

RESILIENCE UNDER PRESSURE: EXAMINING THE EFFECT OF MENTAL TOUGHNESS TRAINING ON ARCHERS FACING EXTERNAL DISTRACTORS

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Abstract

This study investigates how mental toughness training affects young archers' performance when exposed to external distractions. Twelve under-13 male archers, capable of scoring between 290 and 310 out of 360 at 30 meters on an 80 cm six-ring target face, participated in the study. A pre-test and post-test scoring assessment was conducted under verbal and auditory distractions. The intervention lasted five weeks, exposing the archers to sudden noises, verbal mockery, and continuous music during training sessions. Results showed a significant improvement in performance, with the mean score increasing from 281.33 to 300.25 ($p < 0.05$). These findings suggest that structured mental toughness training can enhance resilience, allowing athletes to maintain focus and performance under pressure and distractions.

Keywords: mental toughness training, tiny tots, archery, compound bow, performance improvement, training, form and consistency, scoring, noise, external distractors

Introduction:

In archery, precision and consistency are paramount, requiring athletes to maintain focus amidst various external distractions. Developing mental toughness is essential for archers to perform optimally under such conditions. Mental toughness refers to an individual's ability to cope with stressors, pressures, and challenges, enabling consistent performance regardless of circumstances. It encompasses attributes such as resilience, confidence, and concentration, which are crucial for athletes facing competitive pressures.

Previous research has highlighted the significance of mental training in enhancing athletic performance. For instance, a study by Monzoni et al. (2018) demonstrated that combining functional training with mental training, including concentration exercises and personal technique analysis, effectively improved archers' performance during competitions. Similarly, imagery training and self-talk have been shown to reduce state anxiety and enhance self-confidence, leading to improved archery performance (Isar et al., 2022). Furthermore, mindfulness-based interventions have been associated with better shooting performance and cognitive functions in archers, suggesting that mental training can positively influence both psychological and physical aspects of performance (Wu et al., 2021). Despite these findings, there is limited empirical research specifically examining the effectiveness of structured mental toughness training programs on young archers facing external distractors. This study aims to fill this gap by investigating the impact of a five-week mental toughness training regimen on the performance of

under-13 male archers subjected to verbal and auditory distractions during practice sessions.

Need for the Study : While archers often practice in controlled environments, real-world competitions involve unavoidable external disturbances. Training under distraction-free conditions may not fully prepare athletes for high-pressure scenarios. Developing mental toughness through systematic exposure to distractions could help archers maintain their performance despite external stressors.

Purpose of the Study

This study aims to:

1. Examine the effect of external distractions on archery performance.
2. Implement a structured mental toughness training program involving controlled exposure to distractions.
3. Determine if this training enhances an archer's ability to maintain accuracy and consistency under competitive conditions.

Objectives:

1. To evaluate the effect of mental toughness training on the scoring performance of young archers under 13 years old in the compound bow category.
2. To determine the significance of performance improvements, as measured by pre- and post-test scores at a distance of 30 meters.

Literature Review

Mental Toughness in Archery

Mental toughness is a critical component in archery, enabling athletes to perform consistently under pressure. Techniques such as visualization,

goal setting, and positive self-talk have been identified as effective methods to enhance mental resilience. For example, a study by Cowden et al. (2020) emphasized the role of mental toughness in sport performance, highlighting its importance in coping with competitive pressures. Additionally, research by Jemmy et al. (2018) found that mental toughness and positivity are significant predictors of performance strategies used by competing athletes.

Impact of External Distractions

External distractions, including environmental noise and audience presence, can significantly impact an archer's concentration and performance. Vrbik et al. (2015) noted that archery is predominantly mentally oriented, and managing attention and relaxation levels is crucial for optimal performance. Moreover, research indicates that mental training interventions can help athletes maintain focus amidst distractions, thereby enhancing performance.

Psychological Strategies for Performance Enhancement

The utilization of psychological skills and strategies, such as imagery training, self-talk, and mindfulness-based interventions, has been associated with enhanced athletic performance under pressure. Isar et al. (2022) demonstrated that imagery training and self-talk effectively reduce state anxiety and improve archery performance. Similarly, Wu et al. (2021) found that mindfulness-based interventions positively influence shooting performance and cognitive functions in archers. These findings underscore the potential of psychological strategies in mitigating the adverse effects of external distractions on performance.

Methodology

This study employed a pre-test/post-test experimental design involving twelve under-13 male archers trained to shoot at a 30-meter distance. Participants underwent five weeks of structured mental toughness training, incorporating verbal distractions such as shouting and music to simulate competition-like pressure. The pre-test measured performance scores under distraction conditions, followed by the training intervention. Post-test scores were then recorded and analyzed using statistical tests, including the Shapiro-Wilk test for normality and paired t-tests for significance. A significance level of $p < 0.05$ was used to determine the effectiveness of the intervention.

Data Collection:

The participants in this study consisted of 12 boys

under the age of 13, all of whom were compound bow archers capable of shooting at the 80cm six ring target face at the distance of 30 meters. The training program was conducted 5 weeks, with sessions held on Monday, Wednesday and Friday.

Procedure:

Pre-Test : Before the training intervention, a baseline performance test was conducted to assess how external distractions affected the archers. Each participant shot 6 arrows (6 ends of 6 arrows each) at 30 meters on an 80 cm six-ring target face under deliberate distraction conditions. Two types of distractions were introduced during the test:

Verbal distractions: Loud shouting, negative cue words, and mocking.

Auditory distractions: Background music played at varying volumes.

The scores were recorded as the pre-test mean score for each participant.

Mental Toughness Training (5 Weeks)

After the pre-test, a structured mental toughness training program was implemented, designed to systematically expose archers to distractions during practice sessions. The training was conducted three times a week (Monday, Wednesday, Friday) with a different type of distraction used on each day.

Monday: Sudden Noise & Verbal Distractions

- Archers trained while being exposed to sudden loud noises (whistles, claps, and unexpected sounds).
- Coaches and assistants verbally distracted the archers by shouting, giving negative cues, and mocking them.
- The goal was to train archers to maintain composure and focus despite unexpected auditory disturbances.

Wednesday: Continuous Background Music

- Various songs were played throughout the training session, including fast-paced, distracting, or unfamiliar music.
- The intent was to create a constantly noisy environment, requiring archers to filter out distractions and concentrate on their shots.
- Coaches observed and guided athletes in using mental focus techniques, such as positive cue words, visualization and self-talk.

Friday: Combination of Both Distractions

- Both verbal distractions and background music were used simultaneously.
- This was the most intense training day, designed to mimic high-pressure competition environments.
- Archers were encouraged to apply techniques learned on Monday and Wednesday to maintain

consistency in their shots.

The training was conducted over five weeks, with each session lasting approximately 90 minutes. Archers completed multiple shooting sets while gradually adapting to distraction-filled conditions.

Post-Test : At the end of the five-week training program, a post-test was conducted under the same distraction conditions as the pre-test to measure improvements. Archers performed the same 36-arrow scoring test at 30 meters with verbal and

auditory distractions. The post-test scores were recorded and compared with pre-test scores.

Data Analysis:

The data collected from the pre- and post-tests were analyzed using a paired t-test. This statistical method was chosen to compare the mean scores of the two tests, allowing for an evaluation of whether the observed changes in performance were statistically significant

Statistical Treatment:

Pre-Test Mean Score: **281.33**

Post-Test Mean Score: **300.25**

p-value: **< 0.05**

T-Test

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre_Test	281.33	12	7.855	2.267
	Post_Test	300.25	12	7.545	2.178

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre_Test - Post Test	-18.917	8.062	2.327	-24.039	-13.794	-8.128	11	.000

The paired t-test results indicated a statistically significant improvement in the participants' performance following the blank bale training program. The p-value being smaller than 0.05 demonstrates that the increase in scores was not due to chance, confirming the effectiveness of the training.

Findings:

The study revealed a significant improvement in archers' performance following the mental toughness training. The mean pre-test score was 281.33, while the mean post-test score increased to 300.25, indicating notable progress. Statistical analysis confirmed the p-value was below 0.05, demonstrating that the observed improvement was significant.

Managerial Implications

- **Coaching Strategies:** Coaches should integrate structured mental training into daily routines to develop archers' resilience under pressure.
- **Talent Development Programs:** National and state archery federations can design athlete development programs incorporating psychological conditioning alongside physical training.

- **Equipment Manufacturers:** Companies designing archery simulation tools could incorporate mental training features into their software to help athletes practice under stress.
- **Educational Institutions:** Schools and sports academies should implement sports psychology modules to train young athletes in mental resilience from an early stage.

Recommendations:

1. **Integrate Distraction Training:** Coaches should gradually introduce external distractions in practice sessions to help archers develop focus and composure.
2. **Use Varied Distraction Techniques:** Training should include different types of distractions, such as sudden noises, verbal pressure, and background noise, to simulate diverse competitive environments.
3. **Develop Mental Coping Strategies:** Athletes should practice techniques like controlled breathing, self-talk, and attention focus to maintain concentration during high-pressure situations.
4. **Extend the Training Duration:** Future programs could explore the impact of longer training periods to determine if sustained exposure further enhances resilience.

Limitations

- The small sample size of twelve participants limits the generalizability of the findings.
- The study focused only on male archers under 13, excluding potential gender and age-based variations.
- External distractions were limited to verbal stimuli; other real-world stressors, such as environmental conditions were not incorporated.
- The short duration (five weeks) may not fully capture long-term improvements in mental toughness.

Future Research Scope

1. **Larger and More Diverse Samples:** Future studies should include a larger pool of participants across different age groups and genders to enhance generalizability.
2. **Extended Training Durations:** Longitudinal studies examining the long-term impact of mental toughness training on performance consistency.
3. **Incorporation of Multiple Distraction Types:** Investigating the effects of visual, environmental, and competitive stressors on performance.
4. **Neurocognitive Analysis:** Using EEG or fMRI to study brain activity changes in archers undergoing mental toughness training.

Conclusion:

This study demonstrates that structured mental toughness training significantly improves young archers' ability to maintain performance under distracting conditions. By systematically exposing athletes to external disturbances, the training helped them develop the resilience needed to perform consistently in high-pressure environments. The significant improvement in post-test scores suggests that integrating distraction-based training into regular practice can enhance focus, composure,

and overall shooting accuracy.

These findings provide valuable insights for coaches, athletes, and sports psychologists, emphasizing the importance of mental resilience training in precision sports. Future studies could further explore the long-term benefits of such training and its application across different skill levels and sporting disciplines.

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