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The Effects of Transformational Leadership Coaching on Player Mental Toughness

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Abstract

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MSc, Walden University, 2019

MSc, California University of Pennsylvania, 2009

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Health Psychology

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Abstract

Mental health in adolescents is a growing concern, with between 10 and 20% experiencing problems globally. In this study, transformational leadership coaching was assessed to determine if it effectively reduced the prevalence of mental health issues in adolescents by assessing their mental toughness. No previous studies have examined the relationship between these variables in this population. Transformational leadership theory is the theoretical framework for this study which empowers individuals, developing confidence and producing leadership qualities. Mental toughness is a six-factor construct consisting of life and emotional control, commitment, challenge, interpersonal confidence, and confidence in one's abilities and assessed using the Mental Toughness Questionnaire 48 test (MTQ48). A quasi-experimental design was used to analyze secondary data on 96 adolescent cricket players from a London school, 43 coached in a traditional manner, and 56 in a transformational leadership way. Participants completed an MTQ48 pre- and post-6-week coaching intervention. A mixed-methods ANOVA was conducted for all mental toughness factors and a multiple linear regression analysis was used to assess if group assignment, baseline total score, competitive playing level and age serve as predictors of the final total score. Results displayed significance in improved mental toughness and emotional control in the experimental group. All other factors, except challenge, showed signs of improvement. This study shows that using transformational leadership coaching can lead to positive social change by improving overall mental toughness and emotional control in adolescents, developing their ability to respond positively to challenges and improving their overall mental well-being.

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Dedication

I dedicate this dissertation to those who work in sport and education, who have a common goal of helping and aiding students in our care, physically and psychologically. We strive to improve performance, but, more importantly, we give participants a positive role model to emulate for future generations and formulate positive memories of their sporting development and improve their mental well-being through physical activity.

Acknowledgments

Firstly, I would like to acknowledge my beautiful, supportive, and inspirational wife, Michelle, who always encouraged me to pursue this goal, even when times were challenging. My daughter Sienna has tolerated the time I have spent writing instead of playing. We will have much more time for fun now that this is complete. I wish to thank and fully acknowledge my father, Professor Finch, who has been inspirational in undertaking this Ph.D. and a great help throughout. His dedication to his work, drive, intellect, and leading achievements in the medical field have inspired me to undertake my dissertation and study an area of interest to the highest level. Also, I would like to acknowledge my mother who was instrumental in giving me support and opportunities when I was younger, which have led to my position now. I cannot thank her enough for her loving, strong, and selfless support throughout my life. I wish to acknowledge Danny Grewcock (MBE) for his inspirational leadership as a work colleague and friend. His thought processes and manner have directed my thinking to focus on this area of study. What he does naturally, so many cannot even train to deliver. I want to thank my Chair Dr. King for her constant guidance and strong support during each step of the journey and Dr. Gil for her direct guidance throughout. Without both, I would not have got to this point. Also, Alastair Land, for his support of my study, whist working. Finally, I thank Tony Rolt, who was a significant part of my school life as my senior rugby coach and Director of Sport. His passion and correct moral compass have stayed with me since I was a young boy and have inspired me to be the man I am today, working in sport and hopefully influencing others in the same positive and passionate way.

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Chapter 1: Introduction to the Study

In this study, my goal was to find a method of using sports coaching to improve mental toughness, thus reducing the prevalence of mental health issues within the United Kingdom and potentially globally I used transformational leadership coaching, a form of coaching that is now regularly used within all levels of sport as stated by Turnnidge & Côté (2017), from elite performance to grassroots, as the conceptual framework for this study. I investigated the detailed conceptual developments of sports coaching and how sport has become such an important, valued, and significant component of students' lives and development at school as outlined by Sabiston et al., (2016). I also reviewed the current prevalence of mental health issues among adolescents regarding their use of modern technology and cyberbullying, two things that Skilbred-Fjeld et al., (2020) state create higher levels of depression and anxiety within this population group. In this study, I explored the foundations of sport in a school setting as discussed by Moxon et al., (2019), and the known key benefits of providing sport within the younger, adolescent years of an individual's life. I focused on mental toughness and improved psychological well-being through participation in sport by using the method of transformational leadership coaching to improve these essential positive psychological aspects. Sports coaching has evolved from a position of power and dictatorship to a place where personal care, empathy, and understanding of the players in the group are critical in ensuring forward progression within any sport, combining this with exceptional sporting knowledge and enthusiasm (Weinberg et al., 2016).

This positive leadership and management theory is prevalent within organizational structures and the sporting arena with significant effect. Current views in the literature displayed clear developments in coaching styles, with the focus being the empowerment of the player and their followership of the coach. This form of coaching is transformational leadership coaching, where the taught participants become leaders themselves (Turnnidge & Côté, 2017).

Transformational leadership coaching focuses on developing the four "I"s: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration (Turnnidge & Côté, 2017). This coaching style improves sporting performance and participant well-being because the coach carefully manages the environment and challenges that players experience.

Mental toughness in sport is an area that academics have researched extensively. Each factor of the construct can be focused on and developed individually to improve overall mental toughness (Weinberg et al., 2016). For more than 30 years, mental toughness has been one of the essential characteristics in ensuring success within athletic performance (Cowden, 2016). Mental toughness is a construct that is reliably and effectively assessed using the Mental Toughness Questionnaire 48 (MTQ48) (Vaughan et al., 2018).

Providing a coaching structure that improves mental toughness can provide a system that improves sports performance and improves the players' psychological well-being. These improvements then reduce the prevalence of mental health issues in adolescents and the participants' later lives. My goal for this study was to discover if

transformational leadership coaching is an effective platform for improving mental toughness in school sports participants.

In this chapter, I review the literature on transformational leadership coaching and mental toughness. In addition, the chapter includes a discussion of the theoretical framework, sources of data, possible methods of analysis, key assumptions, and delimitations of the study.

Background of the Study

The research literature on transformational leadership coaching and mental toughness in sport analyze the detailed conceptual developments of sports coaching. It also focuses on why sport has become such a valued component of students' development while at school. The research literature discusses the foundations of sport in a school setting and the known key benefits of providing sport within the adolescent years of an individual's life. The critical element to this adolescent development is to ensure their ability to approach their life with a level of control, confidence, and commitment. It also gives them the tools to see challenges in life as opportunities to expand and develop themselves (Clough & Strycharczyk, 2015). These are the foundations of the mental toughness construct which creates improved psychological well-being through participation in a sport (Clough & Strycharczyk, 2015).

Studies by Clough and Strycharczyk (2015) and Doerr et al. (2018) displayed significant results showing that youth who have higher mental toughness experience lower anxiety levels. They can also cope with higher levels of stress and react more positively during stressful situations, which improves their mental well-being.

Furthermore, youth displayed higher resilience to challenging tasks within a sporting context, with significant results in both studies showing a correlation between higher levels of mental toughness and improved well-being among youth athletes (Clough & Strycharczyk, 2015; Doerr et al., 2018).

Numerous studies conducted by Clough et al. (2015) on the mental toughness construct have shown that researchers can measure each factor. From this, researchers can set specific exercises to improve each factor individually, increasing mental toughness levels. The studies conducted by Clough et al. (2015) focused on mental toughness in adolescents, stress resilience in adolescents, the direct and moderating role of mental toughness in sport, adolescents' exercise and physical activity, and its relationship with mental toughness and mental toughness and athletes use of psychological strategies. The six factors of the construct are life control, emotional control, confidence in one's abilities, interpersonal confidence, commitment, and challenge. Thoughtful and individualized approaches to the athletes need to be taken by coaches for practical improvements to occur (Weinberg et al., 2016).

In my review of the literature, I focused on the research gap identified by Turnnidge and Côté (2018). These authors suggested that future research on youth sports coaching, which intends to use transformational leadership methods, investigate whether there are positive outcomes of increased player participation in later life and improved participant mental well-being.

In this study, I investigated whether transformational leadership coaching effectively improved mental toughness in school sports participants. If significant, this

could be evidence to national governing bodies and schools to increase transformational leadership coaching practice. The benefits are that adolescents coached in this way during their younger academic years in sport will gain essential psychological tools for later life. The improved mental toughness will relate to the participant's improved psychological well-being, which would be a very positive outcome of the study. If it can be shown that providing a specific coaching structure improves mental toughness, a structure can be provided that improves sports performance and players' psychological well-being, thus enabling the assumption that this may reduce the prevalence of mental health issues in the adolescent population and their later lives.

Problem Statement

Mental health in adolescents is a growing concern: between 10 to 20% of children within this age category are experiencing mental health problems globally (Nebhinani & Jain, 2019). The World Health Organization (WHO) defined mental health as "a state of well-being in which the individual realizes his or her abilities, can cope with the normal stresses of life, can work productively and fruitfully, and can contribute to his or her community" (WHO, 2004). School sport may be an effective method of reducing mental health issues in early adulthood, according to the results of a retrospective study conducted on 680 men between the ages of 20 and 35 who discussed playing sports since the age of 12 (Appelqvist-Schmidlechner et al., 2017). Mainly, sport-specific practice improves mental toughness (Raudsepp & Vink, 2018). Mental toughness is a construct that encompasses life and emotional control, commitment through goal and achievement orientation, challenge through risk and learning orientation, and confidence in one’s

abilities. Researchers discuss that the individual's emotional well-being improves due to developing mental toughness (Clough & Strycharczyk, 2015).

Transformational leadership coaching has been applied in sports training for over a decade (Arthur et al., 2017). It is a method of coaching in sport that is being utilized more recently at the elite level with professional athletes within many sports and in coach development programs for youth sport (Turnnidge & Côté, 2017). It first appeared within a sporting domain in 1998 by Murray and May (Charbonneau et al., 2001). Transformational leadership coaching places a strong emphasis on the coach's ability to create a supportive environment where participants develop autonomy over their progression. It reduces the pressure placed upon the participants, increases confidence, and develops the ability to problem solve and perform independently, which is a vital component within sports (Clough & Strycharczyk, 2015). Transformational leadership coaching improves well-being in elite professional athletes (Horn, 2008; Kao & Tsai, 2016; Stenling & Tafvelin, 2014). However, researchers do not know to what extent transformational leadership coaching effectively improves mental toughness in school sports participants.

Purpose of the Study

The purpose of this quantitative study was to assess the effectiveness of transformational leadership coaching as a strategy for improving mental toughness in school sports participants. Coaching style was the independent variable, and there were two levels of this variable: transformational leadership and traditional methods. The experimental group coaches used transformational leadership coaching. The control

group coaches used traditional methods of coaching. Transformational leadership coaching is a successful coaching strategy for attaining higher performance from elite professional sports participants (Kao & Tsai, 2016). The dependent variable of mental toughness is a successful means of improving the performance and emotional well-being of high school sportsmen and women (Moxon et al., 2019). I assessed the age and competitive playing level within the linear multiple regression statistical analysis. These factors may be reasons for participants to have developed their mental toughness before the coaching intervention. The definition of competitive playing level is the standard of the team the participants played for. I measured this using annual age brackets and playing level of the team, A being the highest, and then subsequent teams below this having lower playing ability level (e.g., U14A team or U14D team). This method of ability identification is a critical selection tool within U.K. junior and adolescent sport, as it means participants always play at an appropriate level of competition for their playing standard, ensuring a safe and enjoyable experience (Cobley et al., 2009). Although numerous studies have been conducted on the use of transformational leadership to improve well-being in elite sports men and women, there is no research found showing that transformational leadership coaching is an effective platform for improving mental toughness in school sports participants.

Research Questions and Hypotheses

The purpose of this quantitative study was to assess the effectiveness of transformational leadership coaching as a strategy for improving mental toughness in school sports participants. I assessed mental toughness by using the MTQ48 as per

previous research conducted by Vaughan et al., (2018). I analyzed the total score (mental toughness) and scores of the six subscales of the MTQ48 (life control, emotional control, confidence in one's abilities, interpersonal confidence, commitment, and challenge). I used a multiple linear regression analysis to assess the effect of age and competitive playing level on changes in mental toughness scores from baseline assessment. My assumption was that older and/or those playing a higher competitive level of sport would have had greater exposure to playing situations and coaching, thus possibly helping to develop their mental toughness.

Research Question 1 (RQ1): Is change in mental toughness score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$1): There is no significant difference in mental toughness score over time as a function of group assignment.

Alternative Hypothesis ($H_1$1): There is a significant difference in mental toughness score over time as a function of group assignment.

Research Question 2 (RQ2): Is change in commitment score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$2): There is no significant difference in commitment change score over time as a function of group assignment.

Alternative Hypothesis ($H_1$2): There is a significant difference in commitment change score over time as a function of group assignment.

Research Question 3 (RQ3): Is change in control (life) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$3): There is no significant difference in control (life) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$3): There is a significant difference in control (life) score over time as a function of group assignment.

Research Question 4 (RQ4): Is change in control (emotion) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$4): There is no significant difference in control (emotion) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$4): There is a significant difference in control (emotion) score over time as a function of group assignment.

Research Question 5 (RQ5): Is change in challenge score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$5): There is no significant difference in challenge score over time as a function of group assignment.

Alternative Hypothesis ($H_1$5): There is a significant difference in challenge scores over time as a function of group assignment.

Research Question 6 (RQ6): Is change in confidence (abilities) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$6): There is no significant difference in confidence (abilities) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$6): There is a significant difference in confidence (abilities) score over time as a function of group assignment.

Research Question 7 (RQ7): Is change in confidence (interpersonal) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$7): There is no significant difference in confidence (interpersonal) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$7): There is a significant difference in confidence (interpersonal) score over time as a function of group assignment.

Research Question 8 (RQ8): Do group assignment, baseline total score, competitive playing level, and age serve as predictors of the final total score.

Null Hypothesis ($H_0$8): None of the variables, group assignment, baseline score, competitive playing level, and age, serve as predictors of the final total score.

Alternative Hypothesis ($H_1$8): At least one of the variables, group assignment, baseline score, competitive playing level, and age, serve as a predictor of the final total score.

Theoretical Framework

The framework for this research study was transformational leadership theory as outlined by Bass (1996) and was used more recently by Turnnidge and Côté (2018) in their research on transformational leadership coaching. The theory focuses on empowering the followers of a leader by inspiring and challenging them, thus developing their motivation, and enabling them to achieve their full potential (Turnnidge & Côté, 2018). It has been used extensively in the quest for better leadership in organizational settings, which improves employees' well-being. Further research conducted used this framework in military, education, and health care settings, but little is found within the sporting domain (Turnnidge & Côté, 2018). Turnnidge and Côté (2018) stated that the transformational leadership coaching framework is potentially an essential tool in developing leadership and followership within sports coaching research. Chapter 2 includes a detailed discussion of this topic.

Nature of the Study

This study was a quasi-experimental quantitative analysis consisting of 10 amateur sports coaches within a senior school sporting environment and the 12 players they all coach within their squads, amounting to 120 player participants. The 10 coaches recruited for assessment over a 6-week competitive period were organized into two groups of five. One group consisted of coaches who participated in a transformational leadership workshop, a continued professional development workshop that my place of work organized for the heads of sports. I identified that this study was an opportunity to investigate the effectiveness of transformational leadership coaching on improving

mental toughness. Therefore, the coaches who attended the school workshop were the coaches that I selected for the experimental group. I also selected a control group of five other coaches who did not receive the coaching workshop but coach sports to teams within the school sports program.

The transformational leadership workshop sessions were theory-based; I explained the theory explained and discussed personalized practical scenarios for each sports coach within their areas of expertise. I demonstrated ways to apply the theory to the practical coaching environment by giving the coaches clear examples of how they can apply this coaching method to their sporting environments. I completed the coaching follow-up following the theoretical framework of transformational leadership theory used by Turnnidge & Côté, (2017), using specific examples of affecting performance focusing on the four "I"s of idealized influence, inspirational motivation, intellectual stimulation, and individual consideration. The school sports administrator emailed the five coaches in the experimental group an instruction sheet, outlining key reminders of how they should conduct themselves to be effective transformational leadership coaches (Appendix F).

The 120 students (14–18 years of age) of each of the coaches who participated in this study answered questionnaires to assess the level of mental toughness using the MTQ48. Clough et al. (2002) constructed this questionnaire, which possesses established psychometric properties. The test offers excellent reliability and internal consistency (Zalewska et al., 2019). The MTQ48 measures the four subscales of commitment, control, challenge, and confidence and was developed using a confirmatory factor analysis (Zalewska et al., 2019). The test uses 48 items within the questionnaire, assessed

on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). There are 22 reverse coded items, and the results are polarized. The assessment has been used reliably among global athlete and non-athlete mental toughness assessments (Vaughan et al., 2018). Its more reliable results have been among sports players between 14–17 years (Zalewska et al., 2019).

MTQ48 assessments occurred before any coaching sessions commenced to assess participants' mental toughness scores before the season's training. Participants' mental toughness scores were assessed again at the end of 6 weeks. I recorded the two separate scores and the difference between the assessment scores for statistical analysis. Statistical analysis was a two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8, which focused on the effect that baseline score, coaching, age and competitive playing level had on changes seen in player mental toughness.

Definitions

Competitive Playing Level: The standard of the team that sports participants play and train with during their junior and adolescent involvements in sports. It is measured using the annual age group bracket of the participant and the standard of team they play for if there are more overall participants than to make a single team, e.g., U14B team. Selection for sports teams is performed at the start of each season to ensure that participants are selected to play in a team that is both physically and technically at the

appropriate standard for their ability and physical condition. This provides a safer and enjoyable playing environment for them to compete in (Cobley et al., 2009).

Mental Toughness: A personality trait that portrays the person's ability to cope with pressure, stress, and challenges, regardless of the circumstances they find themselves in (Clough & Strycharczyk, 2015).

Traditional Coaching: Prescriptive coach-led method that focuses on developing the perfect technique via large amounts of instructional information, repeated drills, and corrective feedback. This coaching style lacks problem-solving and decision-making development, with coaches coaching as they were, limiting the development of the players to the playing level of the coach (Stone et al., 2020).

Transformational Leadership Coaching: A form of coaching where leaders effectively use inter-personal skills to develop their athletes into leaders using means of empowering and inspiring them, giving them the confidence to seek out challenges and ensuring that they are working towards the common goal of the team (Bass & Riggio, 2006; Turnnidge & Côté, 2018).

Assumptions

Certain assumptions were necessary to produce reliable quality results. If possible, adolescent participants who answered the MTQ48 were from the younger age groups within the educational setting. I assumed that those in the older age group elite teams would have had greater exposure to higher-level competition. Therefore, their mental toughness levels would have been higher as a result. This is because athletes in

high-level sports are shown to possess already more significant levels of mental toughness (Liew et al., 2019).

I also assumed that the younger age groups would likely have had less exposure to any form of transformational leadership coaching because they have come from preparatory schools. Traditional coaching is still the primary method of sports coaching in these younger educational establishments. When completing the MTQ48 test, pre- and post-coaching period, I assumed that the participants answered honestly and correctly to enable valued results to be used for statistical analysis.

Scope and Delimitations of the Study

This research study relied heavily on the students' relationship with the coach, regardless of the coaching method. If the connection was not positive and robust, then the coaching impact may have affected the study's overall results. In addition to this, the boys' mood during the sessions may have impacted the level of progress and activity completed within each training session. To address this, the coaches who were selected for the transformational leadership coaching group were known to actively adopt this method of coaching over others and attended the transformational leadership coaching workshop with Dr. Turnnidge. In contrast, coaches of the control group were actively chosen because they neither knew nor used any transformational leadership coaching methods.

The sport selected was cricket because this was the sport that was coached during the assessment period. The sport is not selected. Instead, the coaches were chosen since they were the ones who used transformational leadership coaching methods. The sport

could vary, but the coaching methods should have remained the same. Using this design, further research can be conducted on other individual sports.

Limitations of the Study

The higher the level of performance of the team and coach, the smaller the level of improved mental toughness was expected. In higher-level sports performers, mental toughness will already be high due to the greater experience of working in challenging situations. Mental toughness may increase throughout a season regardless of the transformational leadership coaching environment provided by the coach due to players developing confidence in their abilities and improving their problem-solving skills while being challenged through training and competition. It was hypothesized that higher increases in mental toughness would be seen using transformational leadership coaching.

Significance

The importance of this study is to find if there is a positive relationship between a transformational leadership coaching style and the development of greater mental toughness in school sports participants. This research finding fulfills the gap in the research identified by Turnnidge and Côté (2018). They state that future work using transformational leadership coaching could show positive outcomes in youth sports development. Turnnidge & Côté (2018) hope their research will spark further interest in facilitating a positive environment provided by coaches to improve youth sport. No known research focuses on developing mental toughness in adolescent sports participants using transformational leadership coaching methods. Suppose through this study, it is found statistically significant and therefore an effective method of coaching. In that case,

this may be the evidence that coaches in clubs and school sport and national governing bodies need to ensure that a transformational leadership coaching style should be adopted by all their coaches. Further benefits may be improving the personal confidence and resilience of the players while on the field, as well as increasing team cohesion, and it may also lead to improved mental well-being, as discussed by Clough et al., (2002), thus hopefully reducing the growing prevalence of mental health issues in the adolescent population within the UK and globally.

Social Change

Transformational leadership coaches can inspire those they lead. This can be a culture in which players replicate transformational leadership coaching to their peers and families as the players age from adolescence into adulthood. The positive influence of this coaching style can develop autonomy in the players, enabling them to make decisions confidently and overcome obstacles, generating a culture of respect and care for those around us with the hope that it improves the participants' mental well-being for life. Thus, the transformational leadership coaching style is a model for positive social change in sports, which will benefit the players in their life progression, not just in the competitive sporting arena.

Summary

In chapter 1, transformational leadership coaching and its possible development of mental toughness, including benefits of this form of coaching over traditional methods, were reviewed. The background to the study, purpose, and problem statement was discussed. A brief synopsis of the theoretical framework and the feasible methodology

were also outlined, clearly identifying the research gap of transformational leadership coaching as a method of coaching that develops mental toughness, thus improving mental well-being. There is no research to date which measures the effect of transformational leadership coaching on the development of mental toughness in adolescent sports participants. The limitations and significance of the study were also discussed. In Chapter 2, the supporting literature surrounding transformational leadership and mental toughness related to the research project and the development of the research design are discussed. Mental health prevalence in adolescents, leadership principles, and sports coaching styles are reviewed, and school sport plays a role in a child's physical and psychological development.

Chapter 2: Literature Review

Mental health in adolescents is a growing concern, with between 10 and 20% of children within this age category experiencing mental health problems globally (Nebhinani & Jain, 2019). The purpose of this quantitative study was to assess the effectiveness of transformational leadership coaching as a strategy for improving mental toughness in school sports participants, as there is no research to date to support this. This form of coaching may effectively reduce the prevalence of mental health issues in the adolescent population. School sport reduces mental health issues in early adulthood, according to the results of a retrospective study by Appelqvist-Schmidlechner et al., (2017), conducted on 680 men between the ages of 20 and 35 who discussed playing sports since the age of 12. Mental toughness is a construct that encompasses life and emotional control, commitment through goal and achievement orientation, challenge through risk and learning orientation, and confidence in one's abilities, the individual's emotional well-being is improved as a consequence of developing mental toughness (Clough & Strycharczyk, 2015). Mental toughness is a successful means of improving the performance and emotional well-being of high school sportsmen and women (Moxon et al., 2019).

Transformational leadership coaching has been applied in sports training for over a decade (Arthur et al., 2017). It is a method of coaching in sport that is being utilized more recently at the elite level with professional athletes within a multitude of sports and in youth sports coach development programs (Turnnidge & Côté, 2017). It reduces the pressure placed upon the participants, increases confidence, and develops the ability to

problem solve and perform independently, which is a vital component within sports (Clough & Strycharczyk, 2015). Transformational leadership coaching improves well-being in elite professional athletes (Horn, 2008; Kao & Tsai, 2016; Stenling & Tafvelin, 2014) and is a successful coaching strategy for coaches to attain higher performance from elite professional sports participants (Kao & Tsai, 2016).

The following literature review includes a discussion of the detailed conceptual developments of sports coaching and how sport has become such an important, valued, and significant component of students' lives and development at school. I reviewed the current prevalence of mental health issues among adolescents, the foundations of sport in a school setting, and the known key benefits of providing sport within the adolescent years of an individual's life. I focused on mental toughness and improved psychological well-being through participation in sport, which is the basis of this study. The evolution of sports coaching has taken the role from a position of power and dictatorship within traditional coaching methods to one where personal care, empathy, and understanding of the players in the group is critical in ensuring forward progression within any sport, coupled with exceptional sporting knowledge and enthusiasm. Positive developments from leadership and management theories within an organizational structure are now used within the sporting arena with significant effect. Mental toughness is one area studied in sport where each factor of the Mental Toughness construct can be focused and developed individually to improve overall mental toughness. The literature review focused on how mental toughness is now a construct that can be reliably and effectively assessed using the MTQ48 assessment. The final discussion aspects of the literature

review focus on improved mental toughness leading to the greater psychological well-being of the participant. If a coaching structure that improves mental toughness can be provided, a structure that improves sports performance and improves the players' psychological well-being will also be provided. This reduces the prevalence of mental health issues in the adolescent population and the participants' later lives. Studies that have assessed transformational leadership coaching and the mental toughness constructs will be discussed, but none have focused on the two within a school sports setting.

Literature Search Strategy

I researched articles relating to transformational leadership coaching and mental toughness in sport, for use within the writing of this doctoral dissertation. These were searched for using EBSCO, provided through the Walden Library, with Psych INFO and Psych Articles as the leading specific search databases. I used a Keyword search within a Boolean search looking for: *mental toughness and sport, mental toughness and well-being, mental toughness and emotional intelligence, transformational leadership coaching and emotional intelligence, transformational leadership coaching and sport, mental toughness questionnaire,* and *transformational leadership coaching development*.

Theoretical Foundation

The theoretical foundation for this research study is the transformational leadership theory based on the initial work conducted by Bass, (1996). This theory focuses on empowering followers of a leader by inspiring and challenging them, thus developing their motivation, and enabling them to achieve their full potential (Turnnidge & Côté, 2018). It has been used extensively in the research quest for better leadership in

organizational settings, which can result in the well-being of employees. Further research conducted using this framework is in the military, education, and health care settings but little within the sporting domain (Turnnidge & Côté, 2018). Turnnidge and Côté (2018) stated that the transformational leadership coaching framework is potentially an essential tool in developing leadership and followership within sports coaching research. I review leadership theories further, which are discussed to offer an overview of the evolution of perceived effective leadership practice.

Literature Review of Current Mental Health Issues in Adolescents

Mental health in adolescents is a growing concern, with estimates being between 10% to 20% of children within this age category experiencing mental health problems globally (Nebhinani & Jain, 2019). More specifically, focusing on the population sample for this research study and using the World Health Organization data, statistics state that adolescents between the ages of 10 and 18 are showing a prevalence of mental health issues at 13.9% globally (Yuen et al., 2019). This is an even greater concern, as 50% of adult mental health issues are onset before the individual is aged 18 (Yuen et al., 2019). The World Health Organization (WHO) defines mental health as "a state of well-being in which the individual realizes his or her abilities, can cope with the normal stresses of life, can work productively and fruitfully, and can contribute to his or her community" (WHO, 2004). It involves our psychological, emotional, and social well-being, affecting how we think, feel, and behave. The interest in mental health concerns has risen within the United Kingdom since UNICEF statistics uncovered that the United Kingdom was a wealthy country with significant rising mental health problems within their youth population

(Gunnell et al., 2018; Maughan et al., 2008). Many adolescents currently go untreated or undiagnosed due to the stigma of mental health issues and the fear of the consequences that it may have on their future (Nebhinani & Jain, 2019). The adolescent years are essential for understanding oneself during the neurobiological, psychological, and physiological development phase of life. This is developed within a series of social environments that, if managed carefully, can positively influence adolescents' progress into adulthood (Nebhinani & Jain, 2019). It can also reduce the prevalence of mental health problems among adolescents, eventually leading to 50% of mental health issues found in adults (Yuen et al., 2019). Adolescents who have unipolar depressive disorders are in the highest risk brackets within their age group for deaths related to mental state. Anxiety is also a significant contributor to lower levels of adolescent mental health (Yuen et al., 2019). Normal pressures of life often cause anxiety, and this is observed during the exam years within schooling.

Still, more recently, the development of technology, the vast access that adolescents have, and the time they spend using these devices have led to a greater number of cases of cyberbullying (Skilbred-Fjeld et al., 2020). Ninety-eight percent of adolescents are connected to the internet daily, mainly via social media or communication platforms, which has negatively affected their psychological well-being (Skilbred-Fjeld et al., 2020). Cyberbullying increases the rate of anxiety and depressive symptoms in adolescents, which is a significant factor in the rise in depressive symptoms and anxiety in this population group (Carvalho et al., 2017). It has also been shown to increase low self-esteem, somatization, and hostility in both the victim and the cyberbully

(Skilbred-Fjeld et al., 2020). Cyberbullies are also more likely to display aggressive antisocial behavior in their daily lives and often bully online to increase their social profile. Yet, they are less likely to participate in pro-social activities and behaviors such as sports teams and recreational activities (Campbell et al., 2013). Mental health issues may cause adolescents to adopt risk behaviors. Therefore, they are more likely to have unwanted pregnancies, contract sexually transmitted diseases, experiment with drugs and or alcohol, become involved in crime and or domestic violence, and they are more likely to attempt suicide (Yuen et al., 2019). Children and adolescents are resources to be developed and not problems to be solved (Shek, 2006). Therefore, by creating the right environment from a sporting perspective, coaches can alter the psychological development of adolescents within school sports to reduce the prevalence of mental health issues in future adult lives. Sport for many adolescents is an essential part of this social and developmental phase, giving them an emotional outlet and a physical and social identity. If coaches can create a positive sporting environment where adolescents choose to spend their free time, in a cohesive social environment, this then takes them from their technology and screens where cyberbullying occurs. This will then reduce their exposure to the online world and potential bullying.

The Benefits of School Sports

The benefits of school sports are often discussed openly, and key elements are taken for granted or assumed (Bailey et al., 2009; Bradley & Conway, 2016). Common topics include improved health, developing character and confidence, having an increased positive personal body image, and developing fitness for life which are commonly

discussed phrases that all needed evidence to support their claims (Sabiston et al., 2016). The discussion on the development of school sports has been going on for over a century. The first U.K. guidelines on the inclusion and benefits of sport in schools were written as a syllabus in 1909 (Bailey et al., 2009). At that time, the benefits were split into physical and mental categories. The physical activity assisted in the natural pattern of growth of the child and improved the efficient functioning of the child in the physical activity they performed, and also remedially in posture dysfunctions. The psychological benefits were and continue to be seen as developing discipline, determination, and concentration. Sports are also believed to enable children to improve their moral judgment (Jewett et al., 2014).

The U.K. government began to see physical activity as a way of developing social character. Exercise was portrayed as a means of developing physical robustness within men and being a good mother for women. Physical education sessions then began to take more of a military angle in their formation, which led to the notion that these sessions could develop strong characters, determination, and obedience in men. Between the early 1800s to the 1950s, private schools began to develop the ethics around sports that stated that sport developed character, leadership qualities, deferred gratification, and improved team spirit (Bailey et al., 2009). This perception of the specific areas developed through sport has changed slightly over the century. Nevertheless, the basis of physical and psychological development through sports is still recognized as the core component that school sports programs can improve. Within the early 1980s, there were attempts to teach games for understanding. These games focused on the development of physical

attributes as well as improving skill technique and tactical abilities in-game situations (Bailey et al., 2009). This has generated its own body of research related to this thesis's focus area, transformational leadership coaching. Moxon et al. (2019) stated that through their further review of research literature and the analysis of clinical, epidemiological, meta-analytical, and narrative reviews, moderate physical exercise is shown to benefit pupils psychologically in several ways. Small to moderate benefits from exercise can be seen in reducing anxiety and the reaction to everyday stressors, and additional mild to moderate benefits are seen in reducing mild depression in pupils (Moxon et al., 2019; Shifrer et al., 2012).

A moderate level of physical activity in education has also been shown to positively affect the students' self-esteem, which offers many psychosocial benefits by improving their perceptions, mood, and overall psychological well-being (Shifrer et al., 2012). It has further been shown that school sports can improve the pupils' ability to readjust to changing environments and their cognitive function, which displayed greater academic attainment levels in some studies (Moxon et al., 2019). For those who participate in sports, they are more likely to be accepted into colleges because of their ability to integrate socially and perform at a higher level through the innate competitive traits that they possess, and to stimulate others in their cohorts, which raises performance levels in academia as well as in sports (Shifrer et al., 2012). Universities are also more likely to accept students who play sports as they will have had more adult interaction during their training and be well-rounded individuals (Sabiston et al., 2016; Shifrer et al., 2012).

Leadership Traits

A leader's common traits were widely discussed in the literature. It is a key quality that followers need to be inspired and have reason and drive to work for the focal person. People are said to do what they see (Maxwell, 2013). From a leadership perspective, this means that if leaders are driven and positive, their followers will be. If they are lackluster and demotivated, then the same applies. Followers will emulate the traits and genuine behaviors that their leader displays. Leaders need to ensure that followers are all inspired towards working towards a common goal (Holmes et al., 2010). A good leader is educated and experienced and reflects on their successes and failures to create an environment that inspires and motivates those around them. The most prevalent qualities displayed by the world's most successful leaders and the most commonly cited in the research literature are integrity, the empowerment of others, passion, a strong work ethic, presence, humility, positivity, and uniqueness (Pharion, 2014).

A leader's integrity is a key quality that disappears as soon as the followers question it. Integrity is projected through the leader's actions. The actions need to appear consistent, and the leader must show accountability for their actions at all times (Zaccaro et al., 2018). After consistency, the leader should always be fair and reasonable and show reason and sound judgment for decisions, comments, and actions. Honesty is another vital attribute to integrity which develops trust from the follower and enables them to have confidence that what is said is valid and can be acted upon (Pharion, 2014).

Empowerment of others is a significant attribute of a transformational leader, which gains the followership of the individual. It aligns them with the key objectives of the leader, the group, and the organization (Bass & Riggio, 2006). This empowerment is created by ensuring that the followers have autonomy over certain development parts and feel connected and responsible for the group's direction and progress.

Passion is essential in ensuring that a leader is followed with a similar level of enthusiasm. The passion must be genuine and unquestionable, inspiring others to approach the tasks with the same energy and determination. If this can also be coupled within an eloquent and powerful speaker, this will have a greater inspirational effect on the follower (Zaccaro et al., 2018).

The work ethic of a leader needs to be inspiring and admirable from those who work for the leader to create structure and an organized working environment. If a leader is lazy, cuts corners, or is sluggish in their manner, then, more often than not, employees or athletes will not be inspired by this behavior. This may lead to replicated behavior, more dangerously, however, if the employee or sportsman is driven and wants to achieve great things, the leader's lower work ethic could lead to fractious behavior and resentment (Friedrich et al., 2016). Suppose leaders are focused, organized, and work hard. In that case, this will inspire those around to act in the same way, increase the team's productivity, and develop a collective, energetic culture that is driven to succeed (Zaccaro et al., 2018).

The leader's presence means that they are in the vicinity of the employees or athletes and work *with* them, not above or distant from them. The goals set are common

goals for the group, which they are all striving to achieve and which they understand the value of. The leader needs to be attached to the group and genuinely show that he will be with them through all periods, good or bad and that the focus of the development is as much his issue as it is the group's (Friedrich et al., 2016). A good leader will work hard to understand each team member individually, finding out their needs and what drives them. They will also be compassionate and empathetic, gain the trust of the group, show genuine care and concern for their team, and in this way will develop followership within the group (Friedrich et al., 2016).

Humility is vital in gaining the followership of the team within a transformational leadership setting (Turnnidge et al., 2016). Some leaders offer incentives and dictate goals, specifically within transactional leadership, but this can only drive human nature so far before more than the material or financial gain is needed from the followers. In a transformational coach, followers work to gain confidence and autonomy over their work and feel like they are achieving and adding to the productivity of the team environment. If the coach is humble, this will offer understanding and emotional connection to the group and gain their trust. These leaders will display honest characteristics which show they are human and alike to those that work for them (Frostenson, 2015). They demonstrate knowledge of their limitations and give responsibilities to those who are more experienced and have a higher skill set (Hu et al., 2018). Leaders acknowledge that they make mistakes and accept differences, yet how they manage these issues develops followership in their workforce (Hu et al., 2018).

Positivity allows for an energetic and upbeat working environment motivating those in the group and giving them drive and focus on working in an enjoyable working environment (Baker, 2020). Being a positive leader offers a ‘can-do attitude to the team and construes issues as obstacles to moving around or over to attain the collective goals. Further research discussed that leaders’ positivity must be authentic. Excessive or inauthentic positivity, which credits individuals when nothing has been achieved or attained, can harm employees’ motivation and drive (Alvesson & Einola, 2019).

Uniqueness is the last characteristic which many good leaders possess. Being unique gives the impression that they are genuine, engaging, and passionate about what they are trying to achieve (Randel & Jaussi, 2017). It delivers a message to the group that this person is different from the norm and has thought about what the group is looking to achieve and they are going to achieve it (Randel & Jaussi, 2017).

Perspectives on Leadership

For any leadership style to be effective, the leader, follower, and the relationship between the two must be positive and productive, with both parties focused on achieving the same outcome (Kovach, 2018). Within achievement, goal-orientated environments, the leader is a vital component in determining if the team is successful or fails to reach the set performance goal (Fallesen et al., 2011). Leadership has been defined by Northouse (2016) as a process where an individual can influence others to achieve a common goal, but complete definitions for leadership have not been finalized. Leadership traits and their necessary characteristics can vary depending on the situation in which it is observed (Bass, 2008). There are 221 definitions of leadership and its concepts.

Therefore, it is not viable to narrow it down to one specific term to encompass all leaders (McCleskey, 2014). Researchers have developed various theoretical frameworks to help them better understand what makes an effective leader. These theories are based on understanding the characteristics, traits, values, attitudes, techniques, and strategies of the effective leaders observed (Kovach, 2018). The most prevalent theories of leadership that researchers commonly adopt are the trait theory, behavioral theory, and motivational theory (Bryman et al., 2011). Other less used theories are the path-goal theory, leader-member exchange theory, authentic leadership, servant leadership, transactional leadership, and situational leadership theories (Kovach, 2018). Transformational leadership theory has had the least focus within a sporting context until recently but has been studied within organizational psychology for over two decades.

Trait Theory

One of the earliest writings on leadership was Plato's discussions in the *Republic* around the five types of leaders, written circa 375BC (Bauman, 2018). Many have used these writings as a foundation for leadership theory, with some early documented work being Galton's theory of hereditary genius (1869). This theory discussed the inherited ability to lead as an extraordinary characteristic one possessed over their peers (McCleskey, 2014). This further developed into the great-man theory, the foundation of trait leadership qualities discussed today (McCleskey, 2014). This is the main foundation of the developed trait theory, in which it was argued that all great men and effective leaders possessed the same traits (Northouse, 2016). In initial studies, it was believed that by identifying one particular trait, it could be possible to identify a person who will

become a great leader. Yet, more recent studies on trait theories now focus on a five-factor model, which can be used to identify great leaders. These five traits are neuroticism, extraversion, agreeableness, openness to experiences, and conscientiousness (Judge et al., 2002). Researchers continued to discuss the trait theory and applied it to the outcome behaviors of certain leaders. But some traits led to predictable behavior outcomes, others not. It can be concluded that, although someone may possess the traits, which are admirable by most, these do not essentially develop into the leader displaying behaviors that reflect their traits. Therefore, the correlation between traits forming and resulting in behaviors is not strong enough to deem that traits are why people follow leaders, but more so that behaviors are (Jones & George, 2017).

Behavioral Theory

Certain traits are required for individuals to become good leaders if the traits can lead to admirable and inspiring behaviors to the followers. Researchers have discussed this view for over a century now. Some state that traits alone can be the determining factors of a good leader, while others claim that it must be trait behaviors that develop an effective leader (Jones & George, 2017). Behavioral theories began in the 1940s, and their main focus was on the principle that leaders could be developed through education and instruction (Robbins & Judge, 2017). In the late 1960s, Ohio State University and the University of Michigan researched the understanding of behavioral theories in leadership (Welty Peachey et al., 2015). Both studies resulted in showing that two aspects of leadership were vital: firstly, the development of strong professional relationships between the leader and the employee, through respect and trust. Secondly, the University

of Michigan found that leaders needed to be high in productivity, and lead in their role, by the example of their work ethic and their ability (Welty Peachey et al., 2015). Ohio State found that leaders needed to excel in initiating structure within their departments. Creating structure meant good leaders have a clear identification and description of roles and outline clear expectations, tasks, and desired outcomes (Kovach, 2018).

Situational Leadership Theory

Situation leadership theory focuses on understanding situations and then acting appropriately with the team to accomplish a task. In contrast, the relationship-orientated leader will focus on the team's emotions to reduce conflicting issues that may exist between them and aims to increase the harmony and cohesion of the group, with its goal to boost productivity (McCleskey, 2014). Situational leadership is often classified as a behavioral theory because it requires the leader to understand the issue and then apply appropriate instructions. Situational leaders can do this as they understand the emotions of their followers and can communicate clearly through their relationship, with a solid understanding of the maturity of the individuals they are trying to lead seen as vital in applying the correct style of leadership to the group (McCleskey, 2014). Situational leaders have a high level of confidence and a strong understanding of different situations. They use what they think is the best solution for the team to complete the task (Luo & Liu, 2014). This type of leadership can be seen to be very effective within a military leadership role, which will gain the following and confidence of the fellow soldiers. Still, it is not seen as an effective means of leadership within civilian organizational environments (Van Wert, 2015).

Path-Goal Theory

The path-goal theory is a development from the behavioral theory by Ohio State University during the 1960s (Kovach, 2018). It is a framework based on the leader developing a path for employees and the business to follow. The leader then aligns this with a goal that becomes the team's collective focus (House, 1971). This theory was thought to be effective within a military setting because the leaders create the path for those to follow. This clarifies the situation and enables subordinates to follow clear and predetermined goals. This type of leadership heavily relies on four key behaviors: the leader being supportive but direct in their decision and manner and being participative and goal orientated. This model, however, was only deemed effective if the leader already had the following of the subordinate (Jones & George, 2017).

Authentic Leadership Theory

As its name suggests, this leadership theory is based on the sincerity of the leader, the authenticity of their manner, their exemplary and ethical behavior, to act out positive values and promote others in the workforce or group to positions in which he (genuinely) feels they can be effective (Northouse, 2016). This process develops within the employee trust for the leader, and this, in turn, produces followership. An authentic leader is confident, passionate, and seen to positively act out their ethical values without influence from external sources (Lyubovnikova et al., 2017). This stems from their strong belief in their values. If these are demonstrated, the leader is seen as honest and trustworthy, traits that employees are drawn to follow (Jones & George, 2017).

Servant-Leadership Theory

Greenleaf (1970) developed the servant-leadership theory, which focuses on the sacrifices made by a leader in his interests for the good of his team. This may seem paradoxical because the leader does not lead so much as give up wants in place of what the team needs. The traits often associated with the servant-leadership style are caring, nurturing, empathetic and attentive, which aim to gain the reciprocal reaction from the followers (Northouse, 2016). Building a team that is based on the care for each other results in confidence in the functioning of the team, making all feel included and worthy of their place (Jones & George, 2017).

Leader-Member Exchange Theory

The leader-member exchange theory is based on the leader ensuring that each employee is trusted to run their specific tasks and areas of focus to improve the team's performance. This, in turn, develops job satisfaction, autonomy, accountability, higher employee retention levels, greater attachment to the business, and higher levels of team morale (Omilion-Hodges & Baker, 2017).

Transactional Leadership Theory

Transactional leadership is a leadership style modeled on a rewards-based exchange between the leader and the follower (Bian et al., 2019). The leader will incentivize the worker by setting a task and then offering employee benefits or incentives, which then drives the worker to complete the task. These incentives then allow the leader to accomplish their goals for the business or establishment within their set parameters (Bycio et al., 1995). The employee, sportsman, or worker is motivated to achieve the

defined goals for their gratification or fulfill their own self-interest, and this is shown to reduce anxiety (Bass et al., 2003). Transactional leadership has been shown to be functional for setting short-term goals and maintaining continuous progression. These targets can be adjusted when the objective is met and a new incentive is given (Cho et al., 2019). But there are negative aspects of this leadership style, and these mainly revolve around the shallow or non-existent relationships that leaders have with their employees (Bian et al., 2019). Objectives are set and, if an individual achieves them, they will be rewarded. If they do not reach them, for whatever reason, then they will not be rewarded. This displays a lack of care and empathy for the employee. Nevertheless, the empirical data shows that this is still a productive method of leadership in some domains (Cho et al., 2019).

Sports Coaching, Laissez-Faire Coaching, Toxic Leadership, and Transactional Coaching

Sports Coaching

The role of an effective coach is not just to strive for results but to ensure the holistic development of the sports participant. This requires an ability to socially and emotionally understand those the coach is working with, as well as excellent sport-specific knowledge, with the means and methods of ensuring that this is delivered in a manner that can be absorbed and learned by the participant or team (Gates et al., 2016). The sports coach needs to understand how to transfer this level of knowledge as well as coach the physical skills required within the specific sport, and to be able to instill high levels of integrity within the players, develop positive characters and ensure the

progressive development of the adolescent into their early adult life (Horn, 1987). This holistic development is most effective based on the foundation of positive athlete-coach relationships (Turnnidge et al., 2016).

There are precise levels of sports coaches, from the grassroots beginners to the ultra-elite coach at the Olympic level and professional sport. The need for varying levels of expertise is evident as coaches progress up the ladder. Still, the need to create a positive environment and focus on fundamental areas is vital for all levels of coaching. Depending on the quality of the player, the interpersonal relationship and interactions with the coach, the parents, or the peer group have a significant impact on the positive or negative experiences that players may have during their development (Fraser-Thomas et al., 2005). Within youth-level sport, these interactions can be the main contributing factor that persuades a child to continue with a sport or not (Turnnidge et al., 2016). Within professional sport, the consequences to the players are much greater than just the development of the games and competition. The player's financial security, healthcare, and future are factors that the coach-player relationships can affect. If these are negative, the players are internally conflicted by their lack of desire to play for the team and coach, but the need to remain in the current situation because of life pressures and commitments. (Guilmette et al., 2007).

Some researchers have stated that to be an effective sports coach, the coach must be altruistic and place the team, player, and sports community above their needs to develop a sense of strong community and trust in recognition for this devotion (Miller & Carpenter, 2009). Additional methods of an effective coach are also broadly discussed in

the academic literature. Coaches need to find the balance between criticism and encouragement, create an enjoyable environment and focus on high performance, offer positive reinforcement of performances, and challenge players both physically and mentally (Kassing & Pappas, 2006).

Throughout his research in sports coaching, Professor Jean Côté has led various studies on ascertaining the precise attributes coaches need to ensure they portray to be effective. These findings are the foundation for many of the effective coaching principles used today in many sports and are the basis of further research by coaching academics today. Early in his research career, Côté and Salmela (1996) studied successful high-performance gymnastics coaches, intending to define what qualities coaches needed to be effective at this high level. The key finding from this study was that the coach does not merely teach the individual physical skills and set goals. Still, they communicate with all those who surround the participant to create a supportive 'bubble' in which everyone is focused on developing the single individual. This communication channel is specific to the parents of the participant and the assistants within the coaching squad. Côté and Salmela (1996) found that the coach needs to be both empathetic and sympathetic to the wants and needs of the participant, and listen to concerns, be it from a training perspective, family issues, or academics. This support instills trust in the coach when the participant knows that their coach has authentic and genuine care for the participant.

There were two further findings from this study. Firstly, the coaches need to be in control of the training plan, its frequency, load, timings, and all in conjunction with the other aspects of the participant's life outside of the gymnastic training arena.

Overtraining and fatigue can be an issue at this level of competition, and the participants must be cared for to avoid these. The second aspect is that the coach needs to be fully aware of the physical and mental health of the participant, ensuring that they are healthy in mind and body, eating correctly, and maintaining a healthy weight. Weight in gymnastics was important as correct weight allows optimum performance, but fluctuations above or below can lead to fatigue or movement inefficiency.

Subsequent studies by Côté looked at the behaviors needed by effective coaches in Olympic level rowing. Findings here relate to much of what you would expect from a great high school coach. There were seven main conclusions in this qualitative study when they observed effective coaches. Firstly, coaches need to plan effectively and put this plan into action to ensure the development and progression of the entire group in each session. Secondly, the participants need a positive training environment that is focused and competitive but enjoyable. The participants feed off the energy, passion, and enthusiasm of the coach. Effective goal setting ensured that each athlete knew attainable targets to work towards. This can be understood as ‘collective knowledge so that the coach can support the participants’ quest to achieve these goals. Further to these initial effective practices, it was discussed that the coach must then build the participants’ confidence. This is done in two ways. Firstly, the coach must display a level of self-confidence that the participants can replicate, and secondly, the coach must also personally show their confidence in the participants’ abilities.

Looking at their actual coaching practice methods, effective coaches need to coach skills that engage and create drive from the participants. At the level studied, the

requirement is to get the maximum effort from the rowers so that new, higher performance levels can be reached. This cannot be done in a dictatorial manner. By drawing the participants into the coaching plan, they can gain autonomy over the direction and level of their training. Effective coaches use their emotional intelligence to achieve this level of connection without dictating the session needs (Goleman, 2004). This allows the coach to see individual differences between the participants and how they could be brought together and work most effectively for the team. The final aspect discussed within these findings by Côté is based on the development and understanding of emotional intelligence that ensures coaches have a genuine and engaging positive rapport with each of the rowers.

From these early studies by Côté that correlations between transformational leadership within the business context and effective sports coaching methods were studied and observed. These early findings led to further research into the effectiveness of transformational leadership coaching within the sporting arena.

The collective key finding through this area of research is the importance of positive and effective relationships between the player and the coach, and the coach and the team as a whole (Petitpas et al., 2008). These positive relationships lay the foundations for a team's cohesion, sense of belonging, and community (Henriksen et al., 2010).

Laissez-Faire Coaching

This form of coaching is when the coach is distant and not closely involved in the group environment. It is often termed as 'inactive' and is a style that appears non-leadership (Lefebvre et al., 2019). Laissez-faire coaching methods display a

disengagement from the coach when coaches often delay or fail to complete their typical responsibilities to the players. This may include lack of feedback, or not aiding with requests, or making decisions (Bass & Riggio, 2006). This coaching method does not generate a sense of team between the coaching staff and the players. Instead, it breeds more of a sense of 'us and them,' with the players feeling that the coach does not care about their direction or development. It can be an effective method, but this depends on the team with which it is used (Turnnidge & Côté, 2018). It can be used with effect within high-performance coaching when the players have the knowledge, experience, and autonomy to develop their own game without guidance or input from the coach but is not always a successful approach to elite level coaching (Hayward, 2018). There are too many disadvantages to its use, and it commonly leads to ill-feeling between the leader and the follower group (Lefebvre et al., 2019).

Toxic Leadership

Within leadership, essentially, there is a leader, the followers of the leader, and then the environment in which these interactions take place. For followers to develop, it is perceived that they need encouragement and guidance to improve performance. Yet, some leaders are abusive and highly critical of their followers, which can be detrimental to sports participants' long-term participation and progress (Turnnidge & Côté, 2018). The development of a toxic coaching environment has three causes. The theory is commonly based on a toxic 'triangle,' a framework widely used within organizational psychology (Powers et al., 2016). When dysfunctional coaches or leaders control susceptible participants or followers, it is known as destructive leadership (Saqib & Arif,

2017). The environment itself allows the coach or leader to behave in an ill-manner to control the group. To prevent whistleblowing, the leader will possess charisma (which can also be seen as narcissism) to exert arrogant dominance over the follower in these circumstances (Powers et al., 2016). Another trait which toxic leaders may display is personal abuse of the power they have over their followers. This results in negative or hateful thoughts and feelings from the followers towards the toxic leader and other colleagues, which are known to be behaviors that are destructive to a cohesive environment or group (Kurtulmus, 2019). But the character traits of a toxic leader are not enough to create a poor environment alone. They must have an environment that is itself conducive to their behavior. Still, they must also have followers susceptible to their mannerisms and need to be part of this group to achieve their own perceived goal or development route (Badal, 2019). Commonly, there are two types of followers: conformers and colluders. Colluders have similar thoughts, beliefs, and traits as the leader. Those who follow through fear but are tied to the situation for their gain are termed the Conformers. Conformers are often lower in maturity levels and have poor moral values than those who contest this type of leadership or coaching behavior (Mehta & Maheshwari, 2014). Within sport, players want to achieve their goal of playing for the best team or gaining a professional contract, so the coaches' behavior is something they need to tolerate if they want to achieve this. To opposition or the official, Toxic leadership can often be seen within parental support, which can become abusive to siblings. Possible reasons for this behavior by parents are that they are emotionally invested in their children's progress. Yet, they do not understand the adverse effects and

long-term outcomes this behavior can have on their child (Taylor, 2018). Tragically, toxic coaching behaviors are often replicated by the performer in future years and later life. Because they have endured this as the method of coaching, they replicate it themselves. As such, it needs to be entirely eradicated from the coaching or parental manner (Powers et al., 2016)**.**

Transactional Coaching

As discussed within the organizational leadership styles, transactional leadership is a more active form of leadership than laissez-faire, which was shown to have short-term success but is not conducive to long-term use and development (Turnnidge, 2017). Transactional leadership is a leadership style modeled on a rewards-based exchange between the leader and the follower (Bian et al., 2019). The coach will incentivize the performer by setting a task and then offering benefits or incentives, driving the athlete to complete the task. These incentives then allow the coach to accomplish the goals they have set for the team within their set parameters (Bycio et al., 1995). The employee, sportsman, or worker is then motivated to achieve the set goals for personal gratification or fulfill their self-interest, which reduces anxiety (Bass et al., 2003). Transactional leadership is functional for setting short short-term goals and continuous progression, as these targets can then be adjusted when the objective is met, and a new incentive is given (Cho et al., 2019). Adverse reports on this leadership style revolve around the shallow or non-existent relationships leaders may or may not have with their employees (Bian et al., 2019). Objectives are set, and if an individual achieves them, they will be rewarded. If they do not reach them for whatever reason, then they will not be rewarded. This displays

a lack of care and empathy for the employee, but empirical research demonstrates that this is a productive method of leadership in some domains (Cho et al., 2019).

Transformational Leadership Coaching

Transformational leadership coaching is the process of coaching players to have the abilities and attributes to lead, enabling them to challenge, empower and inspire those around them (Bass & Riggio, 2006). The methods of transformational leadership have been studied within an organizational psychological setting since 1985 when Bass proposed new leadership methods within the industry. This was positively received in a period of wide criticism of organizational transactional leadership methods, which appeared more dictatorial and less intellectually stimulating for employees (Arthur et al., 2017). The first -related research was conducted by Zacharatos et al. (2000). Over the last 20 years, the use of transformational leadership coaching has grown in many sports, as its effectiveness and long-term benefits to participants are more clearly understood. This initial study focused on how transformational leadership from parents manifested itself in the behaviors, actions, and cognitive functioning of their children. In turn, this was shown to be an influential factor within the peer-on-peer sporting context, when children of transformational parents were then transformational leaders on the field or court of sporting competition. The study was conducted on 112 adolescents throughout 13 different sports teams, either single-sex or mixed. The mean age of the participant was 15.19 years (Zacharatos et al., 2000). Various mediators have focused on research within this coaching method to try and understand what makes it so effective. Intrinsic motivation, need satisfaction, and empowerment is the most common mediators studied

and situational moderators of experience in the sport. The teams' performance and narcissism have also been a focus of research (Arthur et al., 2017).

The transformational leadership theory is based on the framework of the follower-centered approach. This approach focuses on the coach developing followers by using inspirational and empowering behaviors with the objective that the coach develops the participants' capabilities to lead (Turnnidge et al., 2016). This is a development from the first steps that Bass and Riggio (2006) took to develop transformational leadership from the transactional stage. Their theory was a person-centered approach, which focused on leaders developing positive working relationships with the participants that inspire, challenge, and empower the follower.

Effective Leadership Behaviors of a Transformational Leadership Coach

Transformational leadership coaching theory is constructed of the 4 'I's of idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Turnnidge et al., 2016). The specific coach behaviors identified with each of the four aspects and should be used within all aspects of their coaching are detailed below.

Idealized Influence

Coaches should genuinely and authentically portray correct prosocial values observed by their participants and all persons involved with the team. The coach's behaviors will be copied by many, so it is vital that they have a strong moral compass and act in a humble, focused, and positive manner. Key examples are simple tasks completed well, such as being organized and on time, engaged in the training, encouraging

participants to work hard to earn a reward, thus seeing improved performance. The coach must remain calm during competitive pressure situations, positively focusing on the team's performance and individuals, not being tempted to be outspoken about others' performances or poor officiation. If others are outspoken, politely addressing the need to remain calm for a positive environment and therefore reduced pressure, being maintained.

Coaches should also show vulnerability and humility, admitting to mistakes when they occur and not blaming others. Idealized influence is based on an effective coach's understanding of their coaching philosophy and who holds true to their values. Becker (2009) conducted a qualitative study involving 18 elite-level athletes, nine males, and nine females, with an average age of 29. These athletes were asked to describe their experiences of coaching excellence, detailing elements of the coaches' performance that made them so effective. This study showed that some distinct characteristics used by transformational leaders were apparent in the perception of effectiveness and success of their favored coaches, these being their ability to develop personal, professional relationships with the players and team. Creating an environment that is stimulating and positively focused, communicating clearly, and ensuring that players are allowed to take ownership of their development. Becker (2009) also discusses that coaches' values should be observed during integration with players, other coaches, and parents. The coach should not falter from them, displaying authentic and genuine passion and care for the players and team. When a coach is firm but fair and consistent in their approach, then players feel secure, and when they know the expectations, they can confidently focus on

their development within the guidance of the coach (Becker, 2009). In true-to-life situations, coaches can display idealized influence by maintaining and discussing personal values. These can include but are not exclusive to good sportsmanship, integrity, humility, and honesty. These values must always be modeled during interactions with the players, and the coach will address those that do not display similar characteristics in a calm and thought-provoking manner. The ability to remain human and show humility is vital as the players will respect and replicate the coach's behavior and how it is performed.

Inspirational Motivation

Inspirational motivation is developed when the coach shows confidence and belief in the performer, encouraging them to perform to the expected high standards (Fraser-Thomas & Côté, 2009). Avolio et al.'s (1991) research showed that the development of this inspirational leadership is derived from personally positive and motivational experiences of the coach, which they then develop into their method of leadership and pass onto their players. Inspirational motivation is also achieved by creating a common goal or shared vision, which the players are inspired by and drive to achieve. Practical methods of improving the inspirational motivation of the teams are sharing a single vision and offering genuine feedback to the players on how to improve their preference within consistent optimistic communication pathways (Turnnidge et al., 2016). Other practical methods shown to be effective are discussing goals and expectations, regularly expressing confidence in the athlete’s potential, promoting team cohesion and the need to

work collaboratively together, and providing clear rationales and explanations for training and performance goals.

Intellectual Stimulation

Intellectual stimulation must be offered to the players to engage and think about their performance direction, choices, and improvements. Players need to be positively challenged with scenarios requiring them to think and develop solutions collectively and as individuals. The effect of increased intellectual stimulation is greater autonomy from the players in overall performance, greater understanding of what they can do on the field of play under pressured conditions, and improved confidence in their abilities without the need to look to coaches for answers. The sum result is an improvement in engagement in training and match setting and the well-being of the player (Mageau & Vallerand, 2003). Practice methods that ensure that players are intellectually stimulated include them in the decision-making processes and ask them to offer suggestions for the session content and how it should be coached. Suppose coaches ask players to develop their idea of how certain play situations can be overcome, coached, and organized. In that case, this stimulates the players' thinking and develops their understanding, and automatically draws them into the process by engaging them. Giving leadership roles to players will also instill greater confidence in them if done regularly. It will develop their ability to lead the team themselves and manage the field of play. Suppose leadership roles and opportunities can be rotated through each of the teams. In that case, the coach will intellectually stimulate each player and develop a whole team of leaders, which is

ultimately the foundation of the transformational leadership theory (Turnnidge et al., 2016).

Individualized Consideration

Individualized consideration improves the enjoyment and commitment of the player to the team. They feel valued in their attendance at sessions and integral to the positive functioning of the team (Stuntz & Spearance, 2010). Within the study conducted by Stuntz and Spearance (2010), 431 youth and collegiate athletes were assessed on the effect of coaches,' and peers' cross-domain knowledge within sport and their home life and other interests on players improved enjoyment of the sport and commitment to the team. It was shown that those coaches and peers who went beyond knowing the player only on the pitch or court were key to the increased enjoyment and commitment of the player. Effective coaches ensure that they have a strong interpersonal relationship with their players, giving them a greater understanding of their needs. This emotional and social intelligence enables them to effectively individualize their coaching behaviors to the different players on the team. This has several positive effects on player development. Improved confidence, collaboration, and commitment are extremely beneficial to the team's overall progress (Erickson et al., 2011). In addition, effective coaches spend time getting to know more about each player. They know about their family situation, what they like to do outside of the sports program, and their other interests. This coaching behavior has been linked to higher levels of enjoyment and commitment from the players (Stuntz & Spearance, 2010). With a more thorough understanding of their players, coaches can adapt sessions to suit their players’ needs, depending on who they are

working with and the extended knowledge they have about the player. They can also try and help players achieve their aims outside of the sports program by setting goals and taking an interest in their progression in these areas (Turnnidge et al., 2016). Other practical measures coaches can take to improve individualized consideration are to understand their players' wants, needs, achievements, and contributions in-depth, enabling them to display authentic empathy for the players' feelings, needs, and concerns.

An effective transformational leadership coach facilitates the personal development of the athlete, improves performance, and increases participation (Turnnidge & Côté, 2017). Transformational leadership can utilize either task-orientated and participant-orientated methods, whereas other leadership theories are only able to follow one or other of these methods (Bass & Riggio, 2006). Research has also shown that transformational leadership methods can overcome the benefits of transactional leadership, which improves the performance satisfaction of the participant or worker (Vecchio et al., 2008). If coaches are successful at using transformational leadership methods, they will be able to raise the participants' levels of motivation in sharp contrast with the methods used within transactional leadership. Coaches are highly influential in the lives and development of athletes of all ages, with the power to influence positively and negatively, which all depends on their approach to athlete development (Turnnidge et al., 2016).

One of the main tenets of transformational leadership coaching that allows it to be more successful is its focus on the coach to develop and understand the participant and create an effective relationship between the two (Côté & Gilbert, 2009). This relationship then

leads to a level of trust between the coach and the performer, with which the coach can play a vital role in the growth of the participant.

Research shows that coaches who develop strong and effective relationships with their players or followers are more likely to achieve success than those that are less emotionally intelligent and more dictatorial. Those good relationships fostered through transformational leadership coaching can essentially lead to superior development and performance (Turnnidge et al., 2016).

Effects of Transformational Leadership on Athletes

Research consistently shows that the positive effects of transformational leadership coaching on performance enhance sports performance, increase the satisfaction of the performer and effectively increase the cohesion of the team. In a study conducted by Alverez et al. (2019), a multilevel SEM was used to assess the effect of transformational leadership coaching on 625 adolescent soccer players between the ages of 16-18, spanning across 50 different Spanish clubs. Their findings reinforced the common perception that transformational leadership coaching develops a positive outlook on task completion, which improves sports performance, player satisfaction, team satisfaction, increased effort, and player perceptions of increased effectiveness of the coach.

Trust

By utilizing transformational leadership coaching, the participants' development of trust in the coach leads them to listen and react to what the coach has stated with a genuine interest and belief that it will enable them to improve their performance and the

teams' outcome (Turnnidge et al., 2016). Smith et al. (2017) conducted a qualitative analysis on 9 English professional county cricket players to understand the factors that make transformational coaches and captains' effective leaders. Their findings showed that high-performance expectations combined with individual consideration for each player were the key elements that inspired the players to progress. The individual consideration was stated to be the daily interactions that the coaches had with the players, which developed trust and loyalty over time that inspired the players to train hard for the coaches and team and improve their performance.

Pride

Participants also develop a sense of pride and attachment to the team when transformational leadership coaching methods are used, which increases the drive to improve their performance for the better of the team (Wang et al., 2005). Chan and Mak (2014) conducted a 2-population study on the relationship between transformational leadership, follower pride, and commitment to the organization. The first population was 145 MBA executive students, and the second, 210 serviced-based employees. All answered the survey questionnaire, which included an introductory section on transformational leadership, outlining the identified practices to be focused on. Further questions were answered on a 3-point scale using the Pride scale (Tyler & Blader, 2002) and the Organizational commitment assessment (Allen & Meyer, 1990). Significant results of transformational leadership leading to improved pride in being the follower and greater organizational commitment were found from both sample population studies.

Empowerment

Empowerment and its relationship to transformational leadership coaching is one aspect that many researchers discuss. Understanding the finer definition of what ‘empowerment is and how it can make the participant think, feel, behave, and perform is important in developing a method that is effective in positively empowering the follower (Barroso Castro et al., 2008). Tsevairidou et al. (2019) conducted a study on 247 sports employees interested in determining the specific psychological effects of transformational leadership coaching on sports employee empowerment. The psychological empowerment instrument of Spriezer (1995) and the Minnesota Satisfaction Questionnaire (MSQ) were used as tools to determine the level of empowerment the sports employees felt during their followership of their transformational leader. The results showed that employee self-determination and empowerment were significantly greater in leaders that focused on transformational leadership, specifically with attention being around the use of idealized influence to empower their followers. This empowerment for the athletes means that their goals are internalized and interpreted so that the follower feels they can make a positive contribution towards achieving them. Athletes have a sense of purpose in the organization's forward movement and feel confident in contributing towards this without restriction or fear of getting it wrong (Barroso Castro et al., 2008). This positive environment and feeling of being empowered lead to a more cohesive culture within the team. This results in further commitment and motivation from the participant as they see

that they are accountable for their actions. These actions will positively or negatively affect the team's overall performance.

Intrinsic Motivation

The overall result of coaching in this way and empowering the individuals and team is the development of higher levels of *intrinsic* motivation and, from greater levels of intrinsic motivation, comes greater performance (Charbonneau et al., 2001). The control from the coach is not one of dictation but more of creating the environment in which the players are confident to make decisions, solve problems together without fear of failure or criticism (Turnnidge et al., 2016).

Mental Toughness

Mental toughness within the use of this research dissertation will follow the construct created by Clough et al. (2002). This construct was based on the three "C"s concept of hardiness. A model is taken from Kobasa's (1979) research, which itself focused on the strength of personality as a key factor in overcoming illness. Kobasa (1979) conceptualized her hardiness model using Commitment, Control, and Challenge. This model was then expanded by Clough et al. (2002), who added Confidence to the construct. This was done to enable their assessment tool, the mental toughness questionnaire 48 (MTQ48), to be conceptualized more accurately (Vaughan et al., 2018).

Mental toughness has been defined as "a personal capacity to deliver high performance regularly, despite varying degrees of situational demands" (Gucciardi & Hanton, 2016). Before this definition, mental toughness was a highly valued concept, but with little detail or clarity around its real meaning (Jones et al., 2002). Through the

progression of research and the need to identify the finer detail of what constitutes mental toughness, researchers are now able to relate this construct to professional and sports performance. Initial studies on mental toughness were based on the personal-constructs theory (Kelly, 1955), which focused on the ability of individuals to create theories developed around scenarios from their own past experiences (Jones et al., 2002). According to its theory, if an outcome was as expected, the individual would continue with this theory in that situation. If an outcome was observed or experienced contrary to expectation, then the individual will revise and alter their theory to suit the outcome (Bannister & Fransella, 1986). This enables the performer to predict outcomes and remains composed when situations occur that they have not previously experienced (Hjelle & Ziegler, 1992).

Mental toughness is thought to be one of the main contributing psychological factors to enable consistency in performance. It allows sports participants to be emotionally stable, creates strong, authentic relationships with their coaches and peers, is rational, remains creative, stays focused, and, finally, performs to their highest level during training and pressured competition (Moran, 2012). Further research has consistently shown that across all the tested sports, the common traits that come under the umbrella of mental toughness are high self-confidence, resilience, unbreakable belief in oneself, personal motivation, and upholding personal values (Vaughan et al., 2018). In a series of five research studies conducted by Gucciardi et al. (2015), a common outcome showed that being able to manage pressure and remain intelligently focused are positive traits that can be observed in those with greater levels of mental toughness among elite-

level sportsmen and women, employees, tertiary students, military personnel and student-athletes. Gucciardi et al. (2020) also studied 122 military recruits during their selection for special forces units. The levels of mental toughness were assessed using a self-report questionnaire, and stress levels were measured biologically by testing for cortisol in 1.5cm hair samples. The results significantly showed that those with higher levels of mental toughness were 68% more likely to pass the selection of the elite force by being more resilient, confident, and self-asserted in their actions.

Initial definitions of mental toughness were of it as a one-dimensional construct, but later researchers largely agreed that it is a multidimensional construct (Hardy et al., 2014) that focuses on the facilitation of the quest, development, and maintenance of excellence within sports performance (McGeown et al., 2016). It is a construct that has been posited by sports coaches and sports psychologists since the turn of the 21st century. It is now collectively considered the most important psychological characteristic of an athlete's development in top-level sport (Crust, 2011; McGeown et al., 2016) as well as the most important factor in those that display success in highly stressful environments (Gucciardi et al., 2015; Jones et al., 2002). Some research has suggested that the traits observed within mental toughness are genetic and comparable to other personality traits which can be found in athletes during their developmental years (Onley et al., 2013). This would indicate that mental toughness is a stable constant that can be malleable or altered during the developmental years through intervention or specific experience (Crust & Clough, 2011). Recent studies have been conducted within a military setting (Fitzwater et al., 2018) and within the sport, specifically, cricket, where mental toughness appeared to

increase when exposed to punishment-conditioned stimuli using a transformational leadership coaching intervention (Subhan et al., 2019). In support of the view that mental toughness can be altered and improved, the development of mental toughness in athletes from a coach's perspective takes considerable and careful thought and may take the form of placing them in scenarios that stretch their coping ability, to teach them to deal with adversity as and when it occurs and to prepare them for competitive situations at the highest level (Weinberg et al., 2016). If this careful consideration is given to athletes' training and development, it is believed that mental toughness can be improved (Weinberg et al., 2016).

The initial four-factor model construct by Clough et al. (2002) was further developed and extended into a six-factor model: the core focal point of Control was split into Life and Emotional Control, Confidence was split into Confidence in One's Abilities and Interpersonal Confidence, in addition to the other two factors of Challenge and Commitment (Perry et al., 2013). Challenge was understood to be how the participant sees a challenge as an opportunity, and Commitment was perceived as what levels of commitment were given to a set task (Posner et al., 2017). The development of the assessment tool for mental toughness began initially with the MTQ48, which is a 48-question questionnaire. Each question is answered on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (Perry et al., 2013).

The mental toughness construct and its MTQ48 assessment have valuable implications, as it allows coaches to focus on or target specific areas of the individual whose MTQ48 assessment scores were low. (Clough & Strycharczyk, 2015). Since there

are six factors that make up mental toughness, and if weaker areas can be specifically trained and improved, then overall mental toughness can be improved. The detailed elements of the construct focus on the thought processes of the individual who is being assessed, and this differs from normal psychometric assessments that normally focus on the way individuals feel and behave (AQR, 2020). Greater levels of mental toughness have also been consistently shown to have a positive effect on mental well-being (Clough et al., 2016), and the practice and coaching methods for improving mental toughness must involve positive thinking, anxiety control, attentional control, goal setting, and visualization (Clough & Strycharczyk, 2015). All of these practices help to reduce the effect of stress and anxiety and improve the mental well-being of the individual so that they are able to cope better with the stressors around them. The overall effect is to improve mental well-being and to reduce burnout (Posner et al., 2017).

Summary and Conclusion

Cases of mental health issues are rising globally among the adolescent population. One in ten children, specifically 13.9% of adolescents globally, have mental health issues or concerns. Research shows that 50% of adults with mental health issues develop the foundations for these issues in their adolescent years. With all this in mind, I have focused on the development of leadership in business and sport, the benefits of school sport, effective coaching styles, and the positive effect that greater mental toughness can have on the adolescent population, improving their mental well-being. Leadership and coaching styles are closely linked. Understanding each participant's needs, motivating, supporting, and developing them are the core skills needed within any successful

management or coaching position. Negative experiences received from some forms of coaching have a lasting effect on the participation and development of the individual.

Transformational leadership is a very effective style of coaching individuals, which empowers them and gives them the tools to improve their performance, be it in the workplace or on the sports field (Turnnidge & Côté, 2017). It is a form of coaching which is said to be "leaders developing leaders." This coaching style has been used within the elite level sport and now, more recently, within youth sports. Transformational leadership coaching focuses on developing coaching styles and initiatives to increase the long-term participation and development of athletes (Turnnidge et al., 2016). Mental toughness is a construct that focuses on an individual's ability to deal with challenges. It assesses their confidence in their abilities, interpersonal confidence, and commitment, and control of their emotions and life. It has been validated and used extensively within sports and adolescent populations.

Research suggests that transformational leadership coaching lends itself to improved mental toughness among adolescent sports participants and that it reduces anxiety and mental illness in this developing population. Still, no research has assessed the effectiveness of transformation leadership coaching on improving mental toughness, a research gap identified by Turnnidge and Côté (2018).

In chapter 3, I outline the structure of the research study, providing information on the sample population, the assessment tools used, the independent and dependent variables, and the research methodology in this quantitative study. I discussed the data

analysis plan using SPSS, threats to validity, and ethical issues observed, offering ways to avoid these conflicts.

Chapter 3: Research Method

The purpose of this quantitative study was to assess the effectiveness of transformational leadership coaching as a strategy for improving mental toughness in school sports participants. In this chapter, I describe the research design and focus on the type of coaching used, the detail surrounding the transformational leadership coaching workshop, the number of participants, and how the research study was structured using the assessment construct of the MTQ48. I also summarize the research questions and hypotheses to allow the reader to relate the design to the study focus. I explain and give reasons for the sampling technique and selection of participants, consisting of boys and staff from a single school in London.

I outline the procedure for the recruitment of the staff and boys so that others may replicate this study, should they wish, in another school or sporting environment. I scrutinize the MTQ48 testing instrument in detail and discuss its validation and reliability within a sporting environment and adolescent population. The results of the MTQ48 for the experimental and control groups were statistically analyzed using SPSS. The desired tests for this cohort size and comparison were a two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8, which focuses on the effect that baseline score, coaching, age and competitive playing level have on changes seen in player mental toughness. This RQ tests the pre-and posttest scores of the control and experimental group. I expected that at the beginning of the study, there would be no difference between the groups, but by the end of the 6 weeks of coaching, those in the

experimental group would have developed higher levels of overall mental toughness, and each factor of the construct would have improved. The latter part of the discussion covers threats to the validity of the research study, and specific measures to cater to these threats are implemented.

Research Design

The study was a quasi-experimental quantitative analysis that assessed the effect of the two-level independent variable, consisting of transformational leadership coaching and traditional methods of sports coaching, on the dependent variable, mental toughness. The study participants consisted of 10 amateur sports coaches within a senior school sporting environment and the pupils they coach in their sporting teams. The total number of coaches recruited for assessment over a 6-week training and competitive period was organized into two groups. One group of five coaches participated in a 4-hour transformational leadership coaching workshop held at the school in the spring term, 2020. The other control group of five coaches did not attend or receive access to information from the coaching workshop.

The workshop session was based on theory and practical application. During the 4-hour workshop, the theory behind transformational coaching was explained. Then, methods by which to apply the theory to a practical coaching environment were discussed and demonstrated. Finally, before the end of the workshop, specific practices of implementing transformational leadership coaching were outlined so that coaches could use these in their training sessions. The coaches selected for the experimental group, who

attended the 4-hour workshop, were given concise guidance on successfully delivering transformational leadership coaching (Appendix C).

The students (14 to18 years of age) of each of the coaches, who participated in the study, answered questionnaires to assess the level of mental toughness using the Mental Toughness Questionnaire 48 (MTQ48). This questionnaire was constructed by Clough et al. (2002) and possesses established psychometric properties, which I discussed in Chapter 2. The test offers excellent reliability and internal consistency (Perry et al., 2013; Zalewska et al., 2019). The dependent variable for this study is the mental toughness of the sport's participants. The coaching style used is the independent variable, which has two levels, transformational leadership, and traditional coaching methods.

The 10 coaches had contact time with their players of at least 6 hours every week, and all coaching took place on Tuesday, Thursday, and Saturday afternoon for 2 hours each session. The time scale of the study was a total of 6 weeks. It started in mid-May when teams were finalized and selected until the final week before the summer break, 6 weeks later. The players selected for the teams of the school sports coaches took the MTQ48 at the beginning and end of the 6-week coaching period. The research was conducted on the sports relevant at the time of IRB approval for the intervention, which was cricket. This study design is in line with other research in this area and is the most appropriate to prove or disprove the research hypotheses.

The research design aimed to identify the differences in mental toughness scores and individual mental toughness factor scores attained by the sport's participants, which relate to the group assignment, the style of sports coaching they received. These coaching

styles were either transformational leadership coaching or the traditional coaching method, with the latter having no prior knowledge or understanding of transformational leadership coaching methods from the workshop. The effect of age and competitive playing level on changes in mental toughness scores from baseline were assessed in the linear multiple regression analysis. The competitive playing level was measured using the annual age group, and the appropriate standard of team participants have been selected to play for by their coaches (e.g., U15A team). The assumption is that these predictors will offer lower rates of improvement of mental toughness from baseline, with older participants being the more experienced and thus have had more exposure to situations that will have improved their mental toughness. In addition to this, the higher competitive performing participants will have had more exposure to situations where mental toughness has developed. It was thought that mental toughness scores would still improve from baseline within the older and or more competitive participants who are coached using transformational leadership methods. Still, the difference in baseline to final assessment scores between this group would be less compared to those of lower playing ability and/or younger participants. This study design choice is consistent with other studies that focus on mental toughness improvements pre- and post-instructional intervention, which employs transformational leadership.

Research Question and Hypothesis

The purpose of this quantitative study is to assess the effectiveness of transformational leadership coaching as a strategy for improving mental toughness in school sports participants.

Research Question 1 (RQ1): Is change in mental toughness score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$1): There is no significant difference in mental toughness score over time as a function of group assignment.

Alternative Hypothesis ($H_1$1): There is a significant difference in mental toughness score over time as a function of group assignment.

Research Question 2 (RQ2): Is change in commitment score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$2): There is no significant difference in commitment change score over time as a function of group assignment.

Alternative Hypothesis ($H_1$2): There is a significant difference in commitment change score over time as a function of group assignment.

Research Question 3 (RQ3): Is change in control (life) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$3): There is no significant difference in control (life) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$3): There is a significant difference in control (life) score over time as a function of group assignment.

Research Question 4 (RQ4): Is change in control (emotion) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$4): There is no significant difference in control (emotion) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$4): There is a significant difference in control (emotion) score over time as a function of group assignment.

Research Question 5 (RQ5): Is change in challenge score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$5): There is no significant difference in challenge score over time as a function of group assignment.

Alternative Hypothesis ($H_1$5): There is a significant difference in challenge scores over time as a function of group assignment.

Research Question 6 (RQ6): Is change in confidence (abilities) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$6): There is no significant difference in confidence (abilities) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$6): There is a significant difference in confidence (abilities) score over time as a function of group assignment.

Research Question 7 (RQ7): Is change in confidence (interpersonal) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$7): There is no significant difference in confidence (interpersonal) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$7): There is a significant difference in confidence (interpersonal) score over time as a function of group assignment.

Research Question 8 (RQ8): Do group assignment, baseline total score, competitive playing level, and age serve as predictors of the final total score.

Null Hypothesis ($H_0$8): None of the variables, group assignment, baseline score, competitive playing level, and age, serve as predictors of the final total score.

Alternative Hypothesis ($H_1$8): At least one of the variables, group assignment, baseline score, competitive playing level, and age, serve as a predictor of the final total score.

Methodology

Sample

All participants within the study are from an inner-city boarding school in London, England. The sports coaches were all teachers who coach sports as part of their job description, and the participants of the school are all boys in the 14 to18 age range. The sample consisted of 10 coaches, five in the control group and five in the experimental group, who adopted transformational leadership coaching methods. Each coach had 12 sports participants whom they coached on a regular basis, totaling 120 sports participants for the study.

As the athletic director, the school I work for conducted this study and agreed for me to use the secondary data for analysis upon approval by the Walden Internal Review Board (IRB). In February 2020, the school hosted a transformational leadership coaching workshop training day for the heads of sports, which benefited the boys and staff in the

school's development of sport and mental well-being. Staff from the school who coach sport were used for the study: five who attended this workshop and five who did not. Those five coaches selected, who attended this workshop, were the experimental group coaches. They were given a guidance sheet by the school sports administrator (Appendix C) to remind them how to coach in a transformational leadership way correctly.

The sport that was running within the school during the time of data collection was cricket. Therefore, the coaches and players were selected from this sport. The pupils of the school who were selected to play this summer sport and were coached by the selected staff were asked to participate in the study. Communication to the boys and staff regarding the study was sent to them by the school sports administrator.

Sampling and Sampling Procedures

A G power analysis was conducted using the G Power 3.1 software (Faul et al., 2007) to find the needed sample size for this research study. The power analysis required the description of the test to be used, the alpha level, desired effect size, statistical power, and the allocation ratio. Statistical analysis for the research questions was a two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8, which focuses on the effect that baseline score, coaching, age, and competitive playing level have on changes seen in player mental toughness To find the required sample size for this study, using the linear multiple regression analysis, the alpha level was set at 0.05, the effect size was set to 0.15, and the power value 0.80.4 predictor

variables consisting of, group assignment, baseline mental toughness score, age, and competitive playing level were set.

I used SPSS to conduct the Statistical analysis. This statistical analysis compared mental toughness scores of both groups before the transformational leadership coaching intervention and post the 6-week coaching period and the individual factors of the mental toughness construct for the same pre- and post-coaching period. The statistical analysis also assessed the predictor variables of age and competitive playing level on the improvements seen from baseline mental toughness scores due to the group assignment. There were approximately 12 boys coached by each staff member, 60 boys assessed in each of the control and experimental group, with a total of 120 boys overall completing the study, which was above the required minimum total of 85 suggested by G power analysis, with at least 43 in each assignment group.

Fitzwater et al. (2018) focused on a transformational coaching intervention for parachute regiment recruits and its effectiveness in improving mental toughness. Their research used the estimated statistical power of G* power 3 (Faul et al., 2007), using the accepted 0.08 or greater, to detect an effect for a sample size between 28 and 237. The sample size used for their research was 171. They conducted an independent *t* test to compare mental toughness scores pretest intervention and posttest with an alpha level of 0.05 and a mixed model ANOVA to determine instructor rate mental toughness scores pre and post-intervention. Madigan and Nicholls (2017) assessed mental toughness and reasons for burnout in adolescent sports participants using multiple regression analysis. They used this to show that higher levels of mental toughness led to reduced levels of

burnout, reduced levels of muscular and emotional fatigue, reduced the rate of negative feelings surrounding participant accomplishment, and reduced the feelings of devaluation over the time period of the study.

Procedure for Recruitment, Participation, and Data Collection.

The school sports administrator was responsible for ensuring that the participants were in the correct teams for their level of ability and sports choice. They also then implemented the MTQ48 to each boy pre and post-the six-week training period. The test was delivered via email from the school sports administrator to the participants, which was accessed via their personal password-protected school computer. This ensured that information was password secured and only completed within the school's protected network. The students took the test during school time. I, the researcher, observed the process and reviewed the raw data, which was provided to me by the school sports coordinator after they received it from the instrument assessment provider. All participants were asked to answer the questions honestly and not to try and predict the desired outcome.

Written permission was obtained from the school’s Headmaster (Principle) in support of conducting the study in this way (see Appendix A). The Walden IRB approved the use of the secondary data for analysis in this study. Within the information sent to the coaches, they were clearly told the outline of the study and to coach in their normal way. They were also told that they could exit the study at any time and that there was no obligation for them to take part.

Instrumentation and Operationalization of Constructs

The test instrument for this research study is the Mental Toughness Questionnaire 48 (MTQ48). This questionnaire was constructed by Clough et al. (2002) and possessed established psychometric properties. The test offers excellent reliability and internal consistency (Perry et al., 2013; Zalewska et al., 2019). The development sample of 963 questionnaires was conducted in the construction of the MTQ48. The population sample covered a wide range of positions with ages between 18-59, with the mean being 24.21 with a standard deviation of 5.23. (Clough et al., 2015). Results were then coded and placed into SPSS, and a data reduction was conducted. The principal components of analysis and varimax rotation were used with eigenvalues greater than one as the only ones accepted (Clough et al., 2015). The reliability of the MTQ48 has been tested. The overall test-retest coefficient is 0.90, which is above that of the minimum acceptable level of 0.7, as stated by Klien (1999) when testing for the reliability of psychological testing tests (Clough et al., 2007). Every single subscale was found to be above this level as well as the test as a whole.

The MTQ48 measures the six subscales of commitment, control (life), control (emotion), challenge, confidence (abilities), and confidence (interpersonal), which are developed using a confirmatory factor analysis (Zalewska et al., 2019). The test uses 48 items within the questionnaire, assessed on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). There are 22 reverse coded items, and the results are polarized. From the 48 questions, eight are based on challenge, 11 on commitment, seven on each of the control subscales, nine on confidence in abilities, and seven on

interpersonal confidence (Clough et al., 2007). The assessment is reliable within global athlete and non-athlete assessments of mental toughness (Vaughan et al., 2018). Recent research has shown that reliable results have been found from assessments conducted on sports players between 14 to17 years of age (Zalewska et al., 2019). This age range and the test environment of sport are relevant for the population sample used within this research study.

The initial four-factor model construct by Clough et al. (2002) was further developed and extended into a six-factor model: the core focal point of Control was split into Life and Emotional Control, Confidence was split into Confidence in One's Abilities and Interpersonal Confidence, in addition to the other two factors of Challenge and Commitment (Perry et al., 2013). Challenge was understood to be how the participant sees a challenge as an opportunity, and Commitment was perceived as what levels of commitment were given to a set task (Posner et al., 2017). The development of the assessment tool for mental toughness began initially with the MTQ48. The factorial validity of the assessment was shown using the confirmatory factor analysis (CFA) and the Exploratory Structural Equation Modeling (ESEM) (Perry et al., 2013). Other variations of the test have also been developed, initially as an MTQ18 and later as the MTQPlus, which is a 74-question assessment tool used mainly with adults (AQR, 2020). The MTQ48 and the MTQ18 have been tested extensively with large populations (n=8207 by Perry et al., 2013) during its validation. Also, in relation to its use within this study, it has been used with adolescent populations. It shows that those who display higher mental toughness scores have lower levels of burnout, are more resilient, and

display lower depressive symptoms than those with lower mental toughness valuations (McGeown et al., 2018).

The results of the MTQ48 test are produced on a scale of 0 to10. The pre and post-test scores for the control and experimental groups will be compared. Professor Clough has granted permission for the use of the MTQ48 within this study, and the letter of permission can be found in Appendix B.

This player MTQ48 assessment will occur before any of the intervention coaching sessions commence in order to assess their mental toughness scores before the start of the coaching period. Participants will then be assessed again at the end of the six-week coaching period, and the two separate scores and their difference will be recorded for statistical analysis. Participants will be debriefed and thanked for their participation in the study at this time. Statistical analysis will be a two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8, which focuses on the effect that baseline score, coaching, age and competitive playing level have on changes seen in player mental toughness. These tests align with previous research on mental toughness and transformational coaching interventions conducted by Fitzwater et al. (2018) and Madigan & Nicholls (2017).

Data Analysis Plan

Research Question and Hypothesis

The purpose of this quantitative study is to assess the effectiveness of transformational leadership coaching as a strategy for improving mental toughness in school sports participants.

Research Question 1 (RQ1): Is change in mental toughness score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$1): There is no significant difference in mental toughness score over time as a function of group assignment.

Alternative Hypothesis ($H_1$1): There is a significant difference in mental toughness score over time as a function of group assignment.

Research Question 2 (RQ2): Is change in commitment score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$2): There is no significant difference in commitment change score over time as a function of group assignment.

Alternative Hypothesis ($H_1$2): There is a significant difference in commitment change score over time as a function of group assignment.

Research Question 3 (RQ3): Is change in control (life) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$3): There is no significant difference in control (life) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$3): There is a significant difference in control (life) score over time as a function of group assignment.

Research Question 4 (RQ4): Is change in control (emotion) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$4): There is no significant difference in control (emotion) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$4): There is a significant difference in control (emotion) score over time as a function of group assignment.

Research Question 5 (RQ5): Is change in challenge score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$5): There is no significant difference in challenge score over time as a function of group assignment.

Alternative Hypothesis ($H_1$5): There is a significant difference in challenge scores over time as a function of group assignment.

Research Question 6 (RQ6): Is change in confidence (abilities) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$6): There is no significant difference in confidence (abilities) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$6): There is a significant difference in confidence (abilities) score over time as a function of group assignment.

Research Question 7 (RQ7): Is change in confidence (interpersonal) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$7): There is no significant difference in confidence (interpersonal) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$7): There is a significant difference in confidence (interpersonal) score over time as a function of group assignment.

Research Question 8 (RQ8): Do group assignment, baseline total score, competitive playing level, and age serve as predictors of the final total score.

Null Hypothesis ($H_0$8): None of the variables, group assignment, baseline score, competitive playing level, and age, serve as predictors of the final total score.

Alternative Hypothesis ($H_1$8): At least one of the variables, group assignment, baseline score, competitive playing level, and age, serve as a predictor of the final total score.

The software used for the statistical analysis was SPSS. The adolescent participants selected for the study were from among the group who were coached by one of the ten selected coaches chosen for the research study. Due to the school where the research is conducted being single sex, all participants were boys. If participants were moved into another team and away from their initial coach, then their analysis was used for the final data input into the SPSS program. Only those that completed the full six weeks under the control of the same coach were asked to complete the second MTQ48 test, and their results will then be compared to their starting MTQ48 test scores.

The results from the MTQ48 test are presented on a scale from 0-10 for each individual who takes the test. Each participant had a test score from pre-coaching and post-coaching experiences. The results from the control group and experimental group were compared using a two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8, which focused on the effect that baseline score, coaching, age and competitive playing level have on changes seen in player mental toughness. It was expected that there would be little to no difference in results between the control and experimental group pre-coaching, but post-coaching, the expectation was to see the experimental group with improved levels of overall mental toughness and its individual factors when compared to the control. This would be the result of transformational leadership coaching.

Threats to Validity

Key areas which may cause threats to validity are the way in which the participants answer the questionnaire. They were asked to answer each question honestly and not predict the desired outcome for their results. Nevertheless, there are protection measures in place within the test that are designed to counter these responses. Overall, its effect on validity is negligible, but it needs to be commented on.

A failure of the coach to adhere to the transformational coaching style was a threat to the outcome of the study. Participants in the experimental group may have received Transformational Leadership coaching methods but may not have responded as well to the coach as desired due to a dysfunctional relationship between both parties,

reducing the effectiveness of the coaching sessions. The coach's role is to create a positive and focused environment, which engages all participants and gives them autonomy over some tasks and their own development.

The coaches' understanding and their use of transformational leadership coaching will itself have influenced the outcome of results. If coaches, who attended the workshop and understood transformational leadership coaching, but who did not use it to its full extent during the six-week training plan, results would be negatively affected. The coaches chosen for the experimental group were ones that have attended and engaged in the workshop. They were given notes and instructions on transformational leadership coaching methods (See appendix C) before their 6-week coaching period for them to refresh their understanding of what was required to coach their sports in this way. The researcher offered supervision and support to the coaches involved in delivering the transformational leadership coaching to ensure consistent and correct application of the theory and practice.

In contrast, some coaches in the control group may naturally have demonstrated some of the key aspects of transformational leadership coaching methods without knowing what they are in theory or how they should be structured in practice. This may have been something as simple as developing strong relationships with the participants so that participants want to work and play under the coaching of the control group teacher.

Ethical Considerations

Before collecting any data or approaching participants for the study, and the Walden University IRB needed to grant ethical approval to allow this study. Permission

was received from the IRB for me to use the schools' secondary data from this coaching intervention for analysis in my study. The school's Head Master agreed and signed the intervention oversight and data sharing agreement (Appendix A). This enabled the school to run the intervention using its staff and students, with myself as the observer using secondary data for analysis. Permission for the use of the MTQ48 assessment instrument in this research has also been granted by Professor Clough of AQR International, who is the founder of the MTQ48 testing instrument.

The organization of the groups and delivery of the questionnaire to their school email account will be conducted by the school sports administrator under the guidance of myself, the researcher, working in relation with AQR international, the instrument holders. This is to ensure that no conflict of interest can occur as I am not the person conducting the process or dealing with the student administration. The results of the MTQ48 tests were observed by me for analysis. These results were sent to the school sports administrator from the instrument provider. They were held on the school database, and secure access was provided for me to analyze the data account, and the names of the participants remain anonymous beyond that of myself. This data will be held for five years as is required by university policy.

Acknowledgment of AQR International's support made for allowing permission for their instrument to be used as the tool for assessment in this research study.

Summary

Chapter 3 provided the purpose of this quasi-experimental quantitative study, the research design, and the selected methodology which would be used to test the

hypothesis. Specifically, the study was designed to find the effectiveness of transformational leadership coaching as a strategy for improving mental toughness in school sports participants. Transformational leadership coaching is a successful coaching strategy for coaches to attain higher performance from elite professional sports participants (Kao & Tsai, 2016). Mental toughness is a successful means of improving the performance and emotional well-being of high school sportsmen and women (Moxon et al., 2019). However, there has been no research that examines whether transformational leadership coaching is an effective platform for improving mental toughness in school sports participants. SPSS is used to statistically assess the quantitative data using a two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8, which focuses on the effect that baseline score, coaching, age and competitive playing level have on changes seen in player mental toughness. In Chapter 4, details concerning data collection and the analysis of results provided by SPSS are discussed.

Chapter 4: Results

The aim of this quantitative study was to identify the differences in mental toughness scores and individual mental toughness factor scores attained by the sport's participants, which related to the group assignment of the style of sports coaching they received. The coaching styles were either transformational leadership coaching or traditional coaching methods. The effect of age and competitive playing level on changes in mental toughness scores from baseline were also assessed in the linear multiple regression analysis discussed within this chapter. The competitive playing level was measured using the annual age group, and the appropriate standard of team participants were selected to play for that team by their coaches (e.g., U15A team). My assumption was that these predictors would offer lower rates of improvement of mental toughness from baseline, with older participants being the more experienced and thus have had more exposure to situations that will have improved their mental toughness. In addition to this, the higher competitive performing participants would have had more exposure to situations where mental toughness has then been developed. It was thought that mental toughness scores would still improve from baseline within the older and/or more competitive participants who were coached using transformational leadership methods, but the difference in baseline to final assessment scores between this group would be less, compared to those of lower playing ability and/or younger participants. This study design is consistent with other studies that focus on mental toughness improvements pre- and post a coaching style intervention, which employs transformational leadership.

Within Chapter 4, I present the research questions and hypotheses. I also describe

the data collection process, offer a detailed evaluation of the assumptions of statistical analysis and the results shown from SPSS, which statistically assesses the quantitative data using a two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8, which focuses on the effect that baseline score, coaching, age and competitive playing level have on changes seen in player mental toughness. I have used the following research questions for this study.

Research Question 1 (RQ1): Is change in mental toughness score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$1): There is no significant difference in mental toughness score over time as a function of group assignment.

Alternative Hypothesis ($H_1$1): There is a significant difference in mental toughness score over time as a function of group assignment.

Research Question 2 (RQ2): Is change in commitment score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$2): There is no significant difference in commitment change score over time as a function of group assignment.

Alternative Hypothesis ($H_1$2): There is a significant difference in commitment change score over time as a function of group assignment.

Research Question 3 (RQ3): Is change in control (life) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$3): There is no significant difference in control (life) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$3): There is a significant difference in control (life) score over time as a function of group assignment.

Research Question 4 (RQ4): Is change in control (emotion) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$4): There is no significant difference in control (emotion) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$4): There is a significant difference in control (emotion) score over time as a function of group assignment.

Research Question 5 (RQ5): Is change in challenge score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$5): There is no significant difference in challenge score over time as a function of group assignment.

Alternative Hypothesis ($H_1$5): There is a significant difference in challenge scores over time as a function of group assignment.

Research Question 6 (RQ6): Is change in confidence (abilities) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$6): There is no significant difference in confidence (abilities) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$6): There is a significant difference in confidence (abilities) score over time as a function of group assignment.

Research Question 7 (RQ7): Is change in confidence (interpersonal) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Null Hypothesis ($H_0$7): There is no significant difference in confidence (interpersonal) score over time as a function of group assignment.

Alternative Hypothesis ($H_1$7): There is a significant difference in confidence (interpersonal) score over time as a function of group assignment.

Research Question 8 (RQ8): Do group assignment, baseline total score, competitive playing level, and age serve as predictors of the final total score.

Null Hypothesis ($H_0$8): None of the variables, group assignment, baseline score, competitive playing level, and age, serve as predictors of the final total score.

Alternative Hypothesis ($H_1$8): At least one of the variables, group assignment, baseline score, competitive playing level, and age, serve as a predictor of the final total score.

Data Collection

Data collection began at 8:30 am on the 17th of May and ended on Friday the 25th of June at 5 pm. As described in Chapter 3, data collection was conducted by the sports administration assistant employed at the school I work at. The Headmaster granted permission for the study to occur at his school, using the students under his supervision. I

was granted permission from the Walden IRB and the school Headmaster to use the data as a secondary source for analysis within this study.

One hundred and twenty students were initially sent the questionnaire. This total cohort was constructed of 60 students that were coached using transformational leadership coaching methods and 60 that were coached using traditional sports coaching methods. The students' ages ranged from 18 to 14, and their playing standard varied from the top teams to the 5th team or E teams. From the original 120, 108 students responded to the first questionnaire, 58 from the transformational leadership coaching group, and 50 from the traditional coaching group. For the second mental toughness assessment at the end of the coaching intervention, the 108 students that answered the first assessment questionnaire were sent the second test. Of these participants, 96 responded to the second questionnaire, 53 from the transformational leadership group and 43 from the traditional coaching group.

Results Analysis

Descriptive statistics for the sample and the results of the two-way repeat measures ANOVA (mixed model ANOVA) tests to assess change over time as a function of the group for RQs one through seven and linear multiple regression analysis for RQ8.

Within the tables below, I have calculated the mean score and standard deviation for the full cohort group and individually for the transformational leadership and traditional coaching groups. The results have been calculated pre- and post-coaching intervention which allows my interpretation of simple increases or decreases in mean scores.

Descriptive Statistics

Table 1

Descriptive Statistics for Total and Subscale Scores for the Full Cohort – Pre-Coaching Intervention

Variable	N	Mean	SD
Mental Toughness total score	96	4.96	1.79
Emotional control	96	5.07	1.69
Life control	96	4.45	1.78
Commitment	96	4.15	1.86
Challenge	96	4.56	1.86
Confidence in abilities	96	4.81	2.11
Interpersonal confidence	96	4.65	1.79

Table 2

Descriptive Statistics for Total and Subscale Scores for the Full Cohort – Post- Coaching Intervention

Variable	N	Mean	SD
Mental Toughness total score	96	4.98	1.86
Emotional control	96	4.86	1.71
Life control	96	4.57	1.83
Commitment	96	5.11	1.96
Challenge	96	4.50	1.97
Confidence in abilities	96	4.97	2.02
Interpersonal confidence	96	4.85	1.72

Table 3

Descriptive Statistics for Total and Subscale Scores for the Transformational Leadership Coaching Group – Pre-Coaching Intervention

Variable	N	Mean	SD
Mental Toughness total score	53	5.07	1.75
Emotional control	53	5.09	1.69
Life control	53	4.47	1.76
Commitment	53	5.45	1.84
Challenge	53	4.77	1.80
Confidence in abilities	53	4.92	2.10
Interpersonal confidence	53	4.37	1.75

Table 4

Descriptive Statistics for Total and Subscale Scores for the Transformational Leadership Coaching Group – Post-Coaching Intervention

Variable	N	Mean	SD
Mental Toughness total score	53	5.36	1.81
Emotional control	53	5.13	1.67
Life control	53	4.79	1.78
Commitment	53	5.57	1.88
Challenge	53	4.66	1.90
Confidence in abilities	53	5.19	1.94
Interpersonal confidence	53	4.74	1.70

Table 5

Descriptive Statistics for Total and Subscale Scores for the Traditional Coaching Group – Pre-Coaching Intervention

Variable	N	Mean	SD
Mental Toughness total score	43	4.81	1.79
Emotional control	43	5.05	1.68
Life control	43	4.42	1.65
Commitment	43	4.77	1.85
Challenge	43	4.30	1.82
Confidence in abilities	43	4.67	2.10
Interpersonal confidence	43	4.98	1.86

Table 6

Descriptive Statistics for Total and Subscale Scores for the Traditional Coaching Group – Post-Coaching Intervention

Variable	N	Mean	SD
Mental Toughness total score	43	4.51	1.79
Emotional control	43	4.56	1.58
Life control	43	4.03	1.67
Commitment	43	4.56	1.84
Challenge	43	4.30	1.86
Confidence in abilities	43	4.70	2.04
Interpersonal confidence	43	5.00	1.70

Assumptions for normality were assessed using the Shapiro-Wilk test, and homogeneity was tested using Levene's test for Homogeneity. I compared the resulting values for kurtosis and skewness to the guidelines to decipher if there was a data distribution that differed from a normal distribution. To note, using the ANOVA allows for assumptions to be made about the normality to be approximately normally distributed. The two-way repeat measures ANOVA is a robust test with regards to violations to normality, meaning that in the case of these results, the factors which are close to normality can still be seen as providing valid results (Field,2018). Histograms were used to depict the curve of distribution, showing that it is close to normal.

Figure 1

Descriptive Statistics and tests of normality overview.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
MTQ48 overall - 1	96	1	10	4.96	1.794	.354	.246	.147	.488
MTQ48 overall - 2	96	1	10	4.98	1.864	.131	.246	-.175	.488
Emotional Control - 1	96	2	9	5.07	1.687	.353	.246	-.690	.488
Emotional Control -2	96	2	9	4.88	1.712	.507	.246	.019	.488
Life control - 1	96	1	9	4.45	1.776	.720	.246	.337	.488
Life control - 2	96	1	10	4.57	1.828	.710	.246	.145	.488
Commitment - 1	96	1	10	5.15	1.864	.042	.246	-.187	.488
Commitment - 2	96	1	10	5.11	1.957	.146	.246	.153	.488
Challenge - 1	96	1	10	4.56	1.863	.444	.246	.122	.488
Challenge - 2	96	1	10	4.50	1.974	.516	.246	.137	.488
Confidence in abilities - 1	96	1	10	4.81	2.114	.525	.246	-.275	.488
Confidence in abilities - 2	96	1	10	4.97	2.018	.287	.246	-.377	.488
Interpersonal confidence - 1	96	1	10	4.65	1.789	.303	.246	.296	.488
Interpersonal confidence - 2	96	1	9	4.85	1.717	.231	.246	.185	.488
Valid N (listwise)	96								

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MTQ48 overall - 1	.137	96	<.001	.961	96	.006
MTQ48 overall - 2	.127	96	<.001	.972	96	.037
Emotional Control - 1	.185	96	<.001	.942	96	<.001
Emotional Control -2	.216	96	<.001	.919	96	<.001
Life control - 1	.183	96	<.001	.930	96	<.001
Life control - 2	.186	96	<.001	.932	96	<.001
Commitment - 1	.116	96	.003	.970	96	.027
Commitment - 2	.138	96	<.001	.965	96	.011
Challenge - 1	.157	96	<.001	.959	96	.004
Challenge - 2	.140	96	<.001	.952	96	.001
Confidence in abilities - 1	.191	96	<.001	.939	96	<.001
Confidence in abilities - 2	.154	96	<.001	.950	96	.001
Interpersonal confidence - 1	.140	96	<.001	.962	96	.007
Interpersonal confidence - 2	.133	96	<.001	.958	96	.004

a. Lilliefors Significance Correction

Two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQ1 - Is change in mental toughness score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Figure 2

Descriptive Statistics for RQ1.

Descriptive Statistics

	Cohort	Mean	Std. Deviation	N
MTQ48 overall - 1	Traditional	4.81	1.955	43
	Transformational	5.08	1.662	53
	Total	4.96	1.794	96
MTQ48 overall - 2	Traditional	4.51	1.869	43
	Transformational	5.36	1.788	53
	Total	4.98	1.864	96

There is a significant interaction term between the two cohort groups and the before and after times.

Tests of Within-Subjects Effects

Measure: MT

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	.004	1	.004	.015	.901	.000
	Greenhouse-Geisser	.004	1.000	.004	.015	.901	.000
	Huynh-Feldt	.004	1.000	.004	.015	.901	.000
	Lower-bound	.004	1.000	.004	.015	.901	.000
time * Cohort	Sphericity Assumed	4.067	1	4.067	14.205	.000	.131
	Greenhouse-Geisser	4.067	1.000	4.067	14.205	.000	.131
	Huynh-Feldt	4.067	1.000	4.067	14.205	.000	.131
	Lower-bound	4.067	1.000	4.067	14.205	.000	.131
Error(time)	Sphericity Assumed	26.912	94	.286			
	Greenhouse-Geisser	26.912	94.000	.286			
	Huynh-Feldt	26.912	94.000	.286			
	Lower-bound	26.912	94.000	.286			

Pairwise Comparisons

Measure: MT

(I) Cohort	(J) Cohort	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Traditional	Transformational	-.554	.364	.131	-1.276	.168
Transformational	Traditional	.554	.364	.131	-.168	1.276

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Pairwise Comparisons

Measure: MT

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a] Lower Bound	Upper Bound
1	2	.010	.078	.901	-.145	.164
2	1	-.010	.078	.901	-.164	.145

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

The above pairwise comparisons show no difference in the means of the two cohorts or in the means of the two time periods. However, the interaction term shows significant differences between the cohorts across time. The traditional methods have shown a decrease and the transformational, an increase in mental toughness.

Pairwise Comparisons

Measure: MT

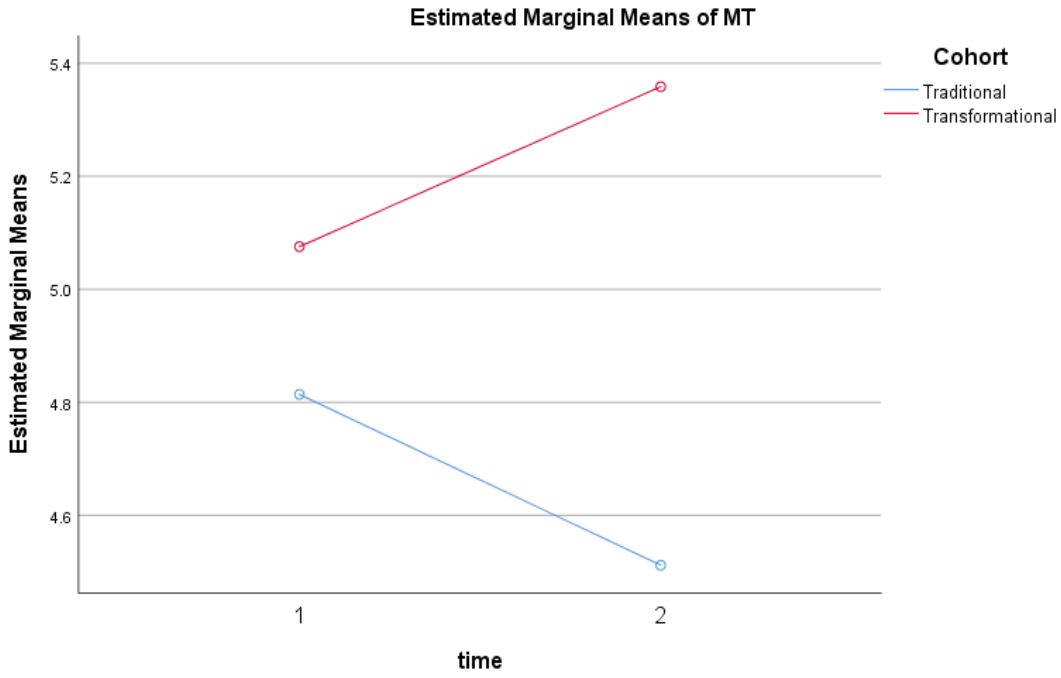
Cohort	(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
Traditional	1	2	.302*	.115	.010	.073	.531
	2	1	-.302*	.115	.010	-.531	-.073
Transformational	1	2	-.283*	.104	.008	-.489	-.077
	2	1	.283*	.104	.008	.077	.489

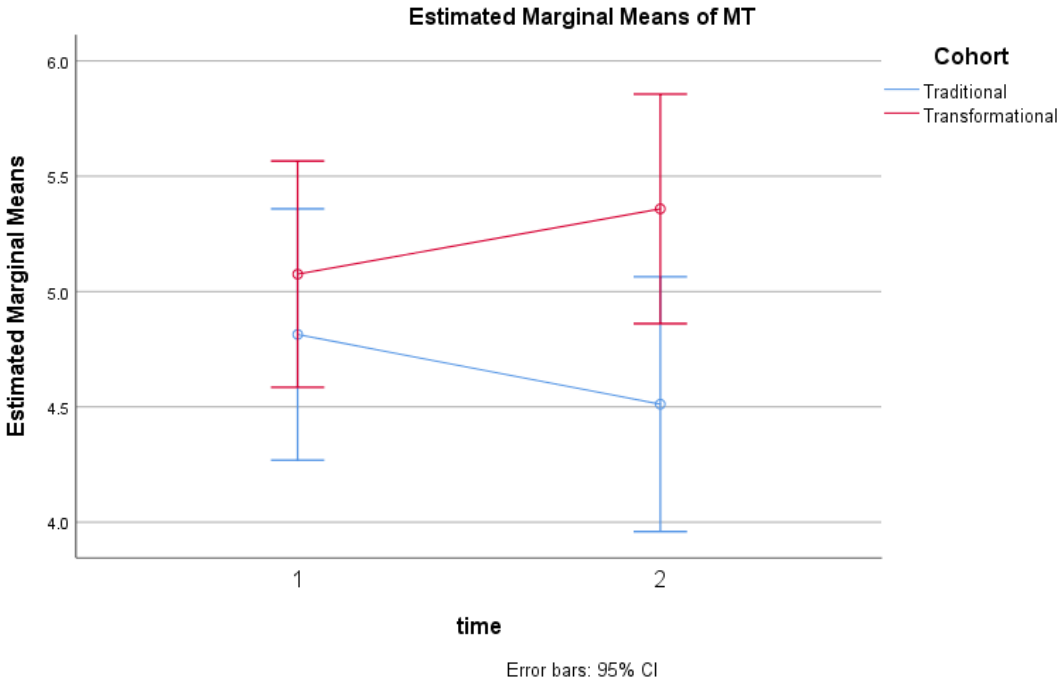
Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

There is a difference of 0.585 between the two cohorts over time which is depicted in the following graphs:


Estimated Marginal Means of MT
Estimated Marginal Means
5.4
5.2
5.0
4.8
4.6
1
2
time
Cohort
Traditional
Transformational


Estimated Marginal Means of MT
Estimated Marginal Means
6.0
5.5
5.0
4.5
4.0
1
2
time
Cohort
Traditional
Transformational
Error bars: 95% CI

Assumptions:

Box's and Levine's tests were both passed. There is no need for sphericity tests due to there only being two time points.

Box's Test of Equality of Covariance Matrices[a]

Box's M	3.100
F	1.009
df1	3
df2	3569101.020
Sig.	.387

This tests the null hypothesis, that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Cohort

Within Subjects Design: time

Levene's Test of Equality of Error Variances

		Levene Statistic	df1	df2	Sig.
MTQ48 overall - 1	Based on Mean	.276	1	94	.601
	Based on Median	.264	1	94	.609

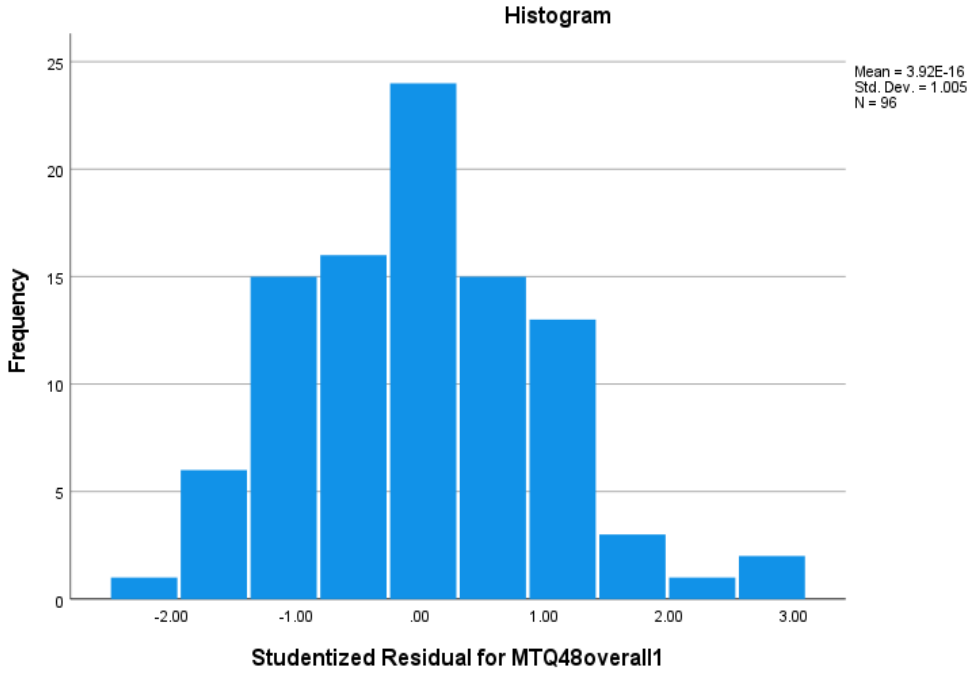
	Based on Median and with adjusted df	.264	1	87.276	.609
	Based on trimmed mean	.329	1	94	.568
MTQ48 overall - 2	Based on Mean	.015	1	94	.903
	Based on Median	.171	1	94	.680
	Based on Median and with adjusted df	.171	1	88.880	.680
	Based on trimmed mean	.0 26	1	94	.872

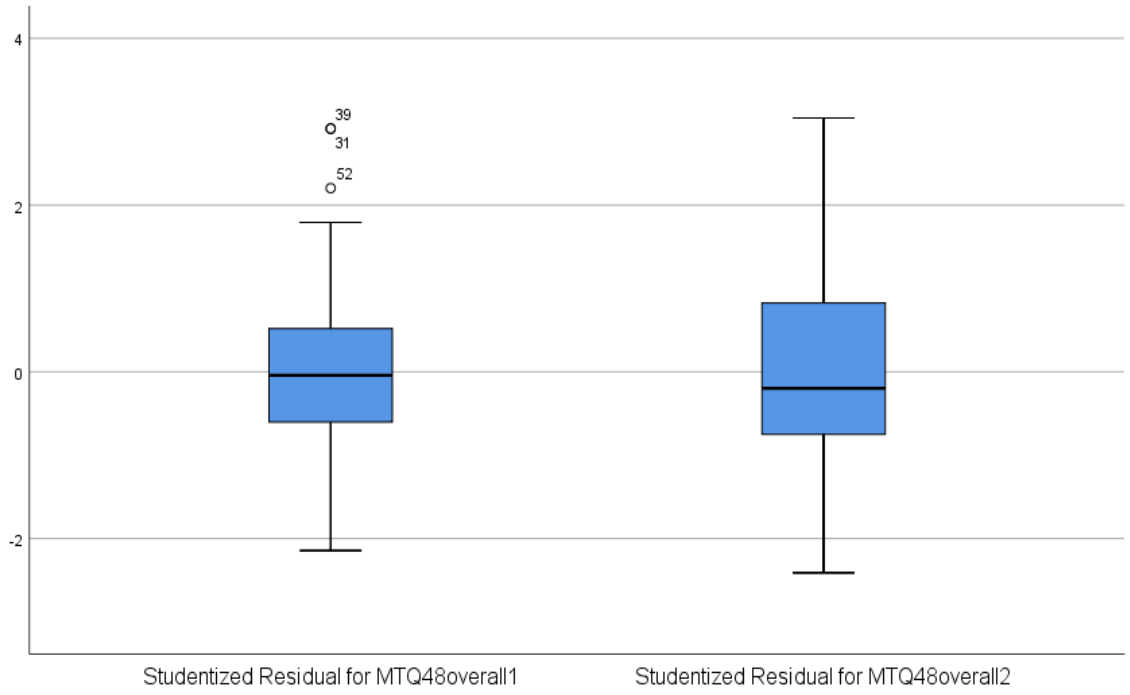
The normality of the produced residuals fails for the ‘before’ group due to 3 outliers. This is very close to the 5% level and does not invalidate the analysis due to the robust nature of the ANOVA and the large sample size (Field, 2018). The histogram visually indicates normality (or close to normality).

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Studentized Residual for MTQ48overall1	.104	96	.012	.972	96	.039
Studentized Residual for MTQ48overall2	.120	96	.002	.977	96	.089

a. Lilliefors Significance Correction





Outliers 31, 39, and 52 are the outliers, with the before and after scores:

Traditional	U15	D	19Othm	10	8
Traditional	U14	C	20Oliv	10	10
Transformational	U18	A	18Rawa	9	9

It was decided that the outliers would remain as they are still part of the cohort group assessed, and it is not possible to clearly decipher if they have incorrectly answered the assessments questionnaires. As results for this analysis are close to normality, the significance value of 0.039 was accepted.

This accepts the alternate hypothesis that there is a significant difference in Mental toughness score over time as a function of group assignment.

Two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQ2: Is change in commitment score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Figure 3

Descriptive Statistics for RQ2.

Descriptive Statistics

	Cohort	Mean	Std. Deviation	N
Commitment - 1	Traditional	4.77	1.925	43
	Transformational	5.45	1.771	53
	Total	5.15	1.864	96
Commitment - 2	Traditional	4.56	1.856	43
	Transformational	5.57	1.937	53
	Total	5.11	1.957	96

Tests of Within-Subjects Effects

Measure: COM

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	.110	1	.110	.141	.708	.001
	Greenhouse-Geisser	.110	1.000	.110	.141	.708	.001
	Huynh-Feldt	.110	1.000	.110	.141	.708	.001
	Lower-bound	.110	1.000	.110	.141	.708	.001
time * Cohort	Sphericity Assumed	1.235	1	1.235	1.585	.211	.017
	Greenhouse-Geisser	1.235	1.000	1.235	1.585	.211	.017
	Huynh-Feldt	1.235	1.000	1.235	1.585	.211	.017
	Lower-bound	1.235	1.000	1.235	1.585	.211	.017
Error(time)	Sphericity Assumed	73.219	94	.779			
	Greenhouse-Geisser	73.219	94.000	.779			
	Huynh-Feldt	73.219	94.000	.779			
	Lower-bound	73.219	94.000	.779			

There is no significant interaction term between time and cohort. However, there is a significant difference between the traditional and transformational cohorts. The

transformational group has a significantly higher mean irrespective of the time period than the traditional for their commitment. This may be a result of the level of the teams that were assigned to the transformational group, as they tend to be teams of a higher standard.

Pairwise Comparisons

Measure: COM

(I) Cohort	(J) Cohort	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Traditional	Transformational	-.847*	.362	.022	-1.566	-.128
Transformational	Traditional	.847*	.362	.022	.128	1.566

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

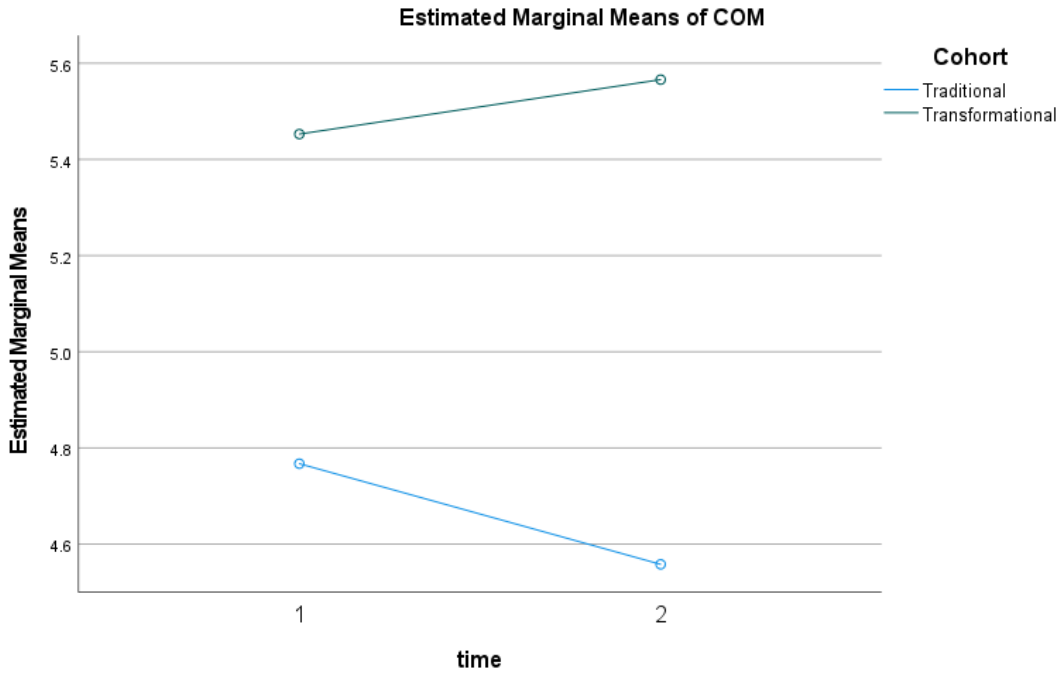
Pairwise Comparisons

Measure: COM

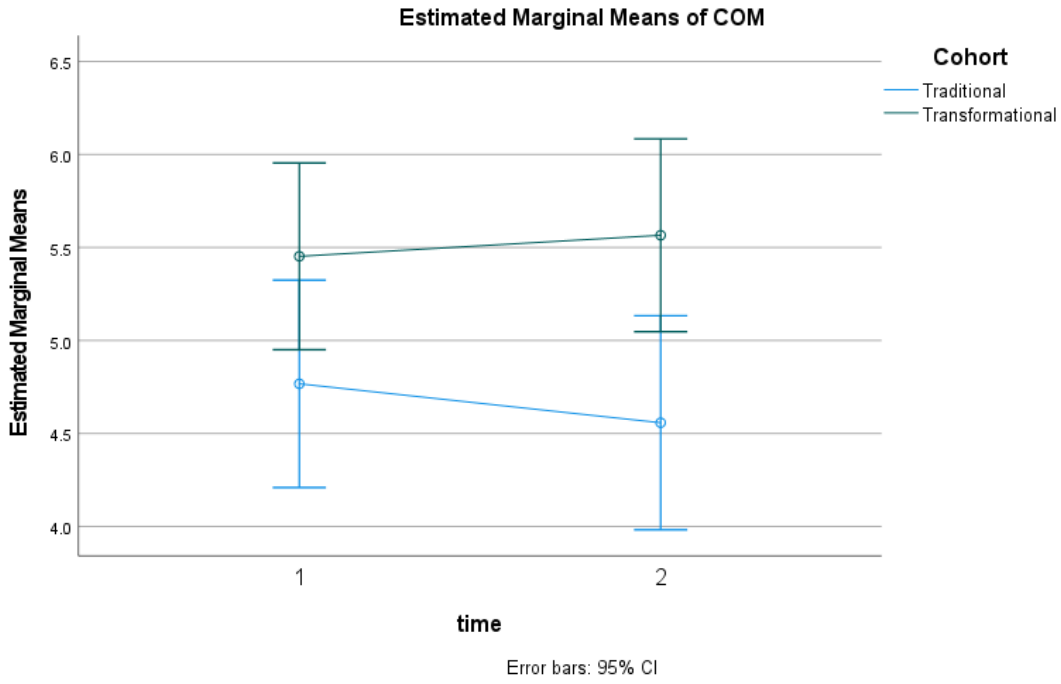
(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	.048	.128	.708	-.206	.302
2	1	-.048	.128	.708	-.302	.206

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.



The graphs show a trend in improvement in the transformational group, but the study is not large enough or taken over a long enough period of time to pick up any potential difference.



This fails to reject the null hypothesis. There is no significant difference in commitment change score over time as a function of group assignment.

Two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQ3: Is change in control (life) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Figure 4

Descriptive Statistics for RQ3.

Descriptive Statistics

	Cohort	Mean	Std. Deviation	N
Life control - 1	Traditional	4.42	1.607	43
	Transformational	4.47	1.918	53
	Total	4.45	1.776	96
Life control - 2	Traditional	4.30	1.670	43
	Transformational	4.79	1.935	53
	Total	4.57	1.828	96

Tests of Within-Subjects Effects

Measure: LC

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	.496	1	.496	.543	.463	.006
	Greenhouse-Geisser	.496	1.000	.496	.543	.463	.006
	Huynh-Feldt	.496	1.000	.496	.543	.463	.006
	Lower-bound	.496	1.000	.496	.543	.463	.006
time * Cohort	Sphericity Assumed	2.267	1	2.267	2.479	.119	.026
	Greenhouse-Geisser	2.267	1.000	2.267	2.479	.119	.026
	Huynh-Feldt	2.267	1.000	2.267	2.479	.119	.026
	Lower-bound	2.267	1.000	2.267	2.479	.119	.026
Error(time)	Sphericity Assumed	85.983	94	.915			
	Greenhouse-Geisser	85.983	94.000	.915			
	Huynh-Feldt	85.983	94.000	.915			
	Lower-bound	85.983	94.000	.915			

There is no significant interaction term, and the pairwise comparisons show no difference in before and after scores for the cohorts nor the times.

Pairwise Comparisons

Measure: LC

(I) Cohort	(J) Cohort	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Traditional	Transformational	-.272	.343	.431	-.953	.410
Transformational	Traditional	.272	.343	.431	-.410	.953

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Pairwise Comparisons

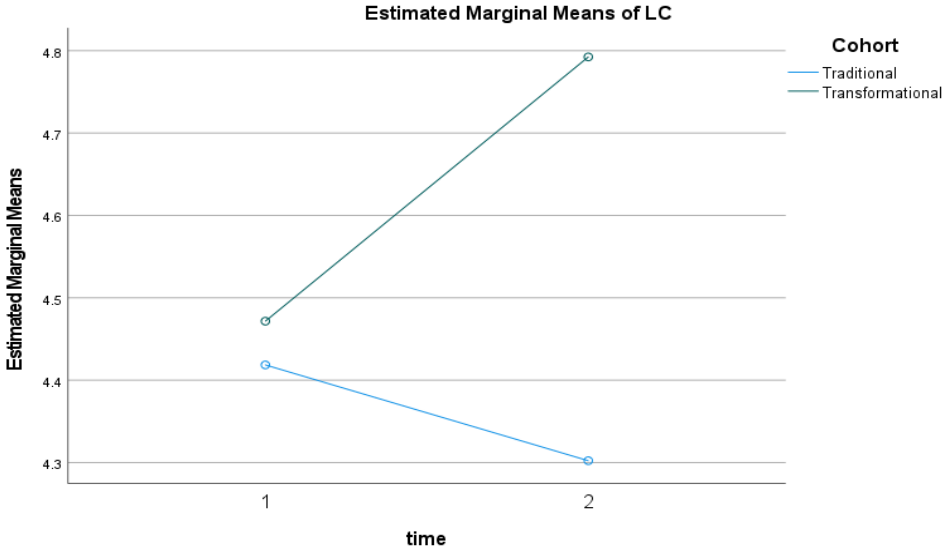
Measure: LC

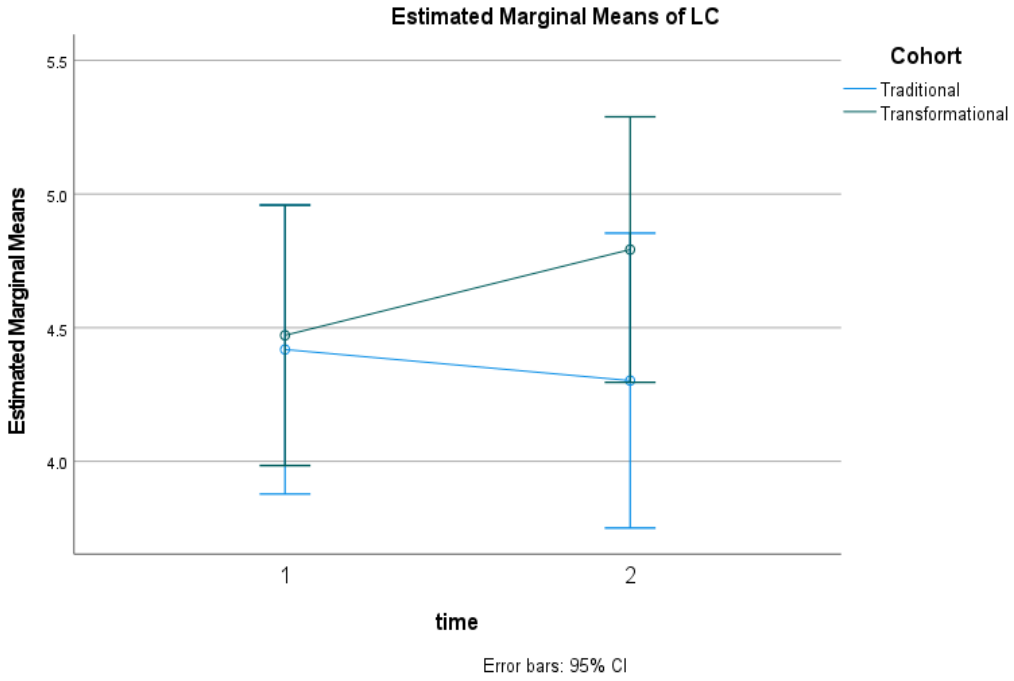
(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	-.102	.139	.463	-.378	.173
2	1	.102	.139	.463	-.173	.378

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Although not significant, the graph shows that an expanded trial might show a significant effect indicating that transformational leadership coaching can make a big difference in life control.





This fails to reject the null hypothesis. There is no significant difference in control (life) score over time as a function of group assignment.

Two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQ4: Is change in control (emotion) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Figure 5

Descriptive Statistics for RQ4

Descriptive Statistics

	Cohort	Mean	Std. Deviation	N
Emotional Control - 1	Traditional	5.05	1.731	43
	Transformational	5.09	1.667	53
	Total	5.07	1.687	96
Emotional Control -2	Traditional	4.56	1.680	43
	Transformational	5.13	1.710	53
	Total	4.88	1.712	96

There is a significant interaction term between the two cohort groups and the before and after times.

Tests of Within-Subjects Effects

Measure: EC

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	2.410	1	2.410	3.884	.052	.040
	Greenhouse-Geisser	2.410	1.000	2.410	3.884	.052	.040
	Huynh-Feldt	2.410	1.000	2.410	3.884	.052	.040
	Lower-bound	2.410	1.000	2.410	3.884	.052	.040
time * Cohort	Sphericity Assumed	3.285	1	3.285	5.294	.024	.053
	Greenhouse-Geisser	3.285	1.000	3.285	5.294	.024	.053
	Huynh-Feldt	3.285	1.000	3.285	5.294	.024	.053
	Lower-bound	3.285	1.000	3.285	5.294	.024	.053
Error(time)	Sphericity Assumed	58.334	94	.621			
	Greenhouse-Geisser	58.334	94.000	.621			
	Huynh-Feldt	58.334	94.000	.621			
	Lower-bound	58.334	94.000	.621			

The pairwise comparisons show no differences in means between the cohorts or the time periods, which is very close to the 5% level.

Pairwise Comparisons

Measure: EC

(I) Cohort	(J) Cohort	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Traditional	Transformational	-.311	.329	.347	-.964	.342
Transformational	Traditional	.311	.329	.347	-.342	.964

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Pairwise Comparisons

Measure: EC

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	.225	.114	.052	-.002	.452
2	1	-.225	.114	.052	-.452	.002

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

For the interaction term, a difference can be seen:

Pairwise Comparisons

Measure: EC

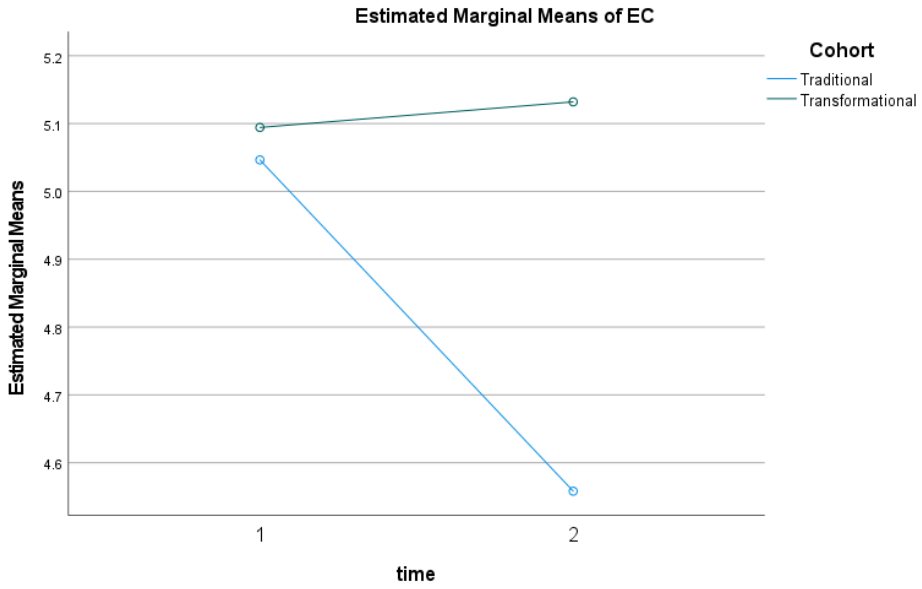
Cohort	(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
						Lower Bound	Upper Bound
Traditional	1	2	.488*	.170	.005	.151	.826
	2	1	-.488*	.170	.005	-.826	-.151
Transformational	1	2	-.038	.153	.806	-.342	.266
	2	1	.038	.153	.806	-.266	.342

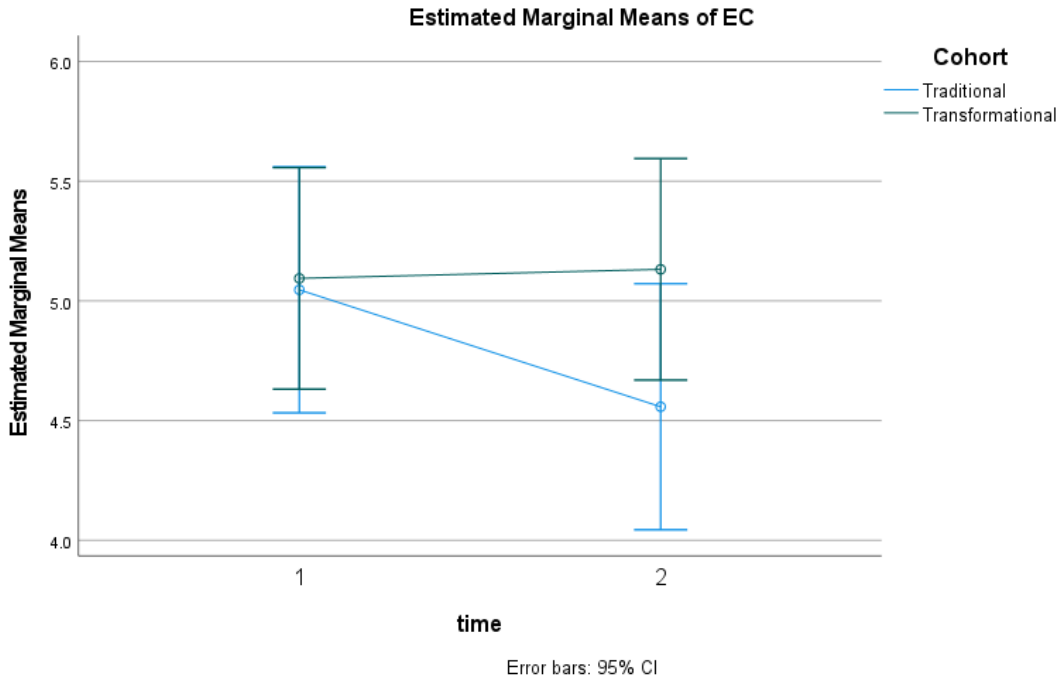
Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

This shows that the drop in EC for the traditional cohort is responsible for the difference. It appears that there is a significant drop in this cohort group whilst the transformational group has made a slight but not significant increase—a difference of 0.526.





Assumptions

Box's and Levine's tests are passed.

Box's Test of Equality of Covariance Matrices[a]

Box's M	1.213
F	.395
df1	3
df2	3569101.020
Sig.	.757

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Cohort
Within Subjects Design: time

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
Emotional Control - 1	Based on Mean	.244	1	94	.622
	Based on Median	.270	1	94	.605
	Based on Median and with adjusted df	.270	1	93.789	.605
	Based on trimmed mean	.205	1	94	.652
Emotional Control -2	Based on Mean	.098	1	94	.755
	Based on Median	.518	1	94	.473
	Based on Median and with adjusted df	.518	1	88.684	.473
	Based on trimmed mean	.133	1	94	.716

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

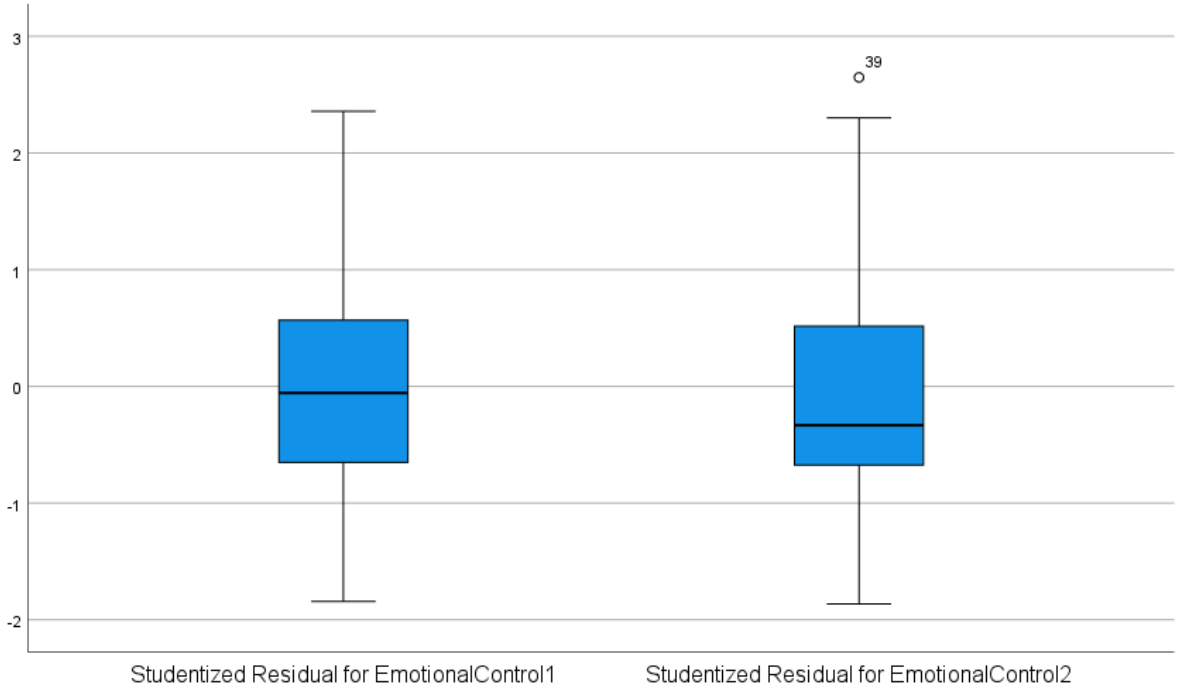
a. Design: Intercept + Cohort
Within Subjects Design: time

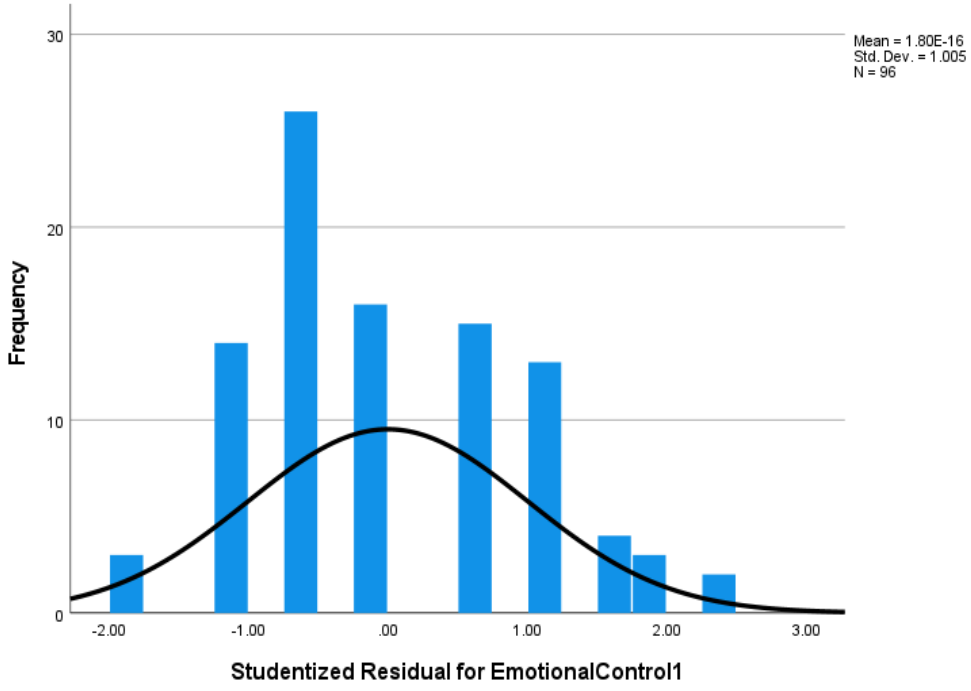
For the residual analysis, the test for normality on the residuals fails. However, the histograms show that the data is not seriously skewed, so the results are expected to hold due to the large sample sizes.

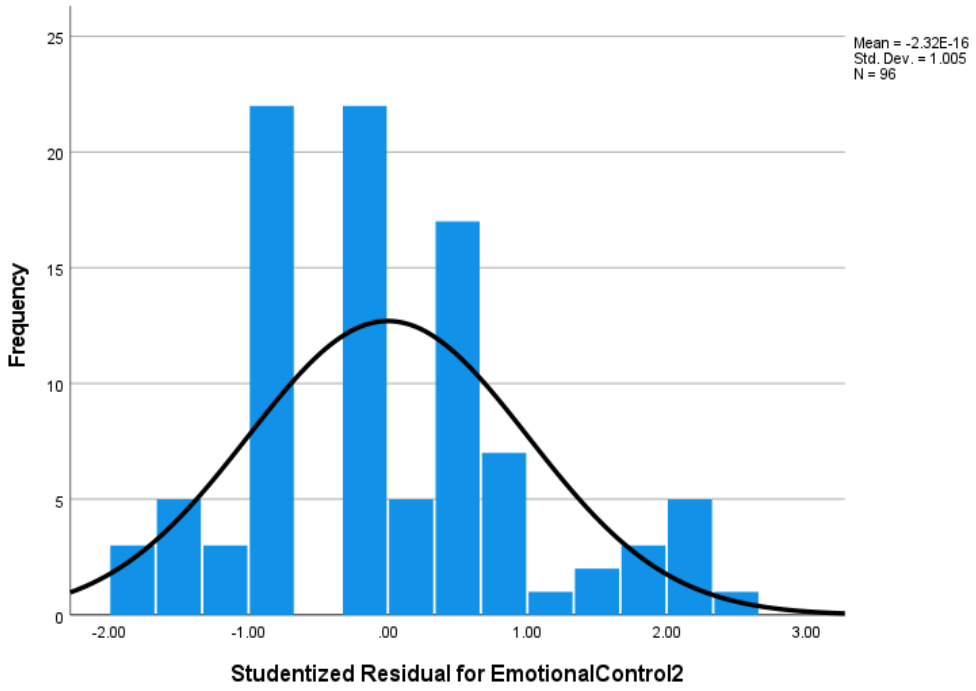
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Studentized Residual for EmotionalControl1	.181	96	<.001	.947	96	<.001
Studentized Residual for EmotionalControl2	.151	96	<.001	.956	96	.003

a. Lilliefors Significance Correction


3
2
1
0
-1
-2
39
Studentized Residual for EmotionalControl1
Studentized Residual for EmotionalControl2


30
20
10
0
Frequency
Mean = 1.80E-16
Std. Dev. = 1.005
N = 96
-2.00
-1.00
.00
1.00
2.00
3.00
Studentized Residual for EmotionalControl1



This accepts the alternate hypothesis. There is a significant difference in control (emotion) score over time as a function of group assignment.

Two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQ5: Is change in challenge score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Figure 6

Descriptive Statistics for RQ5

Descriptive Statistics

	Cohort	Mean	Std. Deviation	N
Challenge - 1	Traditional	4.30	1.807	43
	Transformational	4.77	1.898	53
	Total	4.56	1.863	96
Challenge - 2	Traditional	4.30	1.793	43
	Transformational	4.66	2.112	53
	Total	4.50	1.974	96

Tests of Within-Subjects Effects

Measure: CH

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	.152	1	.152	.134	.715	.001
	Greenhouse-Geisser	.152	1.000	.152	.134	.715	.001
	Huynh-Feldt	.152	1.000	.152	.134	.715	.001
	Lower-bound	.152	1.000	.152	.134	.715	.001
time * Cohort	Sphericity Assumed	.152	1	.152	.134	.715	.001
	Greenhouse-Geisser	.152	1.000	.152	.134	.715	.001
	Huynh-Feldt	.152	1.000	.152	.134	.715	.001
	Lower-bound	.152	1.000	.152	.134	.715	.001
Error(time)	Sphericity Assumed	106.660	94	1.135			
	Greenhouse-Geisser	106.660	94.000	1.135			
	Huynh-Feldt	106.660	94.000	1.135			
	Lower-bound	106.660	94.000	1.135			

There is no significant effect of the interaction term. The pairwise show no difference in the means for cohort or time levels.

Pairwise Comparisons

Measure: CH

(I) Cohort	(J) Cohort	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Traditional	Transformational	-.415	.362	.255	-1.133	.304
Transformational	Traditional	.415	.362	.255	-.304	1.133

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Pairwise Comparisons

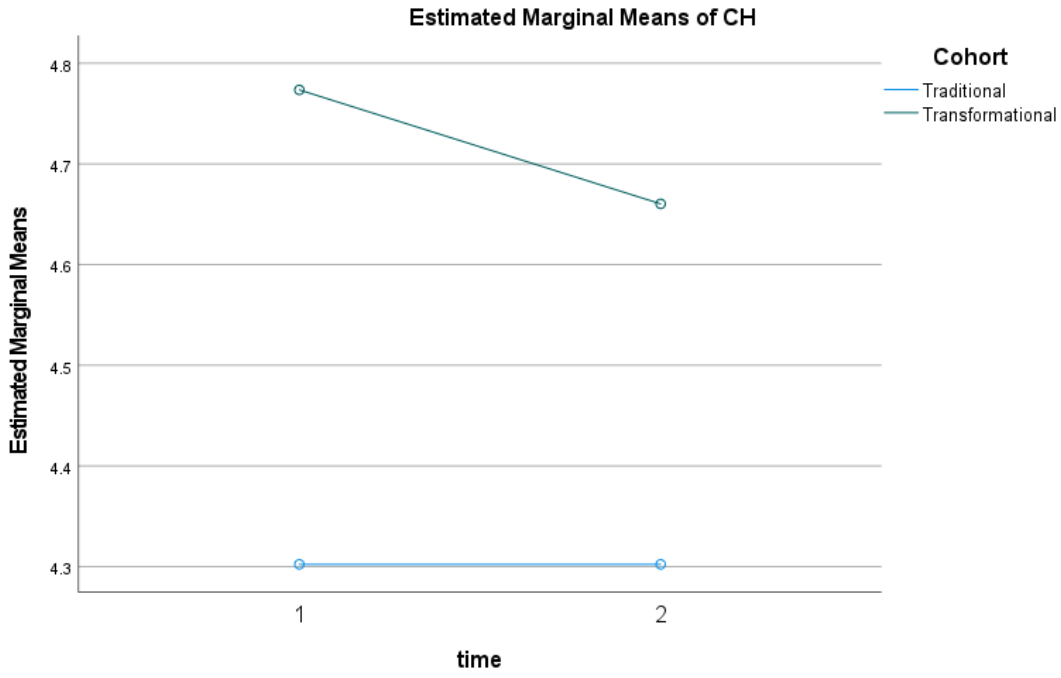
Measure: CH

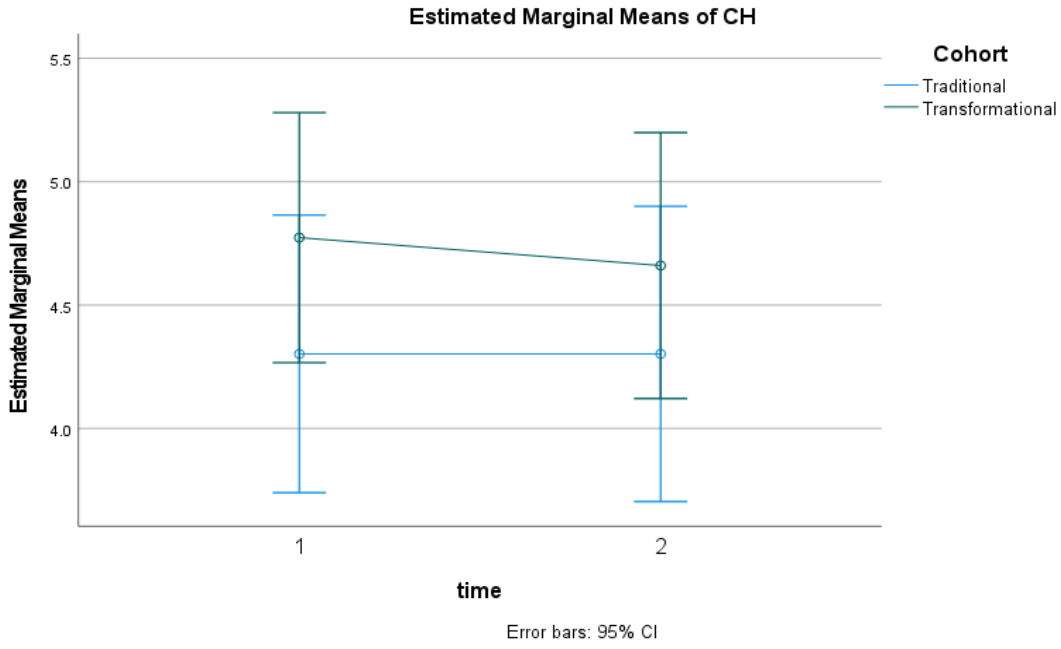
(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	.057	.155	.715	-.250	.364
2	1	-.057	.155	.715	-.364	.250

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

The graphs show that the mean for the traditional group was almost identical.





This fails to reject the null hypothesis. There is no significant difference in challenge score over time as a function of group assignment.

Two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQ6: Is change in confidence (abilities) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Figure 7

Descriptive Statistics for RQ6

Descriptive Statistics

	Cohort	Mean	Std. Deviation	N
Confidence in abilities - 1	Traditional	4.67	2.190	43
	Transformational	4.92	2.065	53
	Total	4.81	2.114	96
Confidence in abilities - 2	Traditional	4.70	2.042	43
	Transformational	5.19	1.991	53
	Total	4.97	2.018	96

Tests of Within-Subjects Effects

Measure: CIA

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	.980	1	.980	1.052	.308	.011
	Greenhouse-Geisser	.980	1.000	.980	1.052	.308	.011
	Huynh-Feldt	.980	1.000	.980	1.052	.308	.011
	Lower-bound	.980	1.000	.980	1.052	.308	.011
time * Cohort	Sphericity Assumed	.689	1	.689	.739	.392	.008
	Greenhouse-Geisser	.689	1.000	.689	.739	.392	.008
	Huynh-Feldt	.689	1.000	.689	.739	.392	.008
	Lower-bound	.689	1.000	.689	.739	.392	.008
Error(time)	Sphericity Assumed	87.639	94	.932			
	Greenhouse-Geisser	87.639	94.000	.932			
	Huynh-Feldt	87.639	94.000	.932			
	Lower-bound	87.639	94.000	.932			

There is no significant interaction term. Nor any significant differences in the means of the pairwise comparisons.

Pairwise Comparisons

Measure: CIA

(I) Cohort	(J) Cohort	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Traditional	Transformational	-.371	.401	.357	-1.166	.425
Transformational	Traditional	.371	.401	.357	-.425	1.166

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

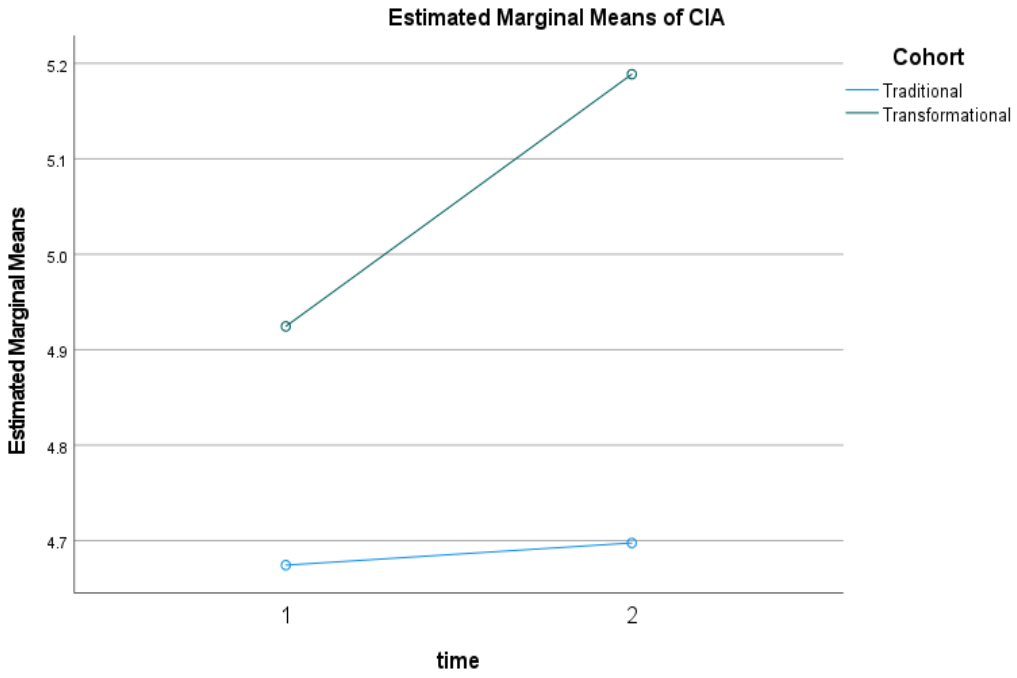
Pairwise Comparisons

Measure: CIA

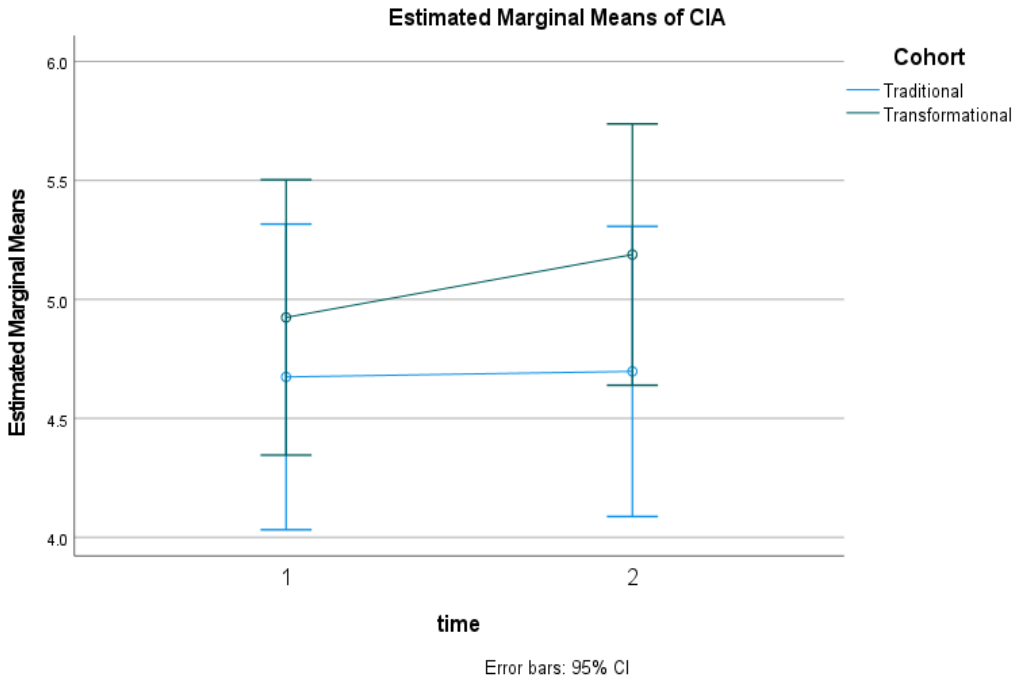
(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	-.144	.140	.308	-.422	.135
2	1	.144	.140	.308	-.135	.422

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.



The graphs show that there could be an effect of transformational coaching ahead of traditional methods as the graph appears to be diverging, but this cannot be concluded from the data.



This fails to reject the null hypothesis. There is no significant difference in confidence (abilities) score over time as a function of group assignment.

Two-way repeat measures ANOVA (mixed model ANOVA) to assess change over time as a function of the group for RQ7: Is change in confidence (interpersonal) score over time influenced by group assignment (transformational leadership coaching versus traditional coaching).

Figure 8

Descriptive Statistics for RQ7

Descriptive Statistics

	Cohort	Mean	Std. Deviation	N
Interpersonal confidence - 1	Traditional	4.98	1.908	43
	Transformational	4.38	1.655	53
	Total	4.65	1.789	96
Interpersonal confidence - 2	Traditional	5.00	1.558	43
	Transformational	4.74	1.841	53
	Total	4.85	1.717	96

Tests of Within-Subjects Effects

Measure: IPQ

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	Sphericity Assumed	1.730	1	1.730	1.756	.188	.018
	Greenhouse-Geisser	1.730	1.000	1.730	1.756	.188	.018
	Huynh-Feldt	1.730	1.000	1.730	1.756	.188	.018
	Lower-bound	1.730	1.000	1.730	1.756	.188	.018
time * Cohort	Sphericity Assumed	1.334	1	1.334	1.354	.247	.014
	Greenhouse-Geisser	1.334	1.000	1.334	1.354	.247	.014
	Huynh-Feldt	1.334	1.000	1.334	1.354	.247	.014
	Lower-bound	1.334	1.000	1.334	1.354	.247	.014
Error(time)	Sphericity Assumed	92.583	94	.985			
	Greenhouse-Geisser	92.583	94.000	.985			
	Huynh-Feldt	92.583	94.000	.985			
	Lower-bound	92.583	94.000	.985			

There is no significant interaction term. The pairwise comparisons show no differences in cohort or time.

Pairwise Comparisons

Measure: IPQ

(I) Cohort	(J) Cohort	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Traditional	Transformational	.432	.328	.192	-.220	1.084
Transformational	Traditional	-.432	.328	.192	-1.084	.220

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Pairwise Comparisons

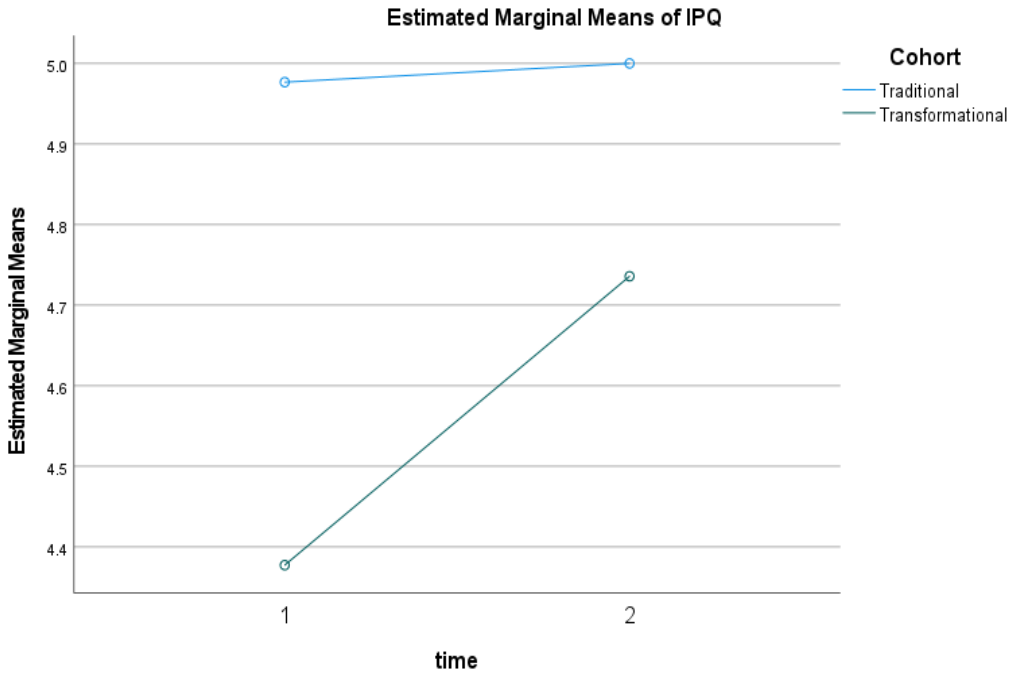
Measure: IPQ

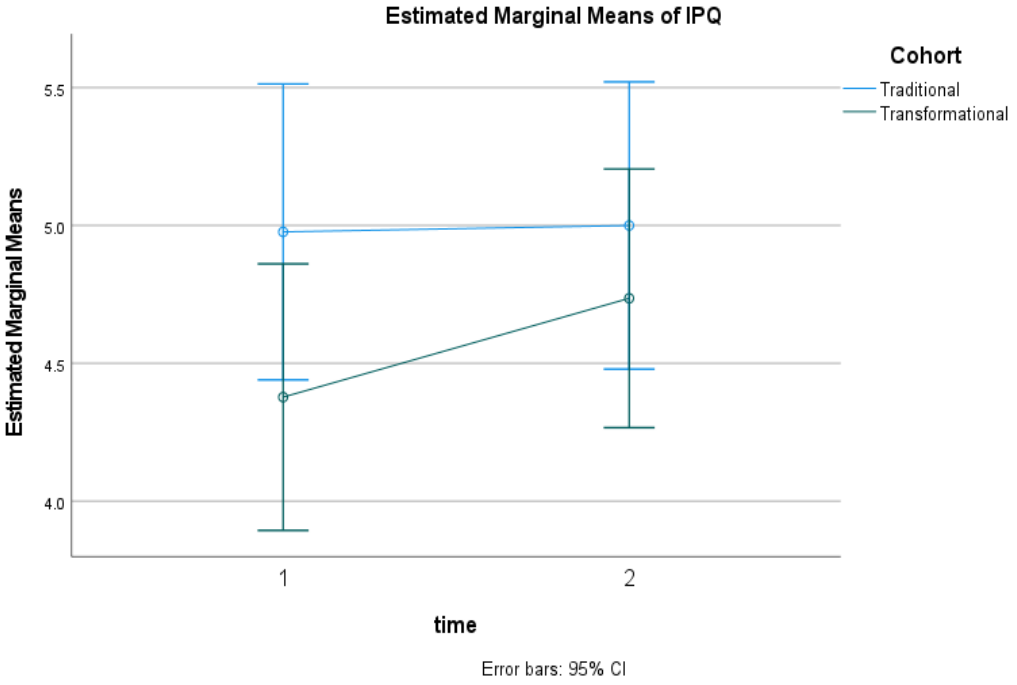
(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	-.191	.144	.188	-.477	.095
2	1	.191	.144	.188	-.095	.477

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

The graphs show that there could be an effect of transformational leadership coaching ahead of traditional methods, as the graph appears to be diverging, but this cannot be concluded from the data.





This fails to reject the null hypothesis. There is no significant difference in confidence (interpersonal) score over time as a function of group assignment.

Summary of results for mixed methods ANOVA for research questions 1 to 7.

There were significant improvements in both Mental Toughness (MT) and Emotional control (EC) for the transformational cohort over the traditional cohort over time, using the analysis from the two-way ANOVA. There were no significant differences but indications of improvement for the variables: life control (LC), commitment (COM), confidence in abilities (CIA), and interpersonal confidence (IPC). It may be the case that a longer period of time between measurements would have shown a significant difference between the groups. There appeared to be no differences in the cohorts for Challenge (CH).

Multiple Linear Regression Analysis

I conducted a multiple linear regression analysis using research question 8: Do group assignment, baseline total score, competitive playing level, and age serve as predictors of the final total score. I used the standard entry method, which enables the entry of the predictor variables into the linear regression analysis simultaneously. The predictor variables are baseline total score, cohort group (Transformational or Traditional), age, and playing standard. The dependent variable is the final total score. The predictor variables and dependent variables were recoded. The cohort was altered to cohortcoded, with Traditional coaching placed into group 1 and transformational, 2. Standard was changed to standardcoded with the A team's being group 1, B group 2, C group 3, D group 4, and E group 5. Age was changed into agecoded with the U14 age

participants placed into group 1, the U15's into group 2, the U16's into group 3, and the U18s into group 4. Below are the results from the analysis of the basic model.

Multiple Linear regression analysis for Research Question 8 (RQ8): Do group assignment, baseline total score, competitive playing level, and age serve as predictors of the final total score.

Figure 9

Descriptive Statistics for RQ8

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	BLtotalscore, cohortcoded, agecoded, standardcoded[b]	.	Enter

a. Dependent Variable: Finaltotalscore

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.903[a]	.816	.808	4.50199

a. Predictors: (Constant), BLtotalscore, cohortcoded, agecoded, standardcoded

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8184.863	4	2046.216	100.959	.000[b]
	Residual	1844.377	91	20.268		
	Total	10029.240	95			

a. Dependent Variable: Finaltotalscore

b. Predictors: (Constant), BLtotalscore, cohortcoded, agecoded, standardcoded

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.208	3.062		.394	.694
	cohortcoded	1.685	1.059	.082	1.591	.115
	standardcoded	-.586	.397	-.077	-1.474	.144

agecoded	.263	.448	.027	.588	.558
BLtotalscore	.913	.048	.872	18.997	.000

a. Dependent Variable: Finaltotalscore

The model shows the results to be significant in predicting the total final score. The baseline score is the only significant term that is highly correlated with the final score. R=0.903 for the model. Stepwise regression was then conducted. This offers two significant models, one with just baseline alone and one with the standard of the individual. Introducing the standard into the model explains and offers only slightly more variation – which can be seen in the following adjusted R square.

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.892[a]	.796	.794	4.66111	
2	.900[b]	.811	.807	4.51897	2.403

a. Predictors: (Constant), BLtotalscore

b. Predictors: (Constant), BLtotalscore, standardcoded

c. Dependent Variable: Finaltotalscore

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7986.999	1	7986.999	367.625	<.001[b]

	Residual	2042.240	94	21.726		
	Total	10029.240	95			
2	Regression	8130.081	2	4065.040	199.061	<.001[c]
	Residual	1899.159	93	20.421		
	Total	10029.240	95			

a. Dependent Variable: Finaltotalscore

b. Predictors: (Constant), BLtotalscore

c. Predictors: (Constant), BLtotalscore, standardcoded

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.447	1.706		1.434	.155	-.941	5.835
	BLtotalscore	.934	.049	.892	19.174	<.001	.837	1.030
2	(Constant)	5.076	1.930		2.631	.010	1.244	8.908
	BLtotalscore	.917	.048	.876	19.249	<.001	.822	1.012
	standardcoded	-.914	.345	-.121	-2.647	.010	-1.599	-.228

a. Dependent Variable: Finaltotalscore

The standardcoded predictor variable in the assessment model shows that dropping down a team (from an A team to a B team) will reduce the final total score by 0.9 (about one score). This suggests that although the best predictor of the final score is the baseline score, being in a better team results in better final outcomes (measured by the total score). However, this does not have a huge impact on the final total, i.e., the average per

individual for the final score is 33.8, so each team standard dropped will only account for 0.91/33.9 = 2.7% on average.

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	Cohortcoded	.118[b]	2.601	.011	.260	.996
	Standardcoded	-.121[b]	-2.647	.010	-.265	.982
	Agecoded	.036[b]	.768	.445	.079	.969
2	Cohortcoded	.079[c]	1.541	.127	.159	.771
	Agecoded	.019[c]	.410	.683	.043	.949

a. Dependent Variable: Finaltotalscore

b. Predictors in the Model: (Constant), BLtotalscore

c. Predictors in the Model: (Constant), BLtotalscore, standardcoded

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Finaltotalscore	96	13.00	65.00	33.8646	10.27477	.421	.246
Valid N (listwise)	96						

Assumptions

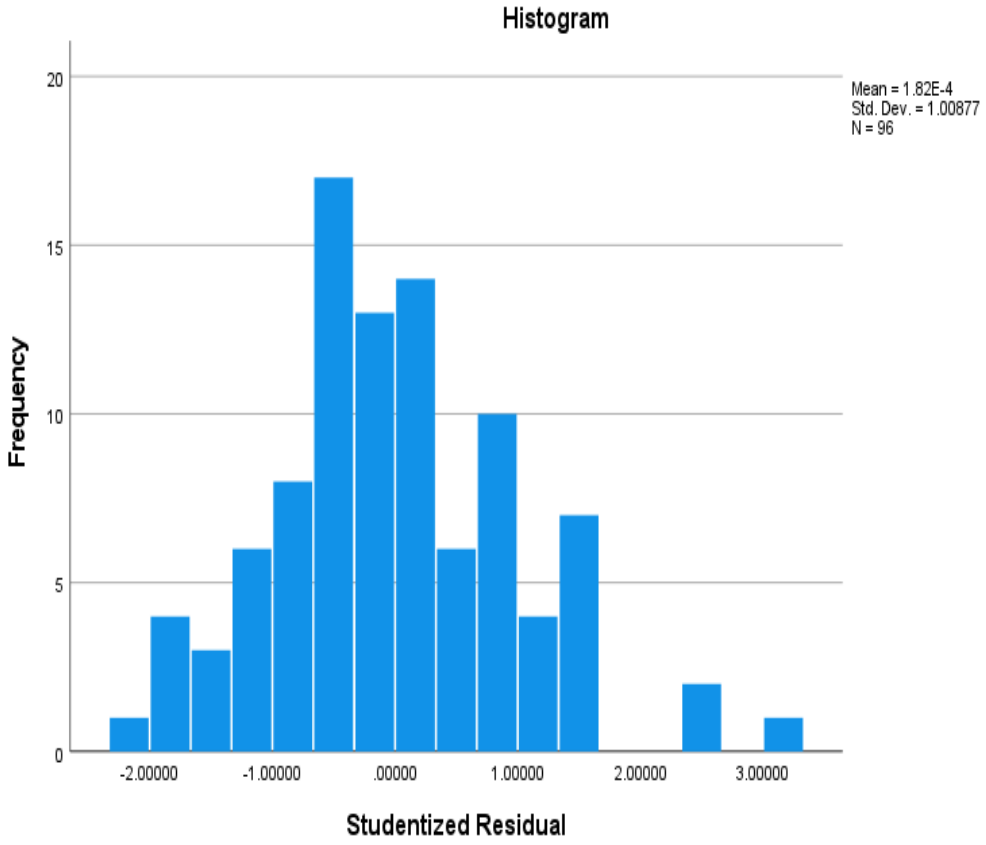
Although there are a few abnormalities, the residuals are normal enough for the test to be valid. This can be viewed in the following histogram, which displays a relatively normal distribution curve.

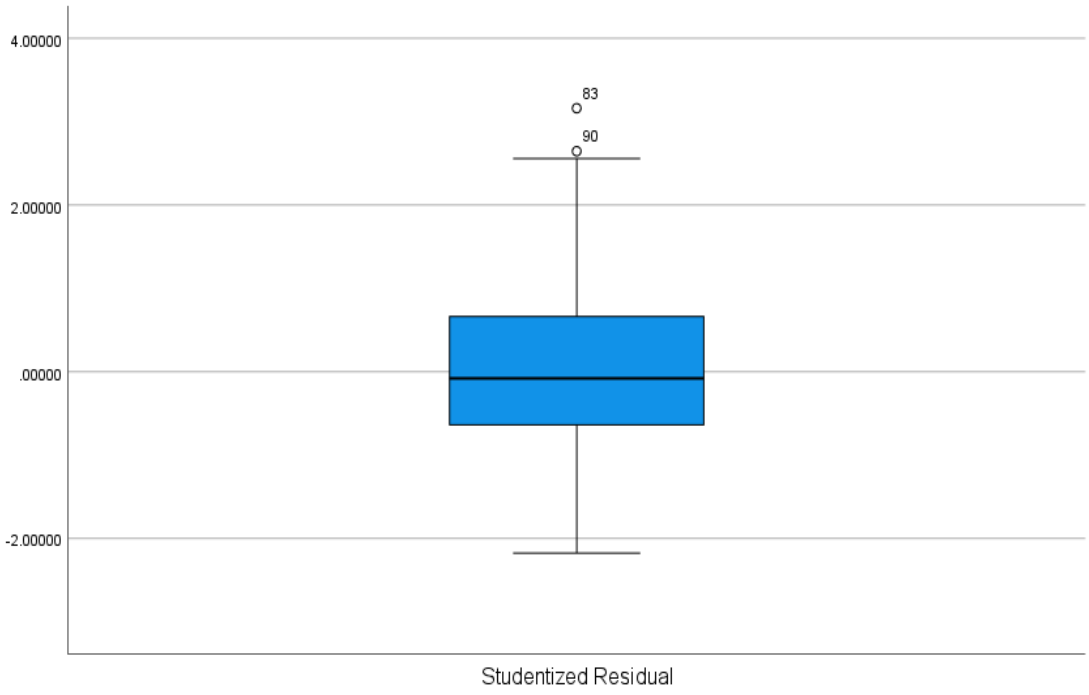
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Studentized Residual	.068	96	.200*	.981	96	.179

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction


Histogram
Mean = 1.82E-4
Std. Dev. = 1.00877
N = 96
Frequency
20
15
10
5
0
-2.00000
-1.00000
.00000
1.00000
2.00000
3.00000
Studentized Residual



Summary of Findings

Summary of Results for the Multiple Linear Regression Analysis

Using the standard entry method for the multiple linear regression analysis, the predictor variables were analyzed in order to identify if they had a significant impact on the final total score. From the predictor variables of baseline total score, cohort group (Transformational or Traditional), age, and playing standard, the baseline score is the only significant term that is highly correlated with the final score. R=0.903 for the model. Using a step wise regression analysis showed that dropping down a team in playing standard, from an A team to a B team, will reduce the final total score by 0.9. This suggests that although the best predictor of the final score is the baseline score, being in a better team results in better final outcomes (measured by the total score).

Summary of Results for Mixed Methods ANOVA for Research Questions 1 to 7

There were significant improvements in both Mental Toughness (MT) and Emotional control (EC) for the transformational cohort over the traditional cohort over time, using the analysis from the two-way ANOVA. RQ1, which assessed if the MT score over time was influenced by group assignment, showed a difference of 0.585 between the two cohort groups of transformational leadership coaching and the traditional coaching groups over time. Transformational leadership coaching displayed clear improvements in overall mental toughness, whereas traditional coaching methods showed a decline. RQ5, which assessed if Emotional Control (EC) score over time was influenced by the group, showed a difference of 0.526. The data and graphical depiction show that the drop in EC for the traditional coaching cohort is responsible for the difference. It appears that there is a significant drop in this cohort group, whilst the transformational group has made a slight but not significant increase.

There were no significant differences but indications of improvement for the variables: life control (LC), commitment (COM), confidence in abilities (CIA), and interpersonal confidence (IPC). It may be the case that a longer period of time between measurements would have shown a significant difference between the groups, as although differences were not statistically significant at the time of results collection, observations showed that the margin between the two groups might continue to grow if greater time was offered for further study of these variables. There appeared to be no differences in the cohorts for Challenge (CH). Further discussion and possible reasoning for these results will be discussed in chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative quasi-experimental analysis was to identify the differences in mental toughness scores and individual mental toughness factor scores attained by the sport's participants, which related to the group assignment of the style of sports coaching they received. The coaching styles were either Transformational Leadership coaching or traditional coaching methods. Although extensive research has been conducted on higher levels of mental toughness as a predictor of higher sports performance (Clough et al., 2015), and the positive effects of transformational leadership coaching on youth sports development and improved longevity of participation (Cote & Turnnidge, 2015), no research has been conducted on the impact of transformational leadership coaching methods on mental toughness development. Specifically, within this study, the focus was on youth participants to discover if this form of sports coaching could have a positive effect on mental toughness and thus hopefully reduce mental health issues in adulthood and improved mental well-being.

In this study, I assessed mental toughness using the MTQ-48 assessment tool, pre and post a coaching intervention. The coaching methods were either traditional or transformational in approach, with the intervention lasting for six weeks in total. Statistical analysis was conducted using a mixed-methods ANOVA for the RQs one through seven. These analyzed a change over time of mental toughness or its relating factors to decipher if these were influenced by the group assignment of either transformational leadership coaching or traditional coaching. The first research question

focused on mental toughness as a whole score. The further six research questions then focused on the change over time of the individual factors which make up the mental toughness construct: Emotional control (EC), life control (LC), commitment (COM), confidence in abilities (CIA), interpersonal confidence (IPC), and challenge (CH). Results for these research questions showed a significant difference in cohort groups within overall mental toughness (MT) and EC. There were no significant differences, but indications of improvement for the variables: LC, COM, CIA, and IPC, and there was no difference in CH scores. I used a multiple regression analysis to determine the relationship between the predictor variables and the final total mental toughness score. The predictor variables were baseline total score, cohort group (Transformational or Traditional), age, and playing standard. This analysis showed that the baseline score was the only significant term highly correlated with the final total score.

Interpretation of the Findings

Hypothesis 1: Mental Toughness

In Hypothesis 1, I examined if there was a significant difference between the cohort groups' mental toughness over time due to the cohort group assignment of either transformational leadership coaching or traditional coaching methods. There was a significant difference of 0.585 between the two cohort groups at the end of the intervention study. Traditional coaching methods showed a decline in overall mental toughness over the intervention, and transformational leadership coaching displayed a steady increase. These results support previous literature on mental toughness development conducted by Subhan et al., (2019), specifically within cricket, where

transformational leadership coaching improved mental toughness in elite-level cricketers. This significant improvement in mental toughness scores post a transformational leadership coaching intervention aligns with the research by Subhan et al., (2019), which focused on the change in mental toughness scores due to transformational leadership coaching in elite level cricket.

Hypothesis 2: Commitment

In Hypothesis 2, I examined if there was a significant difference between the cohort groups' COM over time due to the cohort group assignment of either transformational leadership coaching or traditional coaching methods. Results showed that there was no significant interaction term between time and cohort. However, there was a significant difference between the traditional and transformational cohorts. The transformational group had a significantly higher mean irrespective of the time period than the traditional for their commitment, resulting from the level of the teams assigned to the transformational group. They tended to be teams of a higher standard. The differences between the two cohort groups seemed to be increasing from the graphical representation, but the statistical difference was not great enough to be significant. The duration of the intervention was six weeks in length, and it would be a fair assumption to conclude that if the length of the intervention were extended and the cohort group's path projection continued in the same vein, the levels of commitment would become significant. This outcome aligns with previous research conducted by Clough et al., (2015), which compared mental toughness individual factor scores of police recruits and

first-year university students. Within this study, commitment was a mental toughness factor that was more significant in the police recruits.

Hypothesis 3: Control (Life)

In Hypothesis 3, I examined if there was a significant difference between the cohort groups' LC over time due to the cohort group assignment of either transformational leadership coaching or traditional coaching methods. The statistical analysis shows no significant interaction term, and the pairwise comparisons show no difference in before and after scores for the cohorts or the times. However, the differences between cohort groups due to the graphical depiction showed some increased change between them and, as in the case with commitment above, it would be a fair assumption if a more extended period of time was given to the coaching intervention, to state that there would become a significant difference between the two cohort groups. Although significant differences were not found, the change seen is in line with research conducted by Crust and Clough (2011). They stated that mental toughness is a stable constant that can be malleable or altered through intervention or specific experience during the developmental years.

Hypothesis 4: Control (Emotional)

In Hypothesis 4, I examined if there was a significant difference between the cohort groups' EC over time due to the cohort group assignment of either transformational leadership coaching or traditional coaching methods. From the statistical analysis, there was a significant difference between the two cohort groups. The graphical depiction shows that the drop in EC for the traditional cohort is responsible for the

difference. It appears that there is a significant drop in this cohort group. In contrast, the transformational group has made a slight but insignificant increase with an overall difference of 0.526 at the end of the intervention period. Previous research supports the discussion that transformational leadership coaching improves emotional control and stability. Mental toughness is thought to be one of the main contributing psychological factors to enable consistency in performance. It allows sports participants to be emotionally stable, create strong, authentic relationships with their coaches and peers, be rational, remain creative, stay focused, and, finally, perform to their highest level during training and pressured competition (Moran, 2012).

Further research has consistently shown that across all the tested sports, the common traits that come under the umbrella of mental toughness are high self-confidence, resilience, unbreakable belief in oneself, personal motivation, and upholding personal values (Vaughan et al., 2018). Although the graphical depiction shows that the significance was apparent due to traditional coaching methods causing a decline in emotional control, there is also an increase of EC from the transformational leadership group. Given a longer intervention period and the focus solely on transformational leadership creating higher levels of EC, it would be fair to state that transformational leadership coaching improves EC in adolescent sports performers. The interesting finding from this analysis is the destructive nature of traditional coaching on the EC of adolescents. Players need to be given decisions to make and be empowered within their sporting environment to develop EC and grow as a performer and person. This significant finding is in line with previous research conducted by Subhan et al., (2019) on mental

toughness and, more specifically, emotional stability, developed through a coaching intervention in elite-level cricket.

Hypothesis 5: Challenge

In Hypothesis 5, I examined if there was a significant difference between the cohort groups CH over time due to the cohort group assignment of either transformational leadership coaching or traditional coaching methods. There was no difference in the pairwise comparisons of the cohort groups. The graphical depiction displayed a slight, non-significant decrease in challenge values from the transformational leadership group. These results align with previous research conducted by Clough et al., (2015), which focused on comparing mental toughness individual factor scores of police recruits and first-year university students. Within this study, CH was a mental toughness factor that was shown to not be significantly greater in either group.

Hypothesis 6: Confidence (Abilities)

In Hypothesis 6, I examined if there was a significant difference between the cohort groups' CIA over time due to the cohort group assignment of either transformational leadership coaching or traditional coaching methods. There is no significant interaction term. Nor any significant differences in the means of the pairwise comparisons. The graphs show that there could be an effect of transformational coaching ahead of traditional methods as the graph appears to be diverging, but this cannot be concluded from the data. If a longer intervention period was conducted and values continued to rise in the same linear manner, then the factor of confidence in abilities could show significant results in time. Although significant differences were not reported

here, the change seen is in line with research conducted by Crust and Clough (2011), where they state that mental toughness is a stable constant that can be malleable or altered during the developmental years through intervention or specific experience.

Hypothesis 7: Confidence (Interpersonal)

In Hypothesis 7, I examined if there was a significant difference between the cohort groups' IPC over time due to the cohort group assignment of either transformational leadership coaching or traditional coaching methods. There is no significant interaction term nor any significant differences in the means of the pairwise comparisons. The graphs show that there could be an effect of transformational coaching ahead of traditional methods as the graph appears to be diverging, but this cannot be concluded from the data. If a longer intervention period was offered and values continued to rise in the same linear manner, then the factor of interpersonal confidence could show significant results in time. Interestingly, the performers from the transformational leadership groups were predominantly from higher-performing teams, yet from data, their average scores for interpersonal confidence were lower than those in the traditional coaching cohorts who played predominantly in lower standard teams. Although significant differences were not reported here, the change seen is in line with research conducted by Crust and Clough (2011), where they state that mental toughness is a stable constant that can be malleable or altered during the developmental years through intervention or specific experience.

Hypothesis 8: Group Assignment, Baseline Total Score, Competitive Playing Level, and Age as Predictors of the Final Total Score.

In Hypothesis 8, I used a multiple linear regression analysis to analyze if the predictor variables significantly impacted the final total score. From the predictor variables of baseline total score, cohort group (Transformational or Traditional), age, and playing standard, the baseline score is the only significant term that is highly correlated with the final score. R=0.903 for the model. Stepwise regression analysis showed that dropping down a team in playing standard, from an A team to a B team, will reduce the final total score by 0.9. This suggests that although the best predictor of the final score is the baseline score, being in a better team results in better final outcomes (measured by the total score).

Limitations of the Study

From the interpretation of the results, an extended intervention period may have offered greater, more conclusive results overall. There were no significant differences but indications of improvement for the variables: LC, COM, CIA, and IPC. The graphical depictions showed that these variables were increasing over time in the transformational leadership cohorts, suggesting that results/differences could become significant in a longer intervention period.

At the time of design, the study was focused on assessing transformational leadership coaching within a variety of sports during the autumn term within the U.K. school. These sports would have been rugby, football, and badminton. The design needed to change, which was forced by a delay in school sports participation due to the global

COVID-19 pandemic. At the time of COVID-19 restrictions being lifted, cricket was the sport that was being played competitively by U.K. schools, and the transformational leadership coaches were all part of this single sport coaching group. The previously named sports of rugby, football, and badminton are shorter in duration than cricket and offer opportunities within training and matches for many more coach contacts, which may lend themselves to being even better impacted by transformational leadership coaching methods. The results from this study, which focused on cricket, are exciting and pleasing to see, with mental toughness and emotional control showing significant improvements over a short period of time in a sport with fewer coach contacts. Further studies should be conducted on other individual sports over a longer period of time to see if mental toughness improves from baseline more in these sports than cricket.

Cohort number was enough to ensure statistical analysis, but larger cohort groups would offer greater evidence of the effects of each group assignment. The total cohort was restricted due to the intervention taking place in a single school and due to the number of coaches available that had undertaken transformational leadership coaching training.

Recommendations

This study design would benefit from further research being conducted in the same way across a wide range of sports, nationwide and at differing performance levels, to see if the variance in coach contacts and performance expectations alters the mental toughness development outcome. This study design would be helpful for National Governing Bodies (NGB's) to replicate, to further evidence the need to use

transformational leadership coaching as a framework for their coaching model to support the mental well-being of younger participants and also to use a method of coaching which will increase the longevity of participation and improved performance rates within their sport.

A longer period needs to be given to a future intervention of a similar design to gain maximum information from the results. Given the findings of this study, the participants' mental well-being should be examined as a future study concerning transformational leadership coaching. It would be a fair assumption to conclude that if mental toughness improved due to transformational leadership coaching methods, mental well-being may also improve if participants are offered the same positive coaching environment. If this intervention study were to be conducted, an appropriate mental well-being assessment tool would be needed to be used to conclude this statistically.

The age range of participants on which the study was conducted was between 14 to 18 years old. Although this is not a restricting factor, further research would be useful if conducted within a wider range of age ranges from prep school teaching to elite level sports for both men and women. Results between the age ranges, gender, and standard levels could then be compared to decipher what the best age group would be to implement this form of coaching to get the best outcome for the players.

Implications

There is an obvious outcome of this study for positive social change. The use of transformational leadership coaching has been shown in this short intervention to improve adolescent sports participants' mental toughness significantly. If this form of

coaching were to become more widely used in various sports, the mental toughness of more individuals would improve, thus reducing the prevalence of mental ill-health in early to late adulthood within sports participants. Although this study is focused on the delivery of transformational leadership through sports coaching methods, the principles can be applied to many areas of development that have interaction between a coach and participant, teacher and pupil, parent, and child, in a variety of settings.

A further benefit is that the mental toughness that the participant has developed through their sports coaching is not solely restricted to being utilized within their sports performance, but it is a state of mind that is also then applied to other facets of the participants' life, giving them more mental toughness in social environments, extracurricular activities and within education.

The results from this study would also suggest that the emotional control of an individual is improved from utilizing this form of coaching. The knock-on effect of this is an ability to maintain emotional control during times of stress, thus reducing feelings of stress and anxiety for the individual and allowing them to cope better with competitive or stressful situations.

Finally, the coaching method is one that offers structure and purpose to every interaction that the coach has with the participant. It focuses on developing a positive relationship with the individuals and then finding individualized ways of empowering them and stretching each aspect of their mental toughness. This creates a pleasant and structured coaching plan which offers high levels of coach and participant satisfaction in the interaction and coaching process.

Conclusion

There are many styles of coaching and management which have been tried and tested over the years. Often the primary concern is the performance outcome of the team despite the mental well-being of the individual athletes. Transformational leadership coaching has been a recently utilized style of coaching focused on developing the whole individual, improving mental well-being, and gaining greater performance outcomes. This study has shown that in a short period of time, Transformational leadership coaching can have a significantly positive effect on the mental toughness of adolescent sports participants and specifically enables them to have greater emotional control. Further studies of longer intervention length should be conducted in a variety of sports, which will hopefully provide more significant evidence that Transformational leadership coaching is a method that should be utilized within all sports, creating a positive, focused environment that offers tools for life and is beneficial to all involved.

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Appendix A: Program/initiative oversite and data use agreement from the Principal/Headmaster.

PROGRAM/INITIATIVE OVERSIGHT AND DATA USE AGREEMENT

Our employee/practicum student, Richard Finch, is involved in the Transformational leadership coaching initiative which will be conducted under our organization's supervision within the scope of our standard operations. We understand that Richard Finch seeks to write about this initiative as part of a doctoral project for Walden University. To this end, we agree to share a de-identified dataset with the student for doctoral project purposes, as described below.

I understand that the student will not be naming our organization in the doctoral project report that is published in Proquest.

The Walden University Institutional Review Board (IRB) will be responsible for ensuring that the student's published doctoral project meets the university's ethical standards regarding data confidentiality (outlined below). All other aspects of the implementation and evaluation of the initiative are the responsibility of the student, within his role as our employee.

The doctoral student will be given access to a Limited Data Set ("LDS") for use in the doctoral project according via the ethical standards outlined below.

This Data Use Agreement ("Agreement"), effective as of the 10th of May 2021("Effective Date"), is entered into by and between Richard Finch ("Data Recipient") and Harrow school ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in the doctoral project **in accord with laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient's educational program.** In the case of a discrepancy among laws, the agreement shall follow whichever law is more strict.

1. *Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.*

2. *Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations*

3. *Data Fields in the LDS. No direct identifiers such as names may be included in the Limited Data Set (LDS). In preparing the LDS, Data Provider or shall include the data fields specified as follows, which are the minimum necessary to accomplish the doctoral project:* Age, playing level and mental toughness scores pre and post coaching period.

4. *Responsibilities of Data Recipient.*

Data Recipient agrees to:

a. *Use or disclose the LDS only as permitted by this Agreement or as required by law;*

b. *Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;*

c. *Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;*

d. *Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and*

e. *Not use the information in the LDS to identify or contact the individuals who are data subjects.*

5. *Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for the present project activities only.*

6. *Term and Termination.*

a. *Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.*

b. *Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.*

c. *Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.*

d. *For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.*

e. *Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.*

7. *Miscellaneous.*

   a. *Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.*

   b. *Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.*

   c. *No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.*

   d. *Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.*

   e. *Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.*

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

Partner Organization	**Doctoral Student**
Signed: Alastair Lound	Signed:
Print Name: ALASTAIR LOUND	Print Name: RICHARD FINCH
Print Title: HEAD MASTER	Print Title: Director of Sport.
Date: 10/V/21	Date: 11/5/21

Appendix B: Permission to use the MTQ48 for this research study

Hi Richard,

Thanks for sending that across - Professor Clough approves your proposal.

Regarding the time it takes to develop MT, it is very variable - it depends on the starting point, the sample, etc. It is possible to change in a few weeks but can take years.

I have attached a reference list of MTQ studies which may prove useful to you.

Many thanks,

Sonia

Appendix C: Transformational leadership coaching guidance form for experimental group.

Dear Transformational leadership coach. Here is a guidance sheet on how you should conduct yourself within a transformational leadership coaching environment in order to get the best from your players.

Follow the behaviors within each section of the four ‘I’s’.

The descriptions of how you should complete this are below each behavior.

Try and do these consistently during each coaching session and during all interactions with the boys. Some will take time to develop. Some are similar.
Be authentic in your approach.

Idealized Influence

Behavior - Discussing and modeling prosocial values or behaviors

Description - Discussion or modelling of behaviors that are intended to benefit others and that are often prompted by empathy, morality, or a sense of social responsibility, rather than a desire for personal gain (e.g., showing respect).

Behavior - Showing vulnerability and humility

Description - Recognize gaps in their knowledge or understanding. May involve asking for help or apologizing for mistakes you/they make.

Behavior - Discussing goals and expectations

Description -Express expectations for a specific practice, a specific drill, or future events such as an upcoming game or goals for the season. Can also include discussion of goals, goal setting, etc.

Behavior - Expressing confidence in athlete(s)' capabilities

Description - Convey an optimistic or enthusiastic attitude regarding what the athlete can achieve.

Behavior - Implementing a collective vision

Description - Encourage team spirit and collaborative attitudes among team members.

Behavior - Providing meaningful and challenging tasks and roles

Description - Highlight the value or meaning of certain activities and role or provide rationales.

Intellectual Stimulation

Behavior - Eliciting athlete input

Description - Convey a view of the athlete(s) as contributing members of the situation and encourage athlete(s) to solve problems and contribute ideas.

Behavior - Sharing decision making and leadership responsibilities

Description - Provide opportunities for the athlete(s) to make decisions, show initiative, leadership (e.g., demonstrating skills, leading a warm-up).

Behavior - Emphasizing the learning process

Description - Encourage athlete(s) to value effort, learn from mistakes, or engage in challenging tasks

Individualized Consideration

Behavior - Showing interest in athletes' needs

Description - Recognize and/or adapt to an athlete's individual needs or consider their unique abilities.

Behavior - Recognizing individual roles and contributions

Description - Show an appreciation for athlete(s) efforts (e.g., recognizing proper execution of skills, thanking athlete(s) for their help).

Inspirational motivation

Behavior - Discussing goals/expectations

Description - Express expectations for a specific practice, a specific drill, or future events such as an upcoming game or goals for the season. Can also include discussion of goals, goal setting, etc.

Behavior - Expressing confidence in athlete(s) potential

Description - Convey an optimistic or enthusiastic attitude regarding what the athlete can achieve if they strive to attain it.

Behavior - Providing rationales/explanations

Description – Offer explanation/reasoning for types of practice or games play. Relate it to observations from the coach or player perceptions on previous competitive situations as an area to improve.

Appendix D - Collaborative IRB Training Initiative (CITI) certificate

Completion Date 22-Nov-2020
Expiration Date N/A
Record ID 39733547

This is to certify that:

Richard Finch

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Student's
(Curriculum Group)
Doctoral Student Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Walden University

Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w654442b2-3fa9-4566-aaa9-ac309ddcfced-39733547