14 min/mi</td>
<td>:30/:30</td>
</tr>
<tr>
<td>15 min/mi</td>
<td>:30/:45</td>
</tr>
<tr>
<td>16 min/mi</td>
<td>:30/:60</td>
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</table>

Each year, between “37% and 56% of recreational runners who steadily train and participate in a long distance run periodically will sustain a running-related injury” (Gallo, Plakke, & Silvis, 2012). According to Galloway, running related injuries occur in areas of the body that are associated with a “weak link- the muscle, joint, tendon, etc. that takes more stress due to the individual’s range of motion, body structure, type of workout, etc.” (Galloway, 2016). The “weak link” areas first become irritated, then micro damage occurs which later develops into injury. During continuous running, pain-killing hormones, such as endorphins will disguise the early warning signs of irritation and possibly more serious damage. The Law of Compensation states, “When your movement meets restrictions and you continue to apply force, that force will transfer to the next available point of least resistance (Taylor, 2016).” Most often, the point of least resistance cannot hold the applied force and injury occurs. Injury is common when the body is placed under new or more extreme stressors such as long runs and/or speed workouts and/or during the last third of a training session when the body is fatigued. Galloway advocates for walk breaks, early and often to “reduce the continuous buildup of stress on the weak links” (Galloway, 2016). Walking early in the training sessions allows runners the space to recognize and address the early signs of irritation before injury occurs. According to Jenny Hadfield, running coach and co-author of Marathoning for Mortals, walk breaks “reduce the impact forces on the muscles, joints, and tendons” (Sloan, 2013). A study by Hottenrott, et al., concluded that non-elite runners could achieve similar race finish times using a strategic run-walk-run protocol compared to a continuous running protocol. While using the run-walk-run protocol, subjects reported less musculoskeletal discomfort (Hottenrott, et al., 2014). Although supportive research on injury reduction using walk breaks is limited, there is “a lot of common sense in it,” according to David Martin, exercise physiology professor at Georgia State University and chairman of sports science
for USA Track and Field (Parker-Pope, n.d.). Walk/shuffle breaks early and frequently extend the time to muscular fatigue so that the prime movers are efficient and the secondary systems or “back-up” muscles stay in reserve much longer which reduces the risk of injury (Galloway, 2016).

**Central Fatigue and Core Body Temperature**

During bouts of steady state running, individuals experience a phenomenon known as cardiovascular drift (CV-Drift). As an individual begins his/her run, the sympathetic nervous system triggers an increase in heart rate. This is the body’s response to the increased need for oxygen rich blood that is required to move at a higher effort. Initially stroke volume (the amount of blood pumped with each beat) increases. Then the parasympathetic nervous system adjusts the heart rate to match the oxygen needs for sustained pace. However, if the individual continues to maintain the same pace, heart rate will gradually increase over time. This is CV-Drift. CV-Drift usually occurs between 10 and 15 minutes of steady state running (constant-load, prolonged moderate to moderate-heavy exercise). The most widely accepted explanation for CV-Drift is associated with heat accumulation in the body and plasma loss (Heart, 2020).

During constant-load running, core body temperature increases- approximately 80% of energy produced in the muscle cells is converted to heat energy while only approximately 20% is used for muscle contraction (Vella & Kravitz, n.d.). To releases the excessive heat, blood is directed to the skin, which alters the regulation of the heart, ultimately “drifting” the heart rate upward. As core temperature and heart rate increase, the individual’s hydration levels decrease and the heart regulatory system is stressed even further (Hamilton, n.d.). Continued constant-load running without intervention may eventually lead to a forced reduction in pace, dehydration, loss of a desire to run, longer time to recover, or even heat illness or injury.
As the human body perspires, sweat evaporates off the skin which releases excessive heat caused by muscle contraction. This system helps keep the body in homeostasis. However, as activity continues, unreplaced fluid loss may result in dehydration. Dehydration results in decreased perspiration, increased core temperature, decreased stroke volume, and ultimately increased CV-Drift. In addition, dehydration decreases blood plasma volume. Blood plasma consisting of 91-92% water and 8-9% solids, is critical for the transport of oxygen, nutrients, hormones, proteins, and waste. When plasma volume decreases, stroke volume decreases and heart rate increases (Heart, 2020).

The GRWRTM may inherently provide increased opportunity for mitigating dehydration. By the nature of walk breaks participants are more likely to consume fluids at more frequent increments. Additionally, formal training groups are encouraged to participate in the Galloway Hydration Program. This program suggests consuming at least 8 ounces of water, every hour, before and after exercise (but no more than 20 ounces in one single hour) and 2-4 ounces of water every two miles (H). Through the use an effective hydration program, participants may reduce core body temperature increases and decrease cardiovascular drift resulting in increased performance.

The intention of a constant-load training session is to increase capillary density, efficiency of fat oxidization, and to build endurance through maximizing time spent at stroke-volume max. Time spent at stroke-volume max may be one of the most important acute training effects for increasing endurance performance. However, as discussed above CV-Drift occurs at approximately 10-15 minutes of constant-load running. As the heart rate increases, stroke volume decreases by up to 20% compared to the initial 10-15 minutes of training. Therefore during a 60 minute constant-load training session, the individual only receives maximal training.
benefits during the first 10-15 minutes, while the remaining 45-50 are spent receiving reduced intervention benefits. This knowledge of CV-Drift, would then theoretically allow coaches and staff to modify constant-load training sessions to maximize total time spent at max stroke volume (Hamilton, n.d.).

A study by Colakoglu, Ozkaya, and Balci found that moderate intensity intermittent exercise may reduce cardiovascular drift, increase time spent at maximum stroke volume and ultimately improve endurance performance. Seven well-trained male cyclists participated in two, 30 minute, cycling trials on an ergometer. Intensity was set to 60% of each cyclists maximum aerobic capacity (VO2max). In one session, the cyclists constant-load rode at 60% of VO2max for thirty minutes. In the second session, the cyclists performed three, 10-minute bouts at 60% (VO2max), with five minutes of passive recovery. Oxygen consumption, cardiac output, and maximum stroke volume responses were assessed using a nitrous-oxide re-breathing system. The two trials were compared using a greater than 5% stroke volume decrease, with accompanying hear rate increase, while total cardiac output remained stable. During the constant-load trial, progressively decreasing stroke volume was present at the mean time of 12 minutes. Reduced stroke volume was accompanied by an increase in heart rate, while cardiac output remained stable through the 30 minute trial, presenting CV-Drift. During the three by 10-minute trial, small declines in stroke volume were present. However, the intermittent exercise trial produced a greater total average stroke volume response of 145mls per beat compared to 140mls per beat during the constant-load trial. Additionally the intermittent trial accumulated 10.0 minutes at maximum stroke volume, while the constant-load trial spent 1.5 minutes at maximum stroke volume. The study concluded, that moderate intensity (60% of VO2max) intermittent exercise
repetitions of less than 10 minutes may improve cardiac adaptation and athletic performance (Colakoglu, Ozkaya, & Blaci, 2018).

**Willingness to Participate**

The United States physical activity guidelines provided by the Center for Disease Control, recommends that adults participate in a minimum of 150 minutes of moderate intensity aerobic activity and participate in muscle strengthening activity at least two days per week (2020). Despite these guidelines and the recognized benefits of physical activity, many people do not maintain a consistent exercise regimen. Intolerability or lack of enjoyment is one possible explanation for the high rates of inactivity.

Individuals avoid activities which they find adverse. Aversion increases as individuals increase intensity above ventilatory threshold. “Continuous bouts of vigorous-intensity exercise, such as cycling at ~80% VO2max for 30 minutes, provokes a greater psychological distress, less enjoyment and higher feelings of displeasure as compared to moderate-intensity cycling at 50% of VO2max for 60 minutes” (Jung, Bourne, and Little, n.d.). Many new or previously injured runners are discouraged from participation due to the psychological conditions associated with running. These individuals become discouraged before reaching the recommended 30-60 minutes of activity and may receive only a limited amount of cardiovascular benefit (Zuhl and Kravitz, n.d.).

A run-walk-run method may mitigate some aversion to endurance activity by alternating between 60-75% VO2max and 50% of VO2max during the run-walk bouts. Previous research suggests lower intensity activity increases pleasurably (Jung, Bourne, and Little, n.d.), extends time of activity, and ultimately provides equitable endurance benefits (Gannoe, 2015). In a study by Gunnarsrsson and Bangsbo (2012), 18 moderately trained subjects completed a seven-week
intervention program utilizing a 10-20-30 training protocol. During the intervention period, all training sessions were replaced with sessions of 10-20-30-second bouts of low (<30% perceived effort), moderate (<60% perceived effort), and high-intensity (>90% perceived effort) running respectively. Subjects completed three or four 10-20-30- second bouts for five minutes with two minutes of recovery between bouts. The intervention group reduced overall training volume by 54% while the control continued normal training. Following completion of the intervention period, an average maximal oxygen consumption (VO2 Max) in the intervention group increased by 4% (p<0.05) despite a 54% reduction in total training volume. No VO2 max change was observed in the control (Gunnasrsson and Bangsbo, 2012). This method of alternating between running and walking may allow individuals to participate in activity for shorter durations while receiving equitable psychological benefits. It may be speculated that moderate intensity intermittent exercise such as the Galloway Run-Walk-Run method, may satisfy the “pleasurable” consideration in willingness to participate while also producing psychological benefits of steady state activity.

**Mood Boosting Effects**

Individuals may also become more inclined to participate if expecting beneficial emotional effects. Galloway explains, the body produces endorphins with the anticipation of the pain associated with running. When the body runs continuously it utilizes these endorphins to reduce muscle discomfort and improve the runner’s mood. However, if you take walk breaks, the endorphins are not needed to relieve muscular discomfort and greater amounts are received by the psyche, thus boosting the mood even more (Galloway, 2017). Many studies have documented that physical activity, specifically running, has beneficial effects on promoting a positive attitude and lowering depression. The study, “Marathon running improves mood and negative affect,”
concluded that marathon runners “show fewer depressive symptoms compared to sedentary controls (Roeh et al., 2020) and that those running more than 150 minutes per week have the lowest depressive symptoms. In addition, negative effects are reduced even further for the 24 hours directly following a marathon race (Roeh et al., 2020)
METHODS AND PROCEDURES

Introduction

The focus of this investigation was to describe the change in a timed one mile run-walk-run, following training the Galloway Run-Walk-Run Training Method. Subjects were all participants in a community-based race preparation training program. This investigation specifically describes the change in the one mile, run-walk-run time for (1) all participants (2) male participants, (3) female participants, (4) all participants with pre and post-trial dates 7 days apart, (5) all participants with pre and post-trial dates 14 days apart, and (6) all participants with pre and post-trial dates 21 days apart. The methods will include preliminary procedures of: (a) selection of participants, (b) instrumentation, (c) instrumentation validity and reliability. Operational procedures will include: (a) participant orientation, (b) test administration, (c) research design and data collection.

Preliminary Procedures

Participants. Subjects were participants in a community-based race preparation training program. This is an ongoing training program supplied by a community outreach director/co-owner of a local running store. All subjects voluntarily participated in various iterations of Galloway Run-Walk-Run Training groups. The GRWRTM program director previously collected data from multiple participants. 48 (14 male and 28 female) participants fit the criteria of 7, 14, 21 days between initial and second testing.

There are no limiting factors or specific populations targeted. However due to the nature of a novice style-training program, most participants are inherently novice runners. For the purpose of this study, participants below the age of 18 and above the age of 65 were not
included in data collection to avoid protected vulnerable populations. Participant recruitment was not applicable for this study.

**Instrumentation.** The Galloway Run-Walk-Run Training Method Program utilizes a timed, one-mile trial termed, the “Magic Mile,” to monitor participant progress. The Magic Mile was performed prior to program participation and repeated after training in the run-walk-run protocol (7-21 days later). The MM was performed on a standard 400m outdoor track. The track location varied between testing groups due to availability. However, every 400m outdoor track is standardized. The Magic Mile pre- and post- training trial times were examined and the effects were described.

**Instrumentation validity and reliability.** At this time, the validity and reliability of the Magic Mile have not been formally determined. Validity and reliability of the Magic Mile may be inferred because they have been established for a variety of similar distance or time-based tests. Examples of these tests include: the one-mile walk, the one-mile run, the 1.5-mile run, the one-mile walk/run, the 6 minute walk, and the 12 minute run.

**Operational Procedures**

All operational procedures were performed by the GRWRTM program director. The director administered the Magic Mile over several iterations, following the protocol described in *The Run-Walk-Run Method*, by Jeff Galloway. This protocol is described below.

**Participant orientation.** Prior to participation in a GRWRTM training group, all participants were informed of the risks associated with participation in an introductory running program and were asked to sign a waiver of consent (Appendix A).

**Test Administration.** Participants were instructed in a five-minute warm-up, using the run-walk strategy. This included instruction on the appropriate run to walk ratio for the warm-up
period. The run-walk ratio was to be more conservative than the anticipated MM strategy. For example, a participant who plans to use a 3-minute run/1-minute walk in the MM, would then use a warm-up ratio closer to one minute of running with one minute of walking, or 30 seconds/30 seconds (Galloway, 2016).

Each participant was instructed in proper “acceleration glider technique.” Following a short trial period, each participated performed three to four acceleration gliders. An acceleration glider teaches participants to “glide, or coast off momentum directly into a walk break” (Galloway, 2016). To complete an acceleration glider, participants walk for 30 seconds, ease into a shuffle for 8-10 steps, ease into a slow jog for 8-10 steps, and then transition into an easy pace, which is held for 30 steps. This pace is slower than the anticipated MM pace (approximately 5k race pace). Participants then “glide or coast”- a gradual reduction in speed to a shuffle, for 10-15 steps, followed by a glide to a walk.

Following the warm-up and acceleration gliders, participants performed the Magic Mile. They are instructed to “keep a consistent pace for the first three quarters with a slightly faster last lap” (Galloway, 2016). Participants are encouraged to “insert a 15-30 second walk break every half lap or every lap or at least at the half mile” (Galloway, 2016).

Following the MM, participants are instructed to jog/walk for 10 minutes and then walk for 5-10 minutes.

The Magic Mile time trial is performed at the onset of training and is repeated 7, 14, or 21 days later. With each consecutive trial, participants are encouraged achieve a faster overall time. For the purpose of this study, only the first- and second-MM data will be investigated and described.
Research Design and Data Collection. This study used a retrospective descriptive analysis of a convenience sample including a one-group pretest-posttest design. It describes the change in a timed one-mile run-walk-run, following training in the Galloway Run Walk Run protocol. All testing and data collection occurred prior to the development of this study. The study is observing whether any change in performance has occurred, but does not confirm why the change, if any has occurred. Dependent sample t-tests were used to evaluate the mean difference between pre- and post- observation of (1) all participants (2) male participants (3) female participants (4) all participants with pre and post-trial dates 7 days apart (5) all participants with pre and post-trial dates 14 days apart and (6) all participants with pre and post-trial dates 21 days apart.
RESULTS

The purpose of this study was to examine the change in a timed one-mile run-walk-run test following training in the Galloway Run Walk Run protocol. All testing and data collection was conducted by the Galloway Run Walk Run program director, deidentified, and provided to the principal investigator of this study. Over the span of multiple iterations, 42 (28 female and 14 male) participants met the qualifying criteria to perform the pre-training time trail and the post-training time trial 7, 14, or 21 days after initial testing. Testing occurred on a 400m standardized track. Descriptive statistics were obtained, and a series of dependent t-tests were used to analyze the data. The alpha level was set at the .05 significance level for all tests. Data and results are reported in Tables 3-9 and Figure 1 below.

Results

Table 3

Descriptive Data

<table>
<thead>
<tr>
<th></th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
<th>Change Mean</th>
<th>Change SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>680.95</td>
<td>119.62</td>
<td>658.43</td>
<td>123.39</td>
<td>-22.52</td>
<td>3.77</td>
<td>42</td>
</tr>
<tr>
<td>MALE</td>
<td>615.36</td>
<td>615.36</td>
<td>597.86</td>
<td>597.86</td>
<td>-17.50</td>
<td>15.38</td>
<td>14</td>
</tr>
<tr>
<td>FEMALE</td>
<td>713.75</td>
<td>95.22</td>
<td>688.71</td>
<td>93.69</td>
<td>-25.04</td>
<td>1.54</td>
<td>28</td>
</tr>
<tr>
<td>7-DAY GROUP</td>
<td>659.75</td>
<td>120.99</td>
<td>651.67</td>
<td>133.61</td>
<td>-8.08</td>
<td>12.62</td>
<td>24</td>
</tr>
<tr>
<td>14-DAY GROUP</td>
<td>772.33</td>
<td>101.47</td>
<td>734.67</td>
<td>85.31</td>
<td>-37.67</td>
<td>16.16</td>
<td>6</td>
</tr>
<tr>
<td>21-DAY GROUP</td>
<td>677.67</td>
<td>111.81</td>
<td>633.83</td>
<td>110.38</td>
<td>-43.83</td>
<td>1.43</td>
<td>12</td>
</tr>
</tbody>
</table>
The descriptive data (Table 3) indicated a general time reduction from the pre to post-test sessions for all groups. This implies a change in the direction of improvement after the training in the Galloway Run Walk Run protocol. (1) All participants combined had a difference of 22.53 seconds, (2) male participants a difference of 17.5 seconds, (3) female participants a difference of 25.04 seconds, (4) all participants who tested dates 7 days apart displayed a difference of 8.08 seconds, (5) all participants who tested dates 14 days apart displayed a difference of 37.67 seconds, and (6) all participants who tested dates 21 days apart displayed a difference of 43.83 seconds.

Table 4

*Results of Dependent T-Test: ALL participants*

<table>
<thead>
<tr>
<th>Group</th>
<th>MD</th>
<th>N</th>
<th>SE</th>
<th>t-critical</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL PRE vs POST</td>
<td>22.52</td>
<td>42</td>
<td>0.53</td>
<td>1.68</td>
<td>3.77</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

**Hypothesis 1.** (Table 4) There was a significant difference between the Pre-test and Post-Test \[t(42) = (3.77), p < .001\]. The Post-Test one mile, run-walk-run time was statistically faster following the training in the Galloway Run-Walk-Run protocol than the Pre-test for the collective sample.

Table 5

*Results of Dependent T-Test: MALE participants*

<table>
<thead>
<tr>
<th>Group</th>
<th>MD</th>
<th>N</th>
<th>SE</th>
<th>t-critical</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE PRE vs POST</td>
<td>17.5</td>
<td>14</td>
<td>2.18</td>
<td>1.77</td>
<td>1.78</td>
<td>0.049</td>
</tr>
</tbody>
</table>
**Hypothesis 2.** (Table 5) There was a significant difference between the Pre-test and Post-Test for male participants \[ t(14) = (1.78), p = .049 \]. The Post-Test one mile, run-walk-run time was statistically faster following the training in the Galloway Run-Walk-Run protocol than the Pre-test for the male participants.

Table 6

*Results of Dependent T-Test: FEMALE participants*

<table>
<thead>
<tr>
<th>Group</th>
<th>MD</th>
<th>N</th>
<th>SE</th>
<th>t-critical</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALE PRE vs POST</td>
<td>25.04</td>
<td>28</td>
<td>0.91</td>
<td>1.70</td>
<td>3.31</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

**Hypothesis 3.** (Table 6) There was a significant difference between the Pre-test and Post-Test for female participants \[ t(28) = (3.31), p < .001 \]. The Post-Test one mile, run-walk-run time was statistically faster following the training in the Galloway Run-Walk-Run protocol than the Pre-test for the female participants.

Table 7

*Results of Dependent T-Test: 7-DAY GROUP*

<table>
<thead>
<tr>
<th>Group</th>
<th>MD</th>
<th>N</th>
<th>SE</th>
<th>t-critical</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-DAY PRE vs POST</td>
<td>8.08</td>
<td>24</td>
<td>0.34</td>
<td>1.71</td>
<td>1.04</td>
<td>0.154</td>
</tr>
</tbody>
</table>

**Hypothesis 4.** (Table 7) There was no significant difference between the Pre-test and 7-day Post-Test group \[ t(24) = (1.04), p = .154 \]. The Post-Test one mile, run-walk-run time was not statistically faster following the training in the Galloway Run-Walk-Run protocol than the Pre-test for the participants who completed the Post-test seven days after the pre-test.
Table 8

Results of Dependent T-Test: 14-DAY GROUP

<table>
<thead>
<tr>
<th>Group</th>
<th>MD</th>
<th>N</th>
<th>SE</th>
<th>t-critical</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-DAY PRE vs POST</td>
<td>37.67</td>
<td>6</td>
<td>6.27</td>
<td>2.01</td>
<td>2.61</td>
<td>.024</td>
</tr>
</tbody>
</table>

**Hypothesis 5.** (Table 8) There was a significant difference between the Pre-test and 14-day Post-Test group \[t(6) = (2.61), p = .024\]. The Post-Test one mile, run-walk-run time was statistically faster following the training in the Galloway Run-Walk-Run protocol than the Pre-test for the participants who completed the Post-test 14 days after the pre-test.

Table 9

Results of Dependent T-Test: 21-DAY GROUP

<table>
<thead>
<tr>
<th>Group</th>
<th>MD</th>
<th>N</th>
<th>SE</th>
<th>t-critical</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-DAY PRE vs POST</td>
<td>43.82</td>
<td>12</td>
<td>3.65</td>
<td>1.79</td>
<td>4.98</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

**Hypothesis 6.** (Table 9) There was a significant difference between the Pre-test and 21-day Post-Test group \[t(12) = (4.98), p < .001\]. The Post-Test one mile, run-walk-run time was statistically faster following the training in the Galloway Run-Walk-Run protocol than the Pre-test for the participants who completed the Post-test 21 days after the pre-test.
Figure one shows average running times of (1) all participants, (2) male participants, (3) female participants, (4) all participants who tested days 7 days apart, (5) all participants who tested days 14 days apart, (6) all participants who tested days 21 days apart. All average time differences were determined to be significantly significant with the exception of test group (4); all participants who tested 7 days apart.
DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Discussion

Despite a high level of popularity and adherence, no previous studies have been performed regarding the Galloway Run Walk Run Training Method. This study was designed to observe and describe the change in a timed one-mile run-walk-run, following training in the GRWRTM protocol. The average scores from the pre to post test of all groups improved following training. All participants combined had an average improvement of 22.53 seconds. Subgroups (2) male participants, (3) female participants, (5) all participants with testing days 14 days apart, and (6) all participants with testing days 21 days apart were significantly better after training with improvements of (2) 17.5, (3) 25.04, (5) 37.67, (6) 43.83 seconds respectfully. While group (4) all participants with testing days 7 days apart also improved, the change 8.08 seconds was not statistically significant. These results indicate that the GRWRTM protocol may have potential as a novice style racing approach for performance optimization.

Subgroup (2) male participants (17.5 seconds change) demonstrated smaller levels of improvement as compared to subgroup (3) female participants (25.04 seconds change). While both subgroups showed significant improvement between the test and retest, female participants may experience a greater benefit from the GRWRTM’s protocols. It is unknown and not within the scope of this study to determine why female participants showed greater improvement than male participants. Subgroup (4) all participants with testing 7 days apart, demonstrated a non-significant improvement of 8.08 seconds from the pretest to the posttest while subgroup (5) all participants with testing days 14 days apart demonstrated a significant improvement of 37.67 seconds and subgroup (6) all participants with testing 21 days apart, demonstrated a significant
improvement of 43.83 seconds. This suggests that participants who had more time to practice the protocol performed better. As training adaptations generally take four to six weeks, it is most likely that improvement can be attributed to increased understanding and ability to implement the GRWRTM method. Total time training/practicing the protocol was not recorded, but is warranted for future studies. Increased participant practice appears to aid in maximizing the intended program design and the ability to receive optimal physiological adaptations.

This study was limited by the inclusion of only novice runners. Due to the nature of a community-based race preparation program, participants were inherently beginners. Change was determined by using a participant’s first and second attempt at the Magic Mile. Whenever test-retest occurs there is a strong chance that the participant will remember the first experience and make adjustments despite the intervention protocol. This is especially true with the very first time an individual runs a mile compared to their second attempt. Including experienced runners and other population groups in future studies will reduce test-retest errors.

This study used the Magic Mile to determine pre and post training performance. This test has not been accepted or used in previous research. Validity and reliability of the Magic Mile were inferred because they have been established for a variety of similar distance or time-based tests, such as the one-mile run or the 1.5 mile-mile run. Formal validity and reliability should be determined on the Magic Mile for future studies.

The scope of this study, only observes change between the first and second magic mile attempt. It does not measure variables which are associated why this change occurs. According to Galloway, the GRWRTM optimizes performance by extending time to fatigue, reducing overuse injuries, reducing core body temperature increases, increasing willingness to participant, and increasing general enjoyment during and after activity. While previous research may indicate
accuracy of these claims, future research is needed to establish whether any, all, or a combination of these variables leads to increased performance while utilizing the GRWRTM protocol.

Conclusions

Based on the results and within the scope of this study, the following conclusions were drawn:

1. There was significant change in the direction of improvement for a one mile, run-walk-run time trial that included all participants, following training in the GRWRTM protocol.
2. Both male and female participants showed significant improvement between the test and retest.
3. The more time participants had to practice the protocol before their retest date, the better they performed: 7 days apart- 8.08 seconds change, 14 days apart- 37.67 seconds change, 21 days apart- 43.83 seconds change.
4. Additional research is needed specifically in regards to instrumentation validity and reliability, data collection, and effectiveness as training protocol.

Recommendations

This study provides a preliminary look into the GRWRTM protocol as a one-mile run-walk-run time trial strategy, therefore additional research is needed:

1. Future studies should include additional data collection such as time spent training, injuries accrued, body composition, age, VO2max, training/racing history, core body temperate, perceived effort, and perceived enjoyment of activity.
2. The GRWRTM was specifically created to be an accessible marathon training protocol. Future studies should observe the GRWRTM’s effectiveness at the marathon distance and other more common distances such as the ½ marathon, 10k, and 5k.

3. Validity and reliability of the Magic Mile needs to be established.

4. Future studies should observe the effectiveness of the GRWRTM protocol on additional population groups such as experienced runners, protected populations, etc.

5. Future studies should examine the effects of the GRWRTM as a training protocol opposed to a racing method.

6. Literature review indicated that the GRWRTM may have potential to extend time to fatigue, reduce injury, reduce core body temperature increase, increase willingness to participate, and increase enjoyment of activity. Future studies should explore each of these components.

7. Future studies should contrast the MM with comparable submaximal aerobic cardiorespiratory tests.
REFERENCES


Appendix A

Galloway Run Walk Run Training Method Program Informed Consent Form

I know that walking, running and volunteering in club races and training programs are potentially hazardous activities. By entering this club and joining this training program, I am taking responsibility for medical clearance and for being physically fit and properly trained. I agree to abide by any decision of program officials relative to my ability to safely complete these activities. I assume all risks associated with walking, running, and volunteering in club races and training programs, including but not limited to my own fitness and health condition, falls, contact with other participants, the effects of weather including high heat and/or humidity, traffic and the conditions of the road and traffic on the course, all such risks being known and appreciated by me. Having read this waiver and knowing these facts and in consideration of you accepting my application, I for myself and anyone entitled to act on my behalf, waive and release the Road Runners Club of America, the Philippiades Runners club, Jeff Galloway, JFG Ltd., Galloway Productions, Directors, its leaders and officials, and all sponsors, their representatives and successors from all claims or liabilities of any kind arising out of my participation in this club and training program though that liability may arise out of negligence or carelessness on the persons named in this waiver and other organizations. I grant permission to all the foregoing to use any photographs, motion pictures, recordings or any other record of this program for any legitimate purpose. I understand that bicycles, skateboards, baby joggers, roller skates or blades, animals, and headsets are not allowed in this event and I will abide by this guideline.

Check, Master Card, VISA and American Express Accepted. Make checks payable to JFG.

Amount Paid $________ New To Program _________ Alumni _________

Credit card # ____________________________ ____________________________

Expiration Date _______/____ Name imprinted on card ______________________

Sorry, No Refunds!

Galloway Training Program Membership Does NOT Include Entry Into Any Race

For PD Use Only: Marathon _______ Half Marathon _______ Getting Started _______ 10K _______ Other _______

For Office Use Only: BK _______ Active _______

Galloway Productions, 4651 Roswell Road, I-802, Atlanta, GA 30342 / 404-255-1033 / 404-252-3971 (fax)
## Appendix B

### Example 7, 14, 21 Day Workload

<table>
<thead>
<tr>
<th></th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 0</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Magic Mile</td>
</tr>
<tr>
<td><strong>Week 1</strong></td>
<td>off</td>
<td>20-30 min. walk</td>
<td>20-30 min. run/walk</td>
<td>20-30 min. walk</td>
<td>20-30 min. run/walk</td>
<td>off</td>
<td>Magic Mile</td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td>off</td>
<td>25-45 min. walk</td>
<td>25-45 min. run/walk</td>
<td>25-45 min. walk</td>
<td>25-45 min. run/walk</td>
<td>off</td>
<td>40 min. run/walk</td>
</tr>
<tr>
<td><strong>Week 3</strong></td>
<td>off</td>
<td>30-60 min. walk</td>
<td>30-45 min. run/walk</td>
<td>30-60 min. walk</td>
<td>30-45 min. run/walk</td>
<td>off</td>
<td>Magic Mile</td>
</tr>
</tbody>
</table>
OFFICE OF SCHOLARSHIP AND SPONSORED PROJECTS

DATE:

TO: FROM:

STUDY TITLE:

IRB REFERENCE #: SUBMISSION TYPE:

ACTION: DECISION DATE:

REVIEW CATEGORY:

May 1, 2019

Ashley Turpin, MS
Fort Hays State University IRB

[1435431-1] Evaluating Effects of a Run-Walk-Run Training Program on One Mile Time Trial Performance

19-0140 New Project

DETERMINATION OF EXEMPT STATUS May 1, 2019

Exemption category # 4

Thank you for your submission of New Project materials for this research study. The departmental human subjects research committee and/or the Fort Hays State University IRB/IRB Administrator has determined that this project is EXEMPT FROM IRB REVIEW according to federal regulations.
Please note that any changes to this study may result in a change in exempt status. Any changes must be submitted to the IRB for review prior to implementation. In the event of a change, please follow the Instructions for Revisions at http://www.fhsu.edu/academic/gradschl/irb/.

The IRB administrator should be notified of adverse events or circumstances that meet the definition of unanticipated problems involving risks to subjects. See http://www.hhs.gov/ohrp/policy/AdvEvntGuid.htm.

We will put a copy of this correspondence on file in our office. Exempt studies are not subject to continuing review.

If you have any questions, please contact Leslie Paige at lpaige@fhsu.edu or 785-628-4349. Please include your study title and reference number in all correspondence with this office.
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Thesis: Effects of a Run-Walk-Run Training Program on One Mile Time Trial Performance

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