

Positive Physical Education: Teaching Well-Being Skills Through Sport

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Abstract

The prevalence of mental health problems in young people is a serious issue globally. To expand the reach of well-being education within and beyond the school (and the classroom) environment, this capstone poses two big questions: *Can sport teach well-being? If so, which sports, and for what skills?* Focusing on the mind-body connection, this capstone leverages the inherent well-being benefits of physical activity and investigates the potential to incorporate explicit teaching of well-being skills through sport. Positive Physical Education (PPE) is introduced, and it aims to teach well-being skills to school-aged children through sport. PPE incorporates sports-based positive psychology interventions, that harness both physiological and psychological benefits, to form an ‘upward spiral’ towards improved well-being. This capstone will spotlight three sports and physical activities - hiking, boxing, and basketball – as vehicles to teach optimism, mindfulness, and empathy. We explore the qualities of sport that make it a great avenue to teach well-being skills, such as handling setbacks and adversities, the presence of coaches and teammates, body awareness, and stress regulation through our nervous systems, to name a few. The goal of this capstone is to inspire schools and sports educators to integrate well-being skills into their sports curriculum.

Keywords: youth, positive education, positive physical education, sports, physical activity, optimism, mindfulness, empathy, sports-based interventions, mind-body connection

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Preface

The story of “The Snowman” holds a special place in my heart. The story follows a little boy being woken up in the middle of the night, by a snowman he had built and had magically come alive. Taking the boy’s hand, they take flight and journey to Norway to meet Father Christmas, for the night of a lifetime. The next morning, the boy finds that the snowman had melted, and he mourns the loss of the snowman. The lyrics include: *“I’m finding I can fly. So high above with you.”*

* * *

On Friday, September 13th, 1995, I took the bus to school, just like any normal day. I was 11 years old and had just started secondary school. I was excited about new friends, and the new environment. When I returned home that day, my mom, grandma, grandpa, and a few other relatives, were gathered in the living room of our apartment. I immediately sensed something was not right. Grandpa sat me down and talked to me, but I cannot remember what he said. I just knew that my father was gone.

No one told me that he took his own life, I had to piece it together myself. When my friends asked about my family, I made up different versions of the story: *“He’s too occupied,”* or *“He’s working in Canada.”* My way to cope was to move on. Focus on the future, not the past.

My father was quiet, kind, and unassuming. However, he also treated his work and himself seriously. Before his passing, he was responsible for teaching me, and checking over my schoolwork. After he left, my mom dedicated time to look after my younger brother, who has Down syndrome, and I was granted a lot of freedom for exploration. As a teenager, I acted out. I recall the tears, pain, and guilt that my mom endured, as she collected me from the police station after I was caught stealing an All Saints CD.

Sport became my refuge and safe space. After-school sports programs kept me out of trouble and provided the opportunity to spend time with my friends, with whom I maintain a close bond with, even till this day. Although not explicitly taught, I learned many important life skills, such as teamwork, self-control, perseverance, and emotional regulation, to name several, from my athletic endeavors.

I was also lucky to have positive mentors, of whom I am grateful for. I met a Swiss businessman, a true pioneer in coaching, who taught me that ‘other people matter’. Later, a leader in global sports and entertainment gave me the opportunity to work in the industry, who also celebrated with me on my wedding day. I longed for fatherly figures - role models to fill the void left by my dad’s passing.

After all these years, I felt called to learn more about mental health and depression. The work of Martin Seligman helped me realize that my optimism was one of the key ingredients to surviving my adversity. After having worked in the sports industry for a decade, and studying in MAPP over the last academic year, I have come to realize that physical activity is one of the most salient solutions for improving one’s mental health. Physical activity and sports provide a natural setting, to teach important positive psychology concepts alongside other life skills. This capstone is about building on and spreading this message.

On Thursday, August 25th, 2022, a week prior to starting graduate school, my wife Yolanda and I welcomed our son, Jayden Kato Fung. He is a precious gift to us. Holding him in my arms, I can feel the world stopping temporarily. I never realized how much I wanted to become a father until now. Jayden adds much meaning to our family life and raising him to be physically strong and psychologically healthy, is our absolute priority. If my first 30+ years were about resilience, I want to dedicate the rest of my life to flourishing.

Positive Physical Education: Teaching Well-Being Skills Through Sport

I believe that sports, played in the right way, have a transformative role in improving our well-being. Our sports experience creates many scenarios to teach well-being skills, such as team conflict, handling losses, resiliency in the face of injury, and celebrating wins, to name a few. During the conception of this capstone, I started with the question: *Are there any sports that are good for teaching a particular positive psychology concept, such as gratitude or optimism?* I wanted to create a taxonomy covering many sports and many concepts. I soon came to realize that my own narrow sports experience, and the embryonic nature of the sports and positive psychology scientific literature may not support this big undertaking. Then when I started asking others about their own unique sports experiences, I received fascinating answers. For example, yoga practitioners believe that yoga teaches gratitude and a growth mindset – the belief that intelligence and abilities are learnable, and capable of change through effort (Dweck, 2006). Team sport allow people to build relationships, while endurance sport teaches grit – the combination of passion and perseverance, in the face of adversity for long-term goals (Duckworth et al., 2007). This capstone focuses on the sports that I know best: hiking, boxing, and basketball. These may not be your sports. However, I pledge you, the reader, to think about how we can teach well-being skills through *your* sport.

To begin, I will provide a brief description of what positive psychology is and present a high-level summary of the parallels between physical activity and sports, and the PERMA model of human flourishing (Seligman, 2011). Reviewing the latest science, I will present selected research on the mind-body connection, specifically, how the body influences the mind, and how the mind influences the body. This will give evidence that the psychological and physical benefits of sport participation are mutually supportive and synergistic, for the improvement of

our well-being. Inspired by the positive education movement, the capstone will introduce *Positive Physical Education*. This new area of inquiry aims to teach well-being skills to school-aged children through sport, with an emphasis on synthesizing sports-based positive psychology interventions, aimed at teaching well-being skills explicitly. Since the potential scope of PPE is very broad, in this capstone, I will focus on teaching three well-being skills through sport: optimism, mindfulness, and empathy. I will define these skills and concepts, discuss the benefits of each, and outline evidence-backed interventions aimed at developing these skills. Importantly, I will discuss why sports (and at times, which specific sports) can teach these skills. I will then conclude by presenting a simple curriculum outline for one sport, basketball, that teaches all three skills: optimism, mindfulness, and empathy.

Chapter 1: Introduction to Positive Psychology

The field of positive psychology is a little more than two decades old. During this time, research and the practical application of positive psychology have grown exponentially (Rusk & Waters, 2013). In order to explain what positive psychology is, I will distinguish it from mainstream (or clinical) psychology. Mainstream psychology focuses on pathology. The science of mainstream psychology has made great strides in understanding what goes wrong in individuals, families, groups, and institutions; however, any singular focus can have opportunity costs, and this came at the expense of understanding what is right with people (Gable & Haidt, 2005). In the early 2000s, Dr. Martin Seligman and his colleagues founded positive psychology through a series of meetings in Akumal, Mexico, with some of the brightest minds across the field of psychology. Their mandate was to catalyze a strengths-based approach to psychology, that allows individuals and communities to thrive (Seligman, 2002). Mainstream psychology and positive psychology are to work side by side, each as a complement to the other, for a holistic picture of human functioning (Seligman, 2002).

Positive psychology is defined as the scientific investigation into ‘the conditions and processes that contribute to the optimal functioning of people, groups, and institutions’ (Gable & Haidt, 2005, p. 103). The field is about identifying and nurturing the strongest qualities in people, what they are best at, and helping them find areas in life in which they can best live out these positive qualities (Seligman, 2002). Positive psychology studies human strengths and virtues: future-mindedness, optimism, interpersonal skills, honesty, grit, and the capacity for flow, to name several.

While Lykken and Tellegen’s (1996) set-point of happiness theory which posited that happiness is driven genetically, and unyielding to changes in behavior or life circumstances, has

been disproven, Lyubomirsky and colleagues (2005) noted that some aspects of happiness are yoked to genetics, while others are malleable. She illustrated this by suggesting, broadly, that about half of the variance can be explained by genetics, while the remaining half is driven by environmental and intentional activities. So, positive psychology interventions target what is malleable through intentional activities. They are aimed at increasing the well-being of any individual, or group, by cultivating positive feelings, behaviors, and cognition (Pawelski, 2016). Positive psychology interventions are usually short and brief, and have been scientifically empirically tested among different populations, using the latest scientific methods of inquiry (Pawelski, 2016). Perhaps the most famous positive psychology intervention is the Three Blessings Exercise: writing down three things that went well during the day, and reflecting on why they went well (Seligman, 2011).

PERMA Model of Human Flourishing

In 2011, Dr. Martin Seligman proposed the PERMA model of human flourishing (Seligman, 2011). It is a popular research-based theory of well-being in real-world application. PERMA represents **P**ositive Emotions, **E**ngagement, **R**elationships, **M**eaning, and **A**chievement. Below is a brief overview of the role of sports in eliciting positive emotions; practicing engagement; building positive relationships, creating meaning; and developing a sense of achievement.

Positive Emotions: Sports produce positive emotions, like joy, gratitude, interest, and pride. The broaden-and-build theory postulates that positive emotions widen one's cognitive thinking and builds one's personal resources to buffer against future adversities (Frederickson, 2009). We know that endorphins, dopamine, and serotonin are released during and after physical exercise, and help to elevate mood and regulate emotions (Ratey, 2008).

Engagement: The state of flow occurs when someone is completely engaged, and immersed in a task or activity (Csikszentmihalyi, 1990). In sports, it is called being ‘in the zone.’ It can be replicable in sports under the right conditions: when the challenge of the situation matches our ability, and when our attention is totally absorbed by the activity itself (Csikszentmihalyi, 1990). Sports are often done for their own sake and are inherently enjoyable (Jackson & Csikszentmihalyi, 1999). Surfing is a sport that is conducive to flow states and can reduce rumination (Boudreau, 2020).

Relationships: Individuals can benefit from the social structure afforded in a sport setting. The relationships built through sport are often long-lasting ones, bonded by a shared mission, and overcoming adversity together. Sports participation is associated with greater social competence, in large scale correlation studies with children and adolescents (Eime et al., 2013).

Meaning: Many people who have benefited from a lifelong passion for sports will say they have found meaning in their participation in sports. For example, those who engage in mountaineering, an activity that is almost entirely about hardship, with very limited pleasant experience, were mainly motivated by meaning and mastery (Loewenstein, 1999). Taking part in a sports team can make people feel that they are a part of something and have a sense of belonging.

Achievement: Successful people tend to set goals and persevere through challenges (Locke, 1996; Duckworth et al., 2007). Many people take on a sport for the challenge. For example, running a marathon can be an extremely challenging task for most people, and training and competing in a race requires grit. Grit is defined as passion for an activity, and perseverance in the face of adversity, for long-term goals (Duckworth et al., 2007). Goal-setting theory posited that the goals we set affect our actions and effort, and our actions influence goal performance

(Locke, 1996). Through sport, we can help school-aged children understand early on, goals that are both specific and difficult lead to the highest performance (Locke, 1996).

As health, physical activity, and vitality, can also be pursuits in and of themselves, some have proposed health or vitality (Norrish et al., 2013), as a separate element to PERMA. Researchers have criticized that the body is still overlooked within positive psychology, and there is a reluctance to fully embrace physical activity as a positive psychology intervention (Brani et al., 2014; Hefferon & Mutrie, 2012; Hefferon, 2015).

Positive Education

The PERMA model of human flourishing has been applied in school settings to improve the well-being of students (Norrish et al., 2013). The ‘positive education’ movement is about creating optimal functioning institutions within the education sector. It is defined simply as “education for both traditional skills and happiness” (Seligman et al., 2009, p. 293). The case for positive education was presented when Martin Seligman challenged educators and parents to consider the questions: 1) what do parents want most for their children? 2) what do schools teach? (Seligman et al., 2009). Seligman and colleagues (2009) argue that most parents want well-being for their children, while schools teach accomplishments. This discrepancy is what positive education sets out to address. The International Positive Education Network (IPEN) was conceived in 2013, to promote the double helix ‘character plus academics’ approach, where the two strands, ‘character & well-being’ and ‘academics’, are intertwined and mutually beneficial (International Positive Education Network, n.d.). Academic accolades contribute to student well-being by increasing engagement, meaning, and achievement, of the PERMA model. A student’s well-being, in turn, facilitates academic pursuits. Positive education augments traditional

approaches to education, and produces students that are both happier and smarter (Seligman et al., 2009).

The essence of positive education is strength-based education, with a focus on teaching school-aged children the skills of optimism, grit, character strengths, resilience, and a growth mindset (Seligman et al., 2009). Some educators believe that learning these skills will become a distraction from real education progress in literacy and numeracy (White, 2016), arguing that it is not the role of schools to produce ‘happy’ students. Equipped with the evidence that students’ well-being will lead to better academic outcomes, positive psychology practitioners would disagree.

The central proposition of positive education is that well-being skills lead to better academic performance, and that happiness leads to future success (Lyubomirsky et al., 2005). Empirical research tends to support this: a meta-analysis investigating the association between students’ well-being and academic achievement, reported a significant and positive but small effect size, based on correlational studies involving 54,426 participants in 81 independent samples (Kaya & Erdem, 2021). These results are consistent with Adler’s (2016) large-scale, experimental studies in Bhutan, Peru, and Mexico, that randomly assigned schools to a treatment group or a control group. A total of 782 secondary schools and 771,300 students were involved. Students in the treatment group were taught a well-being curriculum involving non-academic “life skills”, consisting of mindfulness, empathy, self-awareness, coping with emotions, communications, interpersonal relationships, creative thinking, critical thinking, decision-making, and problem-solving. Students in the control group received information on nutrition, psychology, and human anatomy. In all three countries, students in the intervention schools reported significantly higher well-being, and had performed significantly better on standardized

tests (Adler et al., 2016). Academic gains from well-being education were moderated by the quality of training provided to the local teachers; the greater the number of layers in the training program, the lower the effect size (Adler et al., 2016).

Well-being skills are complementary to academic accomplishments. Positive education aims to produce happier *and* smarter students. Moving outside of the classroom, what role does physical education (PE) play in the positive education movement? Can PE also teach well-being?

Chapter 2: Defining Positive Physical Education

The aim of Positive Physical Education (PPE) is to teach school-aged children well-being skills through sport. Sports create many ‘teachable moments’ for well-being. Playing sports generates an abundance of scenarios, such as team conflict, losing, and resiliency in the face of injury, for teaching well-being skills under the right guidance. It is an important channel to reach school-aged children.

Traditionally, the role of PE was to increase the physical fitness of students and teach them physical competency to lead active and fit lives (Biddle & Mutrie, 2007). The eudaimonic turn is the increasing focus of attention among scholars and practitioners, to investigate the constituents of well-being, and the conditions of human flourishing within an established discipline (Pawelski & Moores, 2013). The eudaimonic turn has already begun within education, as discussed, through the introduction of positive education in schools (Seligman et al., 2009), and within arts & culture, through positive humanities (Pawelski & Moores, 2013). Physical and sports education is now ripe for the eudaimonic turn.

There is now a robust body of scientific evidence that shows the psychological well-being benefits of physical activity and sports (Faulkner et al., 2015; Lubans et al., 2016; Plante & Rodin, 1990; Hefferon & Mutrie, 2012). Recent research & development in neuroscience reveal

that physical activity and sports participation, have important implications for cognition, learning socio-emotional competencies, optimizing our mind-body connection, and improving academic success among students (Sattelmair & Ratey, 2009; Donnelly et al. 2016; Sibley & Etnier, 2003). A modern PE curriculum should thus expand to encompass the latest science.

PPE can incorporate sport-based positive psychology interventions, that are specifically designed to be integrated into a sport setting and harness the physiological and psychological benefits of physical activity and sports. For example, evidence-based inventions like ‘Expressing Gratitude’ can be infused into a team sport setting, such as basketball, to increase the pro-social behavior of school-aged children. Adopting the PERMA theory of well-being (Seligman, 2011), these interventions are aimed at creating positive emotions; practicing engagement & flow; building positive relationships, creating meaning, and developing a sense of achievement. There is a gap in the literature in understanding the specificities of various sports and their relationship with positive psychology concepts, leaving unexplored, the unique characteristics found in a variety of sports, and their ability to teach well-being skills. For example, yoga is great for teaching mindfulness, as the synchronization of body movement and breath, provides a focal point for mindful awareness.

PPE can be a sub-branch of positive education that emphasizes the holistic well-being of school-aged children. It can become a point of difference for schools looking to achieve a more balanced approach, to teaching traditional academic skills and well-being skills. Some real-world applications of integrating positive psychology into school sports are already underway. In Geelong Grammar School, students aged 14 and 15 (i.e., year 9) spend the entire academic year at Timbertop, a full-boarding campus based in regional Victoria, Australia. There, students explore the natural environment through hiking, running, skiing, and outdoor adventures, and

spend one lesson per fortnight studying positive education, with a particular focus on resilience skills (Norrish et al., 2013). In St Peter's College of Adelaide, Australia, a Positive Sports Coaching program was introduced, with the aim to enhance individual student engagement in sports and promote well-being. The curriculum is built around the science of character strengths, optimism, and process praise (White & Waters, 2015). Teachers, coaches, and players were trained to use a strengths-based approach during sporting activities at St Peter's College (White & Waters, 2015). Anecdotally, participants reported increased resilience when overcoming losses, quicker forgiveness for teammates' mistakes during games, and stronger team spirit (White & Waters, 2015).

Why is Positive Physical Education important?

Addressing the Youth Mental Health Crisis

Globally, the mental health epidemic is a serious concern among our youth today. During COVID-19, the global estimate of mental health issues in youths has been studied in a meta-analysis involving 1,389,447 children and adolescents (Deng, 2023). The prevalence of depressive and anxiety symptoms are high at 31 percent and 31 percent respectively (Deng, 2023). Research shows that Australian children and adolescents experienced considerable levels of mental health symptoms during the initial phase of COVID-19: 20.2 percent and 20.4 percent of children aged four to 17 years, were in the clinical range for anxiety and depressive symptoms respectively (Sicouri et al., 2022). In Hong Kong, between 34 percent to 42 percent of students feel low or nervous, and are irritable or bad-tempered, at least once a week (Ho, 2021). Hong Kong students' score on the life satisfaction scale, is much lower than the global average (6.97 versus 7.8) (Ho, 2021). Many schoolchildren across the world suffer acute anxiety from

academic and examination pressures, and in developed countries like the US, Australia, and Hong Kong, test anxiety measures are worse than that of the OECD average (OECD, 2017).

Physical activity appears to be under-utilized as interventions to address the current mental health epidemic. The recommended active hours for schoolchildren are 60 minutes each day, and only 20 percent meet this standard globally (Faulkner et al., 2015). Schoolchildren in Hong Kong have abysmal exercise rates, that are worse than in most other places: more than 60 percent of the students reported that they exercised less than three days a week, and more than one-fifth said they did not exercise at all (Ho, 2021). In 2022, the US, Australia, and Hong Kong, all received a score of “D-” for overall physical activity in the *Active Healthy Kids Report Card on Physical Activity for Children and Adolescents* (Aubert et al., 2022). Globally, there is an urgent need to improve both the physical health and mental well-being of our school-aged children. PPE plays a role in promoting the prevention and alleviation of mental health problems, such as depression, stress, and anxiety, and the development of protective well-being skills for navigating the vicissitudes of life.

Experiential Well-Being Education

Experiential learning is the practice of learning through doing (Kolb & Kolb, 2005). It encourages the students to have first-hand experiences with the taught material and improves students’ memory and application of the concepts (Kolb & Kolb, 2005). Students engage in learning through reflective observation, and then reconciling the differences between the learned content and the experience. Following reflection, students create their understanding of the way in which the information can be applied. Sport-based interventions fit the modality of experiential learning. Experiential activities in a sport setting engage students more actively than traditional methods (Kolb & Kolb, 2005). Students can readily apply the taught material in a live

setting, such as through their social interaction with team members and in competitive situations. For young children, if some concepts are too abstract, students may become bored and less engaged in a traditional classroom setting. This attunement to the target audience makes experiential learning through sport appropriate for school-aged children.

The Upward Spiral of Mind-Body Connection

Sport-based positive psychology interventions can be very effective interventions due to the ‘stacking effect’ of psychological and physical benefits of physical activity and sports. For example, a young participant in a martial arts program will benefit from improved cardiovascular fitness, increased self-esteem from better self-defense abilities, and could be taught the benefit of gratitude through a simple *Three Blessings* intervention. The psychological and physical benefits are mutually supportive and synergistic for the ‘upward spiral’ towards improved well-being. Figure 1 (below) outlines the three levels of psychological and physical benefits of PPE, their intentionality, and examples of the benefits at each level.

Figure 1**Benefits of PPE**

Positive Physical Education		
Harnessing physical and psychological benefits for holistic well-being		
Physical or psychological benefits	Intentionality	Examples
3. Taught well-being skills Well-being skills are taught through sport-based interventions	Well-being as a proper goal in its own right	Optimism Mindfulness Gratitude Psychological literacy
2. Inherent psychological benefits Psychological well-being benefits from better fitness and physical literacy	Well-being benefits as a 'byproduct'	Physical self-concept Mood & affect Stress responsivity Cognition
1. Physical benefits Physical fitness Physical literacy	For better physical health Prevent obesity	Body Composition Strength Cardiovascular Fitness Flexibility Muscular Endurance

1) Physical Benefits

Much aligned with the outcomes of a traditional PE curriculum, students who participate in physical activity and sports, benefit from better physical fitness and health, alongside increased physical literacy. Physical literacy is defined as the ability to move with expected confidence (Whitehead, 2013). Examples of physical benefits include a better body composition, increased strength, improved cardiovascular fitness, greater flexibility, and higher muscular endurance. Improved cardiovascular fitness reduces the risk of obesity, and enhances performance in other sporting activities (Biddle & Mutrie, 2007).

2) Inherent Psychological Benefits

Participation in physical activity and sports improves students' psychological well-being. People who play sports are likely to have a more positive physical self-concept (Lubans et al., 2016), improved mood (Biddle & Mutrie, 2007), and better stress reactivity (Ratey, 2008). These are the inherent psychological well-being benefits (or 'byproduct') of physical activity and sports, that educators may or may not recognize. Research shows that athletes scored higher on traits, such as emotional intelligence, empathy, mental toughness, resilience, and hardiness, compared to those who do not participate in sports (Laborde et al., 2016; Shima et al., 2021).

3) Taught Well-Being Skills

Positive psychology concepts are intentionally taught in a sports setting. Instead of a focus on performance with an overemphasis on winning and losing, well-being is a proper goal in its own right. Sport-based positive psychology interventions are specifically designed and integrated into a sports setting. Similar to the exemplars of Geelong Grammar School and St Peter's College, the skills of optimism, resilience, gratitude, and mindfulness are explicitly taught.

PPE aims to teach school-aged children well-being skills through sport. It harnesses the physiological and psychological benefits of physical activity and sports. The latter may incorporate sport-based positive psychology interventions, that are specifically designed to be integrated into a sport setting, and explicitly teach well-being. The latest scientific evidence is starting to reveal the mutually supportive and synergistic nature of physical and psychological well-being, which is the focus of the next chapter: the Mind-Body Connection.

Chapter 3: Mind-Body Connection

Understanding the mind-body connection, and the mechanism at play, is fundamental to the development of PPE, and sport-based positive psychology interventions. Mind-body connection describes the phenomenon where our thoughts, feelings, beliefs, and attitudes either positively or negatively affect our biological functioning, and vice versa. There are psychological well-being benefits when we develop our bodies to become fitter and stronger. And when we train our minds, our physiological functioning also improves. The ‘upward spirals of the heart’ theory supports this bidirectional relationship between the mind and the body (Kok & Fredrickson, 2010). Kok & Fredrickson found that adults with greater autonomic flexibility (a physiological phenomenon), increased in social connectedness and positive emotions (psychological assets) more rapidly than others. Furthermore, increases in social connectedness and positive emotions, in turn, predicted greater autonomic flexibility, forming an ‘upward spiral’ towards improved well-being (Kok & Fredrickson, 2010).

Recent research has shown a much closer connection between the mind and the body. For example, the field of psychoneuroimmunity is dedicated to examining the bidirectional link between neuropsychological processes, stress, and the immune system (Littrell, 2008). It should be acknowledged that the mind and the body are constructs to help us understand the underlying human experience. Mind-body dualism is a metaphysical stance that views the mind and the body as two distinct entities (Mehta, 2011). This dualistic stance of human nature has become the basis of the biomedical model in medicine, including the separation of physical health and mental health (Mehta, 2011). Many have pointed to the problematic separation of the mind and the body, as it diminishes the mind’s role in the experience of health (Mehta, 2011). In cancer treatment, interventions targeting the psychological and emotional burden of cancer continue to

be marginalized due to the prevailing mind-body dualism (Salvy, 2021). At times, it can be difficult to draw a clear distinction between the two, when discussing mind-body research. In this chapter, I first discuss how the mind influences the body, specifically, how psychological well-being and our mindset affect our physical health and positive health behaviors. Then I will turn to how the body influences the mind, and present research on the impact of physical activity on our subjective well-being, mental health, the autonomic nervous system, cognition, and academic outcomes.

How the mind influences the body

Physical Health

The link between positive psychological well-being and physical health is an important area of exploration for researchers in the field of positive psychology. In a comprehensive review of the literature on psychological well-being and cardiovascular health, researchers found that dispositional optimism is most associated with a reduced risk of cardiovascular events (Boehm & Kubzansky, 2012). In a longitudinal study of 97,253 women from the Women's Health Initiative who were free of cardiovascular disease at study entry, optimistic females had up to a 30 percent reduction in heart disease or heart disease-related mortality risk eight years later (Tindle et al., 2009). Boehm and colleagues (2012) posited that people with greater positive psychological well-being tend to engage in health behaviors, such as physical activity, eating a healthy diet, and avoiding smoking, which are mediators in the prevention of cardiovascular disease.

Psychological well-being is a key component to consider when managing physical health and promoting longevity.

Positive emotions are linked to positive health outcomes. The broaden-and-build theory postulates that positive emotions, like joy, gratitude, and awe, widen one's cognitive thinking

and builds one's personal resources to buffer against future adversities (Frederickson, 2009). Fifty-seven undergraduate students were asked to prepare a three-minute speech in 60 seconds, on a to-be-determined topic, attached to measure cardiovascular data (Tugade & Fredrickson, 2004). In actuality, participants did not have to deliver the speech. During this time, physiological changes were monitored using sensors, and affect was self-reported through questionnaires. The study found that high-resilient individuals exhibit more positive emotions during the test, which help 'undo' the cardiovascular negative aftereffects, by returning to baseline heart rate and blood pressure quicker than low-resilient participants (Tugade & Fredrickson, 2004). Positive affect is also linked to lower levels of proinflammatory cytokine production, which in turn predicts better physical health (Stella et al., 2015).

The Power of the Mind (and Placebo)

The mind can promote positive health behaviors in many interesting ways. A study from Harvard University examined the placebo effect of physical activity. Eighty-four female room attendants working in seven hotels were randomized to either: an experimental group where they were told that the work they do is sufficient to meet the CDC's recommendations for an active lifestyle and were given details about the caloric expenditure in a variety of housekeeping work, or a control group where no such information was given (Crum & Langer, 2007). Despite not reporting any increase in exercise outside of work or an increase in workload, after only four weeks, the participants in the experimental group lost an average of two pounds, lowered their systolic blood pressure, and had marked improvement in health measures, such as body-fat percentage, body mass index, and waist-to-hip ratio (Crum & Langer, 2007). None of these measures improved for the control group. This study suggests that physical health may be affected by mindset, independent of behavior change, although more research is needed to

confirm this (for instance, it is unclear whether a more positive construal of physical activity in the active group caused them to put more energy into the same activities, yielding better outcomes). It does suggest the possibility, however, that mindset may be crucial in helping people reap the full benefit of physical activity.

The power of the mind has also been empirically tested in people's responses to stressful events, and their appraisal of stressful situations. Fifty subjects participated in an experiment to learn to reappraise physical arousal during a stressful task (the Trier Social Stress Test), as functional and adaptive (Jamieson et al., 2012). In the experiment group, the intervention consists of reading three summaries of journal articles on the benefits of reappraising arousal. A more positive stress belief helped participants in the experiment group reduce negative affect, improve cardiovascular functioning (as measured by increased cardiac efficiency and lower vascular resistance), and decrease attentional bias, compared to the control groups (Jamieson et al., 2012). A change in mindset, such as reappraising arousal can have physiological and cognitive benefits.

Embodied Emotions

Emotions, like stress, are whole-body experiences, contrary to the view that emotions are understood and perceived 'in the head.' A study used guided imagery via short stories and movies to induce various emotions in 701 participants (Nummenmaa et al., 2013). The participants were asked to color in a body map, to depict where they felt increasing or decreasing bodily activity. Results show that different emotional states (i.e., happiness, sadness, pride, depression, etc.) are associated with topographically distinct bodily sensations. For example, love and happiness were associated with activation in the upper body, and sadness was associated with deactivation in the limbs. An accurate labeling of emotions is often the first step

in our ability to regulate them. Negative emotions are the body's in-built alarm system, telling us that a health issue or a life-threatening situation demands more of our attention (Ratey, 2008). One study found that when a person suppressed their emotions during a conversation, both people exhibited physiological reactions consistent with a threat (Peters et al., 2014). The body and its physical state can have a significant effect on shaping our emotions too. Postures, gestures, and facial expressions directly affect the experience of positive mood, negative affect (e.g., anger and guilt), feelings of success, and achievement (Hefferon, 2015). Experiments show that conjuring a smile can actually make us experience positive affect (Kleinke et al., 1998). In sum, emotions are both a cognitive process, and a felt sensory experience in the body.

How the body influences the mind

Physical Activity and Subjective Well-Being

There are many psychological well-being benefits when we develop our bodies to become fitter and stronger. Physical activity is associated with higher life satisfaction and “feel good” effects. One way of measuring this is operationalized through the construct of subjective well-being, which measures positive and negative affect and life satisfaction, or people's cognitive and affective evaluations of their lives (Diener et al., 1999). Research shows that physical activity is associated with higher levels of subjective well-being (Buecker et al., 2021; Wiese et al., 2018). A meta-analysis reviewing a range of physical activity interventions found a small positive effect on subjective well-being, independent of the prior fitness level of the participants (Buecker et al., 2021). One small-scale comparative study looked at the subjective well-being of hockey players and health club members (mainly resistance exercisers), with non-exercising students (Edwards et al., 2004). Both hockey players and health club members had greater subjective well-being and had more positive physical self-perception than non-exercising

students (Edwards et al., 2004). It has been suggested that physical activity enhances physical self-perception and is a pathway to global self-esteem (Biddle et al., 2019). As discussed earlier, physical activity is hypothesized to increase subjective well-being, as it is connected to all the components of PERMA (Seligman, 2011).

Faulkner and colleagues (2015) refer to physical activity as a “stellar” positive psychological intervention, that helps to produce positive emotions (the “feel good” effects), engagement (flow), and achievement (goal setting). Although a complex relationship exists between exercise intensity and affective response, in most individuals, moderate levels of exercise are associated with the “feel good” effects (Ekkekakis et al., 2011). However, over-exercising can lead to negative affects from fatigue, injury, and exhaustion. Experimental trials have supported the relationship between moderate exercise and increased positive mood and affect (Biddle & Mutrie, 2007). Potential neurobiological explanations for “feel good” effects include the release of endorphins, dopamine, and serotonin, during and after physical exercise, which helps elevate mood and regulate emotions (Ratey, 2008). A ‘runner’s high’ is an example of the possible euphoric state experienced during physical activity. The psychological well-being benefits of physical activity are multi-faceted, and have been examined in the positive psychology literature, including enhancing self-acceptance (e.g., self-esteem), offering autonomy, gaining environmental mastery, fostering positive relationships, giving new purpose in life, and overall personal growth (Hefferon & Mutrie, 2012).

Physical Activity and Mental Health

The evidence for the association between physical activity and mental health outcomes is strong for the clinical and nonclinical adult population (Rebar et al., 2015). The remediation of depression is often seen as the mental health outcome most clearly associated with physical

activity (Smith & Blumenthal, 2013). Experimental studies comparing physical activity interventions and antidepressants yield positive and repeatable results, in favor of physical activity (Babyak et al., 2000; Blumenthal, 2007). One hundred and fifty-six adult volunteers with major depression who were randomized to an exercise group (three supervised aerobic exercise sessions per week for four months), attained declines in depression equal to those of a group that received antidepressants (Babyak et al., 2000). Even after six months post treatment, the exercise group was less likely to relapse than the medication group (Babyak et al., 2000). Authors noted that a sense of personal mastery and positive self-regard, was likely to play a role in the depression-reducing effects of exercise. In a follow-up study involving 202 patients with major depressive disorder in a randomized controlled trial (RCT), both supervised aerobic exercise and home-based aerobic exercise, were shown to be as effective as antidepressant medication, and more effective than the placebo pill group, after four months of treatment (Blumenthal, 2007). By including a home-based aerobic exercise option, social support was shown to be not necessarily critical to the therapeutic benefit of exercise (Blumenthal, 2007). High-intensity exercise regimens are generally more effective than low-intensity regimens at treating anxiety (Aylett et al., 2018).

There is also sound evidence for the positive association between physical activity and the mental health of young people, but the evidence is not sufficient to establish causality (Biddle et al., 2019). A comprehensive review (including 42 meta-analyses) was conducted, with the aim to determine the extent at which the associations between physical activity and mental health outcomes in children and adolescents can be considered causal (Biddle et al., 2019). Three areas were investigated: depression, self-esteem, and cognitive functioning. Whilst there is a positive association of physical activity with all three outcomes, Biddle and colleagues (2019) found:

partial support for a causal association with lower depression; a lack of support for self-esteem; and strong support for cognitive functioning. They noted that the underlying mechanisms explaining changes in mental health due to physical activity remain ‘imprecise’ (Biddle et al., 2019, pp. 147). The problem with establishing a causal link between physical activity and mental health outcomes may be attributed to the inconsistent experience of the intervention (e.g., dosage, the variability of psychosocial elements, and others). The lack of standardization makes research in physical activity, and to a much larger extent in sports, difficult.

A conceptual model was proposed, outlining the possible mechanisms that underly the improvement of mental health outcomes through physical activity in young people (Lubans et al., 2016). The possible mechanisms are: 1) neurobiological (changes in the structural and functional composition of the brain); 2) psychosocial (physical self-concept, social connectedness, mood, and emotion regulation); and 3) behavioral (sleep, coping, and self-regulation skill). This meta-analysis of 25 studies (of which 20 are RCTs) only found strong support for improved physical self-concept as a pathway to self-esteem and well-being (Lubans et al., 2016). Unfortunately, unlike the adult population, there was an insufficient number of studies to support the causal relationships for the remainder of mechanisms for young people. A more recent study in the Netherlands, involving a sample of 4,216 youth, reviewing the neurobiological, psychosocial, and behavioral mechanisms of physical activities, also found self-esteem improvement as a mediator to improved mental health (Rodriguez-Ayllon et al., 2023).

Researchers have investigated the type of physical activity and sports that are best at reducing mental health burdens. Between 2011 and 2015, over 1.2 million individuals in the US (aged 18+) participated in a cross-sectional study, comparing the number of days of bad self-reported mental health between individuals who exercised and those who did not (Chekroud et

al., 2018). The activities with the greatest reduction in mental health burden were team sports, cycling, aerobic/gym activities, and running, ranging between ~18-22 percent reduction in bad mental health days, compared to no exercise (Chekroud et al., 2018). The authors noted that the findings were consistent with other studies that show that social activity promotes resilience to stress, reduces depression, and minimizes social withdrawal and feelings of isolation (Chekroud et al., 2018). The study also found evidence for optimal ranges of exercise duration (45 minutes) and frequency (between three and five times per week) for reducing mental health burdens, and that longer and more frequent exercises were not always better. In summary, the evidence for the mental health benefits of physical activity is strong for the adult population, while more research is required to establish causality or fully understand the mechanisms at play among young people.

Managing Stress

Chronic, unrelenting stress can lead to mental health disorders, like depression and anxiety. The autonomic nervous system is essential to how we manage stress and respond to stressful events and offers a lens into the physiological mechanisms at play. The autonomic nervous system regulates our body's response to threats, and the automatic responses in our organs (Ratey & Manning, 2014). There are evolutionary reasons as to why a large part of our stress response operates outside of our consciousness. The 'fight-or-flight' response, activation of our sympathetic nervous system (SNS), is triggered outside of our consciousness when we are under imminent threat, so that the response is instantaneous. This is a state of arousal: increasing heart rate and blood pressure, gearing us up for a fight, or running away as fast as we can from the predator. The digestive and immune systems shut down temporarily, allowing resources to be allocated to the more important body functions at the time. On the other hand, our

parasympathetic nervous system (PNS) controls the natural relaxation response, and helps balance out the arousal response, by slowing the heart rate and blood pressure, among other things, especially after being in the ‘fight-or-flight’ mode. The optimal functioning of the SNS and PNS is the key to managing stress. Common among people who have experienced trauma, the failure of PNS to perform, will result in chronic stress that leads to a variety of physical and psychological maladaptation (Ratey & Manning, 2014). The oscillation between arousal and relaxation is adaptive and leads to better physical and psychological health.

Vagal Tone (VT), as indexed by heart rate variability (HRV), is a biomarker of how well the SNS and PNS are functioning (Porges, 1995). According to Porges, it is a measurable, readable physical manifestation of our state of mind, a pulse to our psychological well-being (Porges, 1995). It has been suggested as a biomarker for measuring the progress in self-regulation in young people participating in social-emotional learning (SEL) programs (Blank, 2019). High VT (and high HRV) indicates that the individual is flexible and adaptable to his or her environment (Porges, 2007), with a greater ability to return to a calm and relaxed state after arousal. This is also known as the vagal brake (activation of PNS). Physical activity elicits a state of arousal and offers the opportunity to train the body for the optimal activation of SNS and PNS. The ability to relax and recover after intense bouts of exercise is important and should be emphasized. Research shows that physical activity increases VT (Gregoire et al., 1996). Compared to other biomarkers, HRV was shown to be most strongly correlated with a self-rated physical health measure in 3,942 adults (Jarczok et al., 2015). The intensity of physical exercise is associated with the improvement in VT: the more intense the exercise, the higher the impact on VT (Buchheit et al., 2007). However, instead of exercises that mimic our flee response, and cause anxiety, Ratey and Manning (2014) suggest group play and exercises that include social

engagement with teammates and competitors, where arousal and engagement (openness) are both activated.

If we want our children to be antifragile, we must introduce *intermittent* stressors and challenges in their everyday lives, so that they can learn, adapt, and grow, to become strong and independent individuals (Lukianoff & Haidt, 2019). This is called stress inoculation, whereby limited doses of stress can cause brain cells to overcompensate, optimize our autonomic nervous system, and develop better protection against future demands (Ratey, 2008). Similar to a dress rehearsal, physical activity can help young people inoculate against stress, by reducing reactivity and promoting quicker recovery from increased heart rate, blood pressure, and muscle tension (Ratey, 2008) – effectively managing the ‘fight-or-flight’ response.

The workings of the autonomic nervous system reinforce the mind-body connection and explain why so many issues deemed to be psychological, play out in the body: digestive issues, cardiovascular problems, and poor immune response, to name a few (Ratey & Manning, 2014).

Cognition and Academic Outcomes

Perhaps the most underappreciated benefits of physical activity for young people are brain development and learning. Physical activity has a profound impact on cognitive functioning, learning, and memory, through the release of brain-derived neurotrophic factor (BDNF) (Voss et al., 2011). In layman’s terms, BDNF is likened to the fertilizer for the growth of brain cells, and helps maintain the brain’s infrastructure, earning the name ‘Miracle-Gro’ (Ratey, 2008). It was experimented with animal models when van Praag and colleagues (2005) found that exercising mice improved the acquisition and retention of learned behaviors, and declined neurogenesis in aged mice. BDNF was found to affect the neuroplasticity of the hippocampus, a brain region central to learning and memory (Cotman and Berchtold, 2002).

A case study of the Naperville, Illinois District 203, demonstrated the positive association between physical activity and academic success within a school setting (Ratey, 2008). The district institutionalized the Zero Hour PE, where school students partake in PE class before school, and the results were staggering: a mere three percent of freshmen were overweight or obese (compared to the state average of 33 percent), and the district became number one in science and number six in math in the world, using an international benchmarking test comparing eighth-grade students (Ratey, 2008). The case study also demonstrated the motivational power of fitness-based programs, rather than performance-based programs, for improving the cognitive capacity of young people, and using biomarkers, such as maximum heart rate, to measure and track progress. Rather than comparing against others (in sports performance), students were encouraged to compare against their own past best efforts – a hallmark of a growth mindset (Dweck, 2006).

There is a longstanding belief that physical movement is an essential part of a child's overall physical and cognitive development. A meta-analysis of 44 studies shows a positive relationship between physical activity and cognitive performance, in school-aged children across perceptual skills, IQ, verbal tests, and mathematics tests (Sibley & Etnier, 2003). A more recent and extensive meta-analysis in 2016, involving 137 eligible studies, also highlighted the positive associations among physical activity, fitness, cognition, and academic achievement in children aged five to 13 (Donnelly et al., 2016). They concluded that physical activity and aerobic fitness were beneficial for brain structures and functioning, including executive functioning and working memory. However, the study highlighted a lack of good-quality experimental studies on physical activity and academic performance, to establish a causal relationship (Donnelly et al., 2016). Principally, the literature suggests no indication that increases in physical activity will

negatively affect cognition or academic achievement (Donnelly et al., 2016). These findings point to the prevailing misconception, that physical activity and sport participation takes time away from academic pursuits and are not aligned with the educational goal of the school system. In fact, a reduction in time for PE can have detrimental effects on children's lifelong passion for an active lifestyle and mental well-being.

The review of the literature on mind-body connection offers a foundation, on which to build sport-based interventions, targeting psychological skills and physical fitness. The mind and the body are mutually supportive: psychological skills build healthier bodies, and healthier bodies build psychological well-being. I have already touched on the physical health benefits of optimism, and in the next chapter, I will expand on its benefits, and investigate whether optimism can be taught through sport.

Chapter 4: Can Optimism be Taught Through Sport?

"So I've been hearing this phrase y'all got over here that I ain't too crazy about. 'It's the hope that kills you.' Y'all know that? I disagree, you know? I think it's the lack of hope that comes and gets you."

- *Ted Lasso*

Optimism is an imperative construct within the field of positive psychology. Optimism is a key theme of the television show *Ted Lasso*. In the show, the protagonist coach is purposeful in helping professional soccer athletes at the Richmond Football Club become the best versions of themselves, and in doing so, instilling a sense of hope in these athletes. Optimism is associated with many psychological well-being and physical health benefits (Milona, 2020). In this chapter,

I will first define and outline the benefits of optimism. I will focus on empirical research that investigates the benefits of optimism in life and in the sport context. I will present the case that optimism is not only crucial in sports and in sports performance, but also that sports can be a vehicle to teach people the skills of optimism. I will conclude by highlighting several factors that make sports an important avenue to teach optimism to school-aged children, and design sport-based interventions aimed at increasing optimism, an area in the field that has received little attention.

Broadly, there are two ways to operationalize optimism: 1) dispositional optimism, and 2) explanatory style (Carver et al., 2010, Seligman, 2006). Dispositional optimism is having positive expectations of the future (Carver et al., 2010). A dispositionally optimistic person has a general tendency to expect that things will go well for them. A pessimistic person, by contrast, has a general tendency to expect that things will go poorly for them. Explanatory style, simply put, is the way in which we explain positive and negative events (Seligman, 2006). It is people's inner and habitual causal explanations, as to why positive or negative things happen in various situations. There are three dimensions to this construct: stable-unstable; local-global; and internal-external. People who generally explain negative events to be caused by things that are unstable ("this won't last forever"), local ("this won't spill over to other areas of my life"), and external ("due to external forces, e.g., luck") have an optimistic explanatory style. A person with an optimistic explanatory style will hence explain positive events with stable, global, and internal causes. In contrast, a pessimistic person tends to think that negative events are stable ("this always happens to me"), global ("I'm bad at everything I do"), and internal ("it's my fault") (Seligman, 2006).

The concept of optimism is intricately tied to the literature on resilience. Optimism is a common protective factor across many resilience frameworks (Southwick & Charney, 2018, Reivich & Shatté, 2002). An optimistic explanatory style can be learned (Gillham et al., 2001, Seligman, 2006), and teaching the skills of optimism, is one of many components of programs aimed at building resiliency in individuals and teams. One such program is the Penn Resiliency Program (PRP) that teaches optimism through cognitive restructuring (Brunwasser et al., 2009). Cognitive restructuring is a process of replacing negative thinking patterns with more accurate thinking patterns (Seligman, 2006). Effort and taking action are mediators of optimism to produce positive outcomes (Rettew & Reivich, 1995), and optimistic thinkers are more likely than pessimistic thinkers to: notice the positive; see opportunity; accept and control the situation; focus on the solution; take purposeful action; and reach out to others (Reivich & Shatté, 2002).

Benefits of optimism

Research has shown that having an optimistic mindset is associated with many psychological well-being outcomes and physical health benefits, including better grades (Solberg Nes, Evans, & Segerstrom, 2009), lower depressive symptoms (Brunwasser, Gillham, & Kim, 2009), higher future income for college students (Segerstrom, 2007), better social relationships (Milona, 2020), and improved physical health (Scheier & Carver, 2018; Boehm & Kubzansky, 2012). There are 17 studies involving close to 2,500 children, that have evaluated the efficacy of the PRP. The program teaches both cognitive skills based on adult cognitive behavior therapy (CBT; evaluating negative thinking patterns) and social-problem-solving skills (e.g., conflict management, negotiation, and relaxation) to children, usually in a school setting. A meta-analysis reviewing the program's impact has found that children who participated in the PRP

reliably had fewer symptoms of depression over time for 12 months post-intervention, compared to children who received no intervention (Brunwasser, Gillham, & Kim, 2009).

Several correlational studies have shown that optimism improves sports performance in athletes and teams (Rettew & Reivich, 1995), especially the ability to recover from defeat and handle adversity in sports. One such study investigated explanatory style and the ability of teams to 'bounce back' from a loss in a professional basketball context (Rettew & Reivich, 1995). Those with optimistic explanatory styles (gathered from media reports) were more likely than those with pessimistic explanatory styles to come back from a loss by winning the next game (Rettew & Reivich, 1995). This professional basketball study found that the way teams explained a bad event (i.e., loss of a game) is a better predictor of resilience, than an optimistic explanation for a good event, offering support that reframing explanations for adversities in sports, can be used as a technique to build optimism (Rettew & Reivich, 1995). In addition to elite team sports, explanatory styles have been studied among individual swimmers. Seligman and colleagues (1990) gave 33 university varsity swim team members false feedback of slower swim times after they performed their best event in an experimental study (i.e., they were manipulated to think that they performed poorer than they actually did). Findings showed that the performance of swimmers with a pessimistic style deteriorated in the next race, whilst swimmers with an optimistic style did not (Seligman et al., 1990). This illustrates, consistent with the soccer and basketball studies (Gordon, 2008; Martin-Krumm et al., 2003), that athletes with a more optimistic explanatory style recover better following defeat, than athletes with a pessimistic explanatory style. These results have been replicated in community sport too, not just among elite athletes, whereby 62 high school students performed a basketball dribbling trial and were given false feedback. Participants with an optimistic explanatory style were less anxious

(assessed by heart rate acceleration), more confident, and performed better than participants with a pessimistic explanatory style (Martin-Krumm et al., 2003).

A separate strand of optimism research studies the improvement in performance, when athletes are taught the skills of optimism in a classroom setting. Thirty-six national-level adolescent swimmers participated in a psychological skills training program for 45 minutes per week, over seven weeks (Sheard & Golby, 2006). One of the skills, among a palette of five psychology skills, is *thought stopping*, where swimmers learned to replace negative thoughts with positive ones and is intended to improve their dispositional optimism. Findings demonstrated that gains were seen in 10 separate swimming events, but only three of which were statistically significant one-month post interventions (Sheard & Golby, 2006). In summary, there is strong evidence to suggest that athletes with an optimistic explanatory style, or athletes that are upskilled in an optimistic explanatory style, perform better in comparison to their baseline, suggesting that optimism provides an advantage in sports performance, and in the ability to cope with adversity in sports.

Interventions for increasing optimism

Cognitive restructuring is a technique that is used to help athletes challenge and change negative thought patterns (Seligman, 2006). The ABCDE model is a practical framework for this intervention (Seligman, 2006): **A**dversity: An athlete faces a challenging situation (e.g., missing a crucial goal in a soccer match); **B**eliefs: The athlete forms negative beliefs about the situation (e.g., "I'm a terrible player and always mess up"); **C**onsequences: These negative beliefs lead to emotional and behavioral consequences (e.g., feeling demoralized and underperforming in future games); **D**isputation: The athlete is guided to challenge and dispute these negative beliefs (e.g., considering past successes or recognizing that everyone makes mistakes); and **E**nergization: By

replacing negative beliefs with more optimistic and realistic ones (e.g., "I can learn from this and improve"). The ABCDE model is a key component of the PRP, that has demonstrated with efficacy, the ability to promote an optimistic mindset and reduce pessimistic ones, in various populations (Brunwasser et al., 2009).

A second intervention, attribution retraining, focuses on altering an athlete's attributions, or the reasons they assign for their success or failure (Miserandino, 1998). Studies have shown that attributing failure to a lack of ability is detrimental to future motivation and performance (Gillham et al., 2001). The goal of attribution retraining is to develop mastery-oriented attributions in young athletes, where failure is attributed to the lack of effort ("try harder next time"), rather than lack of ability, and success is attributed to the presence of acquired ability (Miserandino, 1998). A small study with 11 high school varsity basketball team members, found a very large effect of attributional retraining on improvement in basketball shooting and more mastery-oriented attributions, after weekly practices over a duration of four weeks (Miserandino, 1998). The subjects were split into two groups: the 'blinded' head coach provided feedback to a control group based on shooting technique, and the assistant coach provided feedback based on attribution retraining to the experimental group. Feedback from the assistant coach attributed good plays to the presence of ability (e.g., "great improvement"), and bad plays to the lack of effort ("keep working", or "concentrate on that a little more") rather than to the lack of ability. This study demonstrated that a small change to the language used in feedback can have larger effects on the athlete's mindset. Attribution retraining interventions are less cognitively demanding than the cognitive-restructuring, accessible to younger children (Gillham et al., 2001), and could be easily applied in a sport setting, by working with coaches to improve their coaching instructions (Miserandino, 1998). Other research has been able to successfully change

performance-related attributions in novice tennis players (Orbach, Singer, & Price, 1999) and novice golfers (Rasclé et al., 2008).

Finally, the “Best Possible Self” intervention – a future-oriented intervention of imagining one’s best possible self in various future timeframes (one-, five-, and 10-years) - has been shown to be effective in improving optimism and is self-administrated (Meevissen et al., 2011). Researchers found that optimism can be boosted by spending as little as five minutes each day imagining one’s ideal self (Meevissen, 2011). A meta-analysis of 29 randomized controlled intervention studies with a total of 3,319 subjects, found the “Best Possible Self” intervention to be the most effective (i.e., largest effect size) in improving disposition optimism (Malouff & Schutte, 2017). Other intervention methods tested in studies include self-compassion training, coping training, cognitive-behavioral therapy methods, mindfulness-based interventions, and psychodrama. An adaptation of the “Best Possible Self” intervention can be applied to team sports, where each member of the team contributes to envisioning the ideal team.

Why is sport a good avenue to teach optimism?

Setbacks and Adversities

If an individual’s perception of success and failure is key to building an optimistic mindset, sports create many of these opportunities in both practice and competition. Given the competitive nature of sports, and that success and failure are often defined as winning and losing, sports present many training opportunities to cope with setbacks and adversity. With the ever-increasing focus on sports analytics, real-time feedback on success and failure can be used to facilitate optimism interventions, which is hard to achieve in other domains of life (Rettew & Reivich, 1995). This also allows for the real-time correction of maladaptive thinking styles. Research in optimism and sports performance leverages this unique aspect of sports, to develop

objective measures (i.e., media report analysis) of explanatory style beyond self-reported measurement (Rettew & Reivich, 1995).

The Role of Luck

Luck is an inherent part of sporting successes and failures. Athletes have a term for this: they call it the ‘lucky bounce.’ The link between luck and optimism has been explored in positive humanities (Tay & Pawelski, 2022), the study of the relationship between the arts and humanities, and human flourishing. Angus Fletcher (2023) argues, in a story world where the good luck of the main character is *personal, global, and stable*, hope and optimism are promoted. In the same way, optimism can be preserved if sporting successes can be attributed to an athlete’s own ability, is long-lasting, and also impacts other areas of life, while sporting failures can be attributed to a stroke of bad luck, or the ‘unlucky bounce,’ and is temporary. This emphasis is helpful in lessening the pressure on the athlete, and promoting failure attribution away from one’s own talent, or ability, and towards effort and practice.

Coaches as Role Models

The role of sports coaches in the development of optimism in athletes is paramount. In the basketball shooting research cited above (Miserandino, 1998), the coaches play a critical role in attribution retraining, by providing the appropriate instructions that promote an optimistic mindset. Sports coaches act as role models for young athletes, and they can learn optimistic beliefs, attitudes, and behaviors, through observational learning or vicarious learning (Southwick & Charney, 2018). The novice golf putting study, administered by Rasclé et al. (2008), demonstrated that a single functional (i.e., internal, controllable, and unstable) or dysfunctional attributional feedback, provided by the coach can modify people’s causal attributions and success expectancies. Attributional feedback was associated with free-practice behavior,

increasing interest in the activity (putting), and a key mediator of performance (Rasclé et al., 2008). Connaughton et al. (2008) reported examples from their sample of elite athletes, learning to rationalize their thoughts and feelings, and persevere in the face of unexpected, uncontrollable events, through social support figures, such as coaches and parents. Compared to workshop trainers, sports coaches can provide more effective support for athletes in a psychological skills training program (like PRP), as they are more likely to have a greater, intimate understanding of an athlete's thinking patterns, and can provide timely correctional feedback in a sport setting.

Green Exercise

Green exercise is defined as a physical activity that is performed in a natural environment, such as hiking or surfing (Pretty et al., 2005). A RCT with 42 subjects comparing three-hour outdoor mountain hiking and indoor treadmill condition, showed significantly greater positive effects on affect (mood), activation, and lower fatigue, suggesting that being outdoors has additive psychological benefits (Niedermeier, 2017). A novel 'walk and talk' coaching program over 12-18 weeks (a walk every 3-4 weeks), utilizes the outdoor natural setting to enhance therapy efficacy (van den Berg & Beute, 2021). Forty participants with burnout and stress related complaints, were randomized into the 'walk and talk' program, or a passive control group. The experiment group showed improvements over time for burnout, distress, social functioning, self-esteem, mindfulness, and importantly, hope. Qualitative comments from participants were generally positive, and predominantly related to gaining better self-awareness, and becoming more optimistic about the future (van den Berg & Beute, 2021).

Sport-based interventions to increase optimism

The first proposed sport-based intervention is aimed at increasing optimism, by combining cognitive restructuring, using Seligman's (2006) ABCDE model, with outdoor

hiking. While classroom-based cognitive restructuring training programs, such as the PRP, have helped children and adolescents challenge their distorted thinking patterns, and build a more optimistic mindset (Brunwasser et al., 2009), they haven't been tested in an outdoor setting. A small-scale study in Austria, found that mountain hiking provides an effective means of reducing hopelessness, depression, and suicide ideation, when compared to a control group, in patients with high-level suicide risk, and has suggested hiking as an add-on therapy to usual care (Sturm, 2012). Gillen (2003) pointed to the shared qualities of hiking – a form of adventure therapy (Russell, 2000) – and CBT; they work by transforming distorted thinking patterns, a focus on current and future functioning, and using physical and mental stress as a part of the change process. This intervention should be conducted in a one-on-one setting, between a guide – the counselor – and the client, and the difficulty of the hiking trail should be appropriately adjusted to the physical conditions of the client. Physically demanding and stressful situations, support growth and trust-building, between the guide and the client (Russell, 2000).

The cadence of a typical hike follows an uphill, ascending phase and a downhill, descending phase. It is suggested that prior to and during the ascending portion of the hike, an adverse event is discussed, and the client is taught the connection between cognition, emotions, and behavior (i.e., the ABC; how our thoughts influence our feelings and behavior). At the mountain peak, and during the descending portion of the hike, more accurate and positive thinking patterns (such as an unstable, local, and external explanation of negative events) are discussed and promoted, to replace previously negative thinking patterns. Being in nature, the outdoor and green environment, fosters positive affect (Pretty et al., 2005), a sense of awe (Anderson, 2018), and promotes mindfulness and reduces rumination (Mutz & Müller, 2016), that can facilitate a more open and engaged mind for the change process.

The second proposed sport-based intervention is aimed at increasing optimism, that is designed for a team sport setting. After a team loss, team members are led by the team coach to the “Best Possible Team” exercise. The “Best Possible Team” intervention involves collaboratively imagining the best possible team in various future timeframes (i.e., six months, one-, and two-years). The coach may ask team members to visualize a future for the team, in which everything has turned out the way the team has wanted, in areas of competition achievements, friendships formed, etc. Everyone has tried their best, worked hard, and achieved all the goals. On a whiteboard, write down what the team has imagined. The team is also encouraged to think of a professional team or elite athletes, that they aspire to, and want to become. The “Best Possible Team” intervention builds team resilience and can help individual team members develop an optimistic mindset.

Optimism is an important construct in positive psychology that has the potential for far-reaching benefits for psychological well-being and physical health. Sports provide a unique environment for teaching the skills of optimism, as they offer numerous, routinized opportunities, to cope with setbacks and adversity, enable real-time correction of maladaptive thinking styles, and provide a context where coaches and the nature, can play a vital role in fostering optimism. More research is needed to further explore the effectiveness of various sports and intervention strategies for increasing optimism. While optimism equips young people with a better mindset to navigate the future, the next chapter focuses on a skill that can help young people live in the present moment: mindfulness.

Chapter 5: Can Mindfulness be Taught Through Sport?

"Empty your mind."

- Bruce Lee

Bruce Lee was way ahead of his game. Decades before the first Ultimate Fighting Championship (UFC) event, he was already practicing mixed martial arts (Lee, 1975). Bruce Lee majored in philosophy, and was incorporating Eastern practices, like Zen meditation, into his combative repertoire (Lee, 1975). In that way, he was a true modern martial artist. He believed in the union of the body and the mind. With this belief, he trained his mind as intensely as he trained his body. In martial arts, Bruce Lee encouraged others to maintain a state of ‘choiceless awareness’ and be fully present in the moment with a non-judgmental attitude. He practiced sitting and moving meditations to cultivate such mindfulness. Inspired by his philosophy, the following chapter reviews the latest science on mindfulness and movement for well-being.

First, I will define mindfulness and outline its benefits. The interest in the application of mindfulness in sports has also grown in recent years. I will then discuss the relationship between mindfulness and flow, and whether mindfulness and flow states give athletes an edge in sports performance. Finally, I will propose a sport-based intervention to develop mindfulness using a combative sport (boxing). This chapter aims to address whether sport is a good channel to teach mindfulness.

As defined by Jon Kabat-Zinn, mindfulness is described as the moment-to-moment awareness, that is cultivated by purposefully paying attention to the present experience with a non-judgmental attitude (Kabat-Zinn, 1990). In other words, mindfulness is the awareness of

one's thoughts, emotions, and behaviors, in the present moment. Being mindful is not ruminating in the past, or prospecting into the future. Academic and clinical interest in mindfulness has significantly grown in recent years (Brown et al., 2007), including a recognition of the benefits of mindfulness for children and adolescents (Burke, 2010). A literature review of thirty life skills for young people, concluded that mindfulness was at the top of the list, with the highest aggregate score, according to three criteria: measurability, malleability, and meaningfulness (the association with desirable consequential life outcomes) (McGrath & Adler, 2022).

Benefits of mindfulness

Mindfulness is associated with greater mental health (e.g., lower depressive symptoms and anxiety) (Hofmann & Gómez, 2017), higher levels of subjective well-being (Brown & Ryan, 2003), greater physical health outcomes (Grossman et al., 2004), flow states (Kee & Wang, 2008), better attention (Jha et al., 2007), and lower stress reactivity (Pascoe et al., 2017b). Below, I will expand on the empirical relationship between mindfulness and improved mental health, reduced stress biomarkers, and increased flow states.

Anxiety and Depression

A large body of research has been dedicated to investigating the effects of mindfulness interventions in reducing distress, anxiety, and depression, in clinical and non-clinical populations (Biegel et al., 2009; Khoury et al., 2013; Khoury et al., 2015). A meta-analysis in 2013 examined the effects of 209 RCTs of mindfulness-based therapy, among 12,145 patients, with a variety of health disorders, including depression, anxiety, substance use, physical (e.g., pain) or medical conditions (e.g., cancer) (Khoury et al., 2013). Mindfulness-based therapies, such as Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) with established protocol, have a medium-to-large effect size in reducing

psychological and medical symptom severity, against the active control, and are especially effective for treating anxiety, depression, and stress (Khoury et al., 2013).

In one of these RCTs, Jain and colleagues (2007) compared the effects of a mindfulness-based intervention and somatic relaxation training, among 83 university students reporting distress. The somatic relaxation training consists of progressive muscle relaxation, simple breathing techniques, and guided imagery for relaxation. Both mindfulness meditation and somatic relaxation led to a significant reduction in distress (i.e., large effect size), as well as an increase in positive moods, compared to the control group (Jain et al., 2007). A potential unique mechanism of action for mindfulness training, the authors noted, is the ability to decrease rumination and distractive thoughts (more so than somatic training), by promoting objectivity and nonreactivity (Jain et al., 2007). There are many roads to mindfulness, including somatic techniques which are more prevalent in sports (Xia et al., 2019).

Physiological Markers of Stress

Cognition is only one pathway to reduced distress. Meditation practice leads to decreased physiological markers of stress. A meta-analysis study reviewing 45 randomized control trials, found that meditation interventions reduced cortisol, systolic blood pressure, and heart rate (Pascoe et al., 2017b). Akin to physical activity, mindfulness helps booster the vagal brake, and regulates the PNS, to bring a sense of calm and relaxation. In the athletics domain, a meta-analysis of 23 RCTs and 899 participants examined a range of stress regulation interventions and their impact on sports performance (Murdoch et al., 2021). Consistent with other research findings, they found a significant large effect of mindfulness interventions on the physiological outcomes of athletes (e.g., HRV, salivary cortisol, and respiration rate), but a null effect on improving sports performance (Murdoch et al., 2021). Other stress regulation interventions, like

biofeedback (visual or auditory cues for physical and psychological stress) and multimodal interventions, have better success at influencing sports performance (Murdoch et al., 2021). In sum, mindfulness reduces our biological stress biomarkers, which in turn reduces our psychological distress, but has not been shown to improve sports performance.

Flow States

Several studies have investigated the relationship between mindfulness and flow states (Aherne et al., 2011; Cathcart et al., 2014). Csikszentmihalyi (1990) described the state of flow, or ‘optimal experience’, in his seminal work: *Flow: The Psychology of Optimal Experience*. Flow is described as an elusive enjoyable experience, that feels effortless and emotionless, with a distorted sense of time. People in sports call it ‘in the zone’. Flow can be replicable in sports under the right conditions: when there is a clear goal, and the challenge of the situation matches our skills (i.e., we are neither too bored nor too challenged, by the situation), it produces feelings that our action is spontaneous and automatic (Csikszentmihalyi, 1990). A qualitative investigation of elite athletes, reveals the flow experience during sports, characterized by the autotelic experience of flow (sports done for its own sake), total concentration, the merging of action and awareness, and the feeling in control of the situation without the need to exert effort (the paradox of control) (Jackson, 1996). During flow states, we are so absorbed in the activity, that negative thoughts, everyday concerns, and anxieties, are drowned out, and there is a loss of self-consciousness momentarily (Csikszentmihalyi, 1990). The quality of the flow experience shares many similarities with the meditative experience.

Mindfulness, in many ways, is an antecedent to entering flow states. A study with 182 university students, found a strong correlation between dispositional flow and self-reported mindfulness, mediated by mental skill adoption (Kee & Wang, 2008). The authors noted that the

mindfulness of flow in itself is necessary for experiencing flow, and that instead of striving for flow, it is more appropriate to develop mindfulness (Kee & Wang, 2008). A small-scale experimental study involving 13 university athletes (randomly assigned to experimental ($n = 6$) or control ($n = 7$) condition), found that athletes who underwent mindfulness training, reported a large increase in global flow scores post-intervention (Aherne et al., 2011). A subsequent, multi-sport, correlational study of 92 elite athletes by Cathcart and colleagues (2014), showed a stronger correlation between mindfulness and flow in athletes, from individual and pacing sports, compared with team-based and non-pacing sports. It is suggested that the internal focus (e.g., observing, nonjudging, and non-reacting) of mindfulness, may have more relevance and influence on flow in individual pacing athletes (Cathcart et al., 2014).

Flow in adventure sports has been investigated in a systematic review and thematic synthesis, involving 1,179 participants, in rock-climbing, surfing, mountaineering, kayaking, and skydiving, across 20 eligible studies (Boudreau, 2020). The researchers highlighted that moderate-to-extreme challenge, was found to be a key antecedent of flow among adventure seekers (regardless of participants' skill level), and flow states were correlated with the reduced perceived risk, a heightened sense of control of the environment, and immersion in nature (Boudreau, 2020). This highlights the relevance of the presence of risk, and the desire for control, when inducing flow states. The well-being outcomes after flow experiences are described as positive emotions, enjoyment, transcendence, and self-fulfillment (Boudreau, 2020). Although there is a strong theoretical overlap between the concepts of mindfulness and flow, the low quality of these empirical studies warrants more future research validating these claims.

Interventions for increasing mindfulness

Encouragingly, mindfulness can be changed through intentional practices. A meta-analysis of 29 RCTs, with a total of over 2,600 participants, found that mindfulness is malleable through mindfulness interventions with healthy individuals (Khoury et al., 2015). Most people view mindfulness interventions (such as meditation) as a cognitive endeavor. This chapter shows that mindfulness can also be developed through movement (such as yoga asanas, flow states during sports, and walking meditations). Xia and colleagues (2019), reviewed 69 studies, comprised of 4,690 participants with physical or psychosocial interventions not explicitly labeled as mindfulness-based interventions, and found that almost half of them showed at least a small effect for increasing mindfulness. Many of these interventions were mind-body practices, that directed attention to the body, breath, or movement. Moreover, regular exercises that are not considered mind-body practices, such as aerobics, wilderness hikes, and tango, were also associated with increased mindfulness (Xia et al., 2019). So long as participants can maintain a ‘moment-to-moment awareness’ of one’s thoughts, emotions, and behaviors, during physical activity or sports, mindfulness can be cultivated.

Yoga Asanas

Today, yoga is one of the most frequently practiced mind-body interventions, to cope with stress, and improve physical health and mental well-being. The practice of yoga is more than 5,000 years old and has its roots in Indian philosophy. The goal of traditional yoga has been described as uniting the mind, body, and spirit (Pascoe et al., 2017a). The three distinct components of yoga are physical postures (asanas), breathing techniques (pranayama), and meditation (dyana) (Pascoe et al., 2017a). During yoga, the practitioner focuses his mind on the postures (i.e., asanas), with inner awareness and a meditative focus of the mind. Yoga and the

flow activities described in Csikszentmihalyi's (1990) book share a common goal, which is to achieve control over what happens in the mind. He calls yoga 'one of the oldest, and most systematic methods of producing the flow experience' (Csikszentmihalyi, 1990, p.106). The practice of yoga asanas (i.e., yoga poses), is part of a wider program in mindfulness-based stress reduction (MBSR), developed by Jon Kabat-Zinn (Pascoe et al., 2017a). A study with 46 participants, found an eight-week hatha yoga intervention, to significantly increase trait mindfulness, and suggested using yoga as a preventive method, for the later development of negative emotional mood states (Shelov, 2009). A meta-analysis of 42 RCTs, found yoga asanas were associated with many stress-related biomarkers. Mindful physical activity, such as yoga, may decrease stress reactivity, through the regulation of the sympathetic nervous system as effectively as other mindfulness-based interventions.

One simple posture that can be easily integrated into any sport or physical activity is the savasana pose, for relaxation, recovery and becoming more mindful. To enter savasana, the individual lies face-up on the ground, with legs comfortably spread, and arms relaxed alongside the body, palms facing up. The body is in this neutral position for a minimum of five minutes. During this time, participants can practice 'box breathing': starting by breathing in through the nose to the count of four, feeling the air enter the lungs; holding the breath for another count of four; then slowly exhaling through the mouth for 4 seconds; at the end of the slow exhale, hold the breath for another 4 seconds, before starting the whole breath cycle again. The box breathing is a simple relaxation technique, that aims to return breathing to its normal rhythm after a stressful experience.

Mindful Sport Performance Enhancement (MSPE)

Several programs have been developed specifically to help athletes become more mindful. One such program, Mindful Sport Performance Enhancement (MSPE), aims to promote flow states through mindfulness training, and has been tested empirically in long-distance running, archery, and golf (Kaufman, 2009; De Petrillo et al., 2009). The program is a four-week mindfulness program integrating elements from MBSR, including body scan, sitting meditation, mindful yoga, and walking meditation, along with some sport-specific mindful movements catered to archers and golfers (Kaufman, 2009). The mindfulness training resulted in an increase in trait mindfulness for archers; an increased ability to describe observed phenomena for golfers (a subcomponent for trait mindfulness); and an increase in both state and trait mindfulness, and a decrease in sport-related worries, for long-distance runners (Kaufman, 2009; De Petrillo et al., 2009). When measured, MSPE increased dispositional and state flow for archers and golfers (Kaufman et al., 2009). A sport-specific mindfulness program, like MSPE, showed promising results in improving mindfulness and flow states in athletes, but there is a lack of evidence on improving sports performance (Kaufman, 2009; De Petrillo et al., 2009; Thompson et al., 2011). The skill of mindfulness takes time to develop, and a shortened program (from eight-four weeks) may not be enough to build a lifelong habit, nevertheless, these results are encouraging.

Why is sport a good avenue to teach mindfulness?

Body Awareness

Body awareness and sensing are critical elements of any athletic endeavor. Bringing awareness to physical sensations using the body scan, and balancing practices during sports, enhances proprioception – defined as ‘the sense that lets us perceive the location, movement, and action of parts of the body’ (Taylor, 2009). For example, in martial arts, an accurate judgment of

the distance between you and your opponent (i.e., body awareness), can keep you in and out of the striking zone. In wake surfing, the balance and shifting of weight between the front and back foot (i.e., body sensing), helps the surfer accelerate and deaccelerate. Mindful moving practices like yoga take advantage of the attention to, and awareness of, internal body sensations (as well as thoughts and feelings) to cultivate mindfulness. Mindfulness practices help patients focus on the ‘sensory components’ of their physical pain, and to reduce their subjective pain (Burns, 2006). Brani and colleagues (2014) carried out a study on body awareness and mindfulness, and found that both constructs are highly correlated, and have predictive relationships with subjective well-being. A meta-analysis of 15 RCTs of 879 subjects, found a small effect linking mindfulness with greater body awareness accuracy, using objective measures, such as heartbeat tracking or proprioceptive signals (Treves et al., 2009). Hefferon (2015) suggested that positive psychology intervention should contain somatic and visceral components, that will encourage a better understanding and appreciation of the body. Cultivating a more positive body image, from appreciating, respecting, celebrating, and honoring the body, leads to higher levels of psychological and social well-being (Hefferon, 2015). An awareness of, and responsiveness to, bodily sensations during sports offers a starting point to direct our attention to cultivate mindfulness.

Dynamic Environment and the Need for Concentration

Csikszentmihalyi (1990) posited that the challenges of the activity are what force us to concentrate. Sports that require the athlete to interact with a constantly changing external environment promote mindfulness. The changing condition becomes a focal point of attention and demands intense concentration. For example, a surfer needs to have a good awareness of the changing ocean conditions; and a basketballer needs to ‘get his head in the game’ and pay

attention to the unfolding action on the court involving nine other players. Such concentration and the constant feedback on measuring progress against set goals, can lead to flow states (Csikszentmihalyi, 1990). During game time, there is little room to think or ruminate about anything else. Becoming mindful is the antecedent to the successful navigation of such dynamic environments.

Nervous Systems Optimization and Physical Pain

Sports played at a high intensity can trigger the ‘fight-or-flight’ stress response. Vagal brake is the ability to activate the PNS and return the body to a state of calm and relaxation. The physical arousal of physical activity offers plenty of opportunities to train the vagal brake. The ability to recover quickly during competition also gives athletes an edge. In endurance sports like triathlon, physical pain endured can cause negative emotional states. The physical pain and emotions are leveraged as a subject for awareness and attention, during moving mindfulness practice. In meditation, instructions are given to simply observe our negative emotions, and learn to disassociate our negative thoughts and feelings, from the self (Kabat-Zinn, 1990). Long-distance runners have reported directing attention to internal somatic sensations, even painful ones, as an anchor, to become more mindful and enter flow states (Csikszentmihalyi et al., 2017).

Intrinsic Motivation (Autotelic Activity)

Csikszentmihalyi (1990) studied why people invested huge amounts of time and energy in activities appearing to yield limited external rewards. Athletes, including rock climbers, dancers, and basketball players, partake in their activity for their own sake; Csikszentmihalyi called them ‘autotelic’ activities (meaning ‘self-goal’ or ‘self-purpose’). School-aged children are usually intrinsically motivated to play sports, particularly in a group social context. A moving mindfulness practice may help address the struggles of many novice meditators, keeping up with

a regular sitting meditation practice, due to long practices, emerging negative thoughts, and becoming self-critical (Banerjee et al., 2017). To overcome barriers that may interfere with practicing over time, it is important that the activity is enjoyable and ‘autotelic’. For those who find it difficult to sit and meditate (and, arguably, can benefit even more from becoming mindful), a moving meditation practice may improve stickiness.

Sport-based interventions to increase mindfulness

The proposed intervention - “mindful boxing” - teaches mindfulness, so participants learn to respond to external stimuli with conscious awareness, rather than to react without conscious awareness. It aims to train the awareness of thoughts, feelings, and behaviors, during physical activity. Novice boxers will pair up and take part in a drill to withstand 30 seconds of free flow punching from a partner, whilst holding a guard position. Each participant will be instructed on how to hold a guard position properly, and to protect themselves. During the 30 seconds, the person holding the guard position will learn to observe their thoughts (“what’s going through my mind right now?”), emotions (“can you label the emotions that are arising?”), and behavior (“is my body tightening up? Am I maintaining my balance?”). The punching partner is encouraged to become fully aware of his/her punches (e.g., how/where are they landing? What are the bodily sensations on the knuckles and arms?) and become aware of the way he/she is breathing (noticing the pace, depth, and the source - nose or mouth). In each pair, participants will swap roles after the initial round. As the rounds proceed, and the intensity of the exercise increases, participants are asked to maintain their ability to be mindful of their thoughts, feelings, and actions. The exercise can last six to eight rounds, depending on the participant’s level of fitness. To recover, all participants will take the savasana (corpse) position for three minutes, to cool down and become mindful of one’s own breathing. This intervention requires the participants to

develop body awareness, *respond* to a dynamic situation under distress, and become aware of any thoughts and feelings that arise. This type of mindful boxing can also be applied to a more dynamic light sparring session, once participants have learned basic combat skills.

This chapter explored whether sports is a good channel to teach mindfulness. Mindfulness improves our mental health, enhances physical stress-related biomarkers, and helps us enter flow states whilst playing sports. Sport is a unique place to teach mindfulness; it can be cultivated through sitting meditations, mindful movements, or even regular physical exercises. The proposed intervention incorporates mindfulness and boxing, emphasizing the dynamic nature of the sport, and paying more attention to our body sensations, breathing, thoughts, and emotions. Research has shown that mindfulness-based interventions also increase empathy, the focus of the next chapter, through paying more attention to the thoughts and feelings of the self and others (Cheang et al., 2019).

Chapter 6: Can Empathy be Taught Through Sport?

“Relationships with people are what it’s all about. You have to make players realize you care about them. And they have to care about each other and be interested in each other. Then they start to feel a responsibility toward each other.”

- Gregg Popovich (Head coach, San Antonio Spurs)

Empathy is the capacity to share and understand others’ internal states (Weisz & Zaki, 2017). There are two components to empathy: cognitive empathy (the ability to comprehend the emotions of another person), and affective empathy (the ability to experience the emotions of another person) (Jolliffe & Farrington, 2006). Affective empathy includes sharing similar

emotions (emotional contagion) or feeling sorrow or concern for the observed other (empathic concern). Individuals with a better understanding of others' emotions are likely to also experience more shared feelings or empathic concern (Jolliffe & Farrington, 2006). Importantly, empathy involves sharing and understanding a range of emotions, both positive and negative. A literature review of 30 life skills for young people ranked empathy as the second most important skill, after mindfulness, using the criteria of measurability, malleability, and meaningfulness (McGrath & Adler, 2022).

Parents or caretakers can have a strong influence over a child's development of empathy. Attachment theory posited that children who are securely attached to their attachment figures, feel safe to explore and develop the essential skills for adult life (Ainsworth et al., 2015). When supportive and warm parent(s) satisfies children's emotional needs, the children are less preoccupied with their own emotions, and therefore have a better ability to attend to the other person's emotions (Ainsworth et al., 2015). A strong parent-child relationship enables the socialization of empathy, through the modeling of warm and supportive behavior (Eisenberg et al., 2003). When teenagers reach adolescence, peer relationships are prioritized. A meta-analysis of 70 eligible studies, involving over 20,000 subjects, found a stronger correlation between empathy with peer relationship quality, than with parent-child relationship quality during adolescence (Boele et al., 2019).

The ability of stress to shut down empathy has been investigated in mice and human models. A study found that when stress level rises between stranger dyads, it directly impacts the ability to display emotion contagion, or the ability to feel others' pain (Martin et al., 2015). Reducing stress, either through pharmacological or psychological methods, elicits emotional

contagion even among stranger dyads (Martin et al., 2015). Given that physical activity is a form of micro-stress, the influence of stress in cultivating empathy needs to be considered.

Benefits of empathy

Empathy is empirically related to children's prosocial behavior, higher quality of peer relationships, lower levels of aggression, and antisocial behavior (Spinrad & Eisenberg, 2014).

Prosocial Behavior

Prosocial behavior is defined as positive behavior intended to benefit others (Yin & Wang, 2023). Everyday examples include offering a seat to elders, consoling a friend who's feeling sad, or donating to charity. People with high levels of empathy are more able to comprehend and feel the emotions of other people, making them more willing to feel empathic concern for others, and help others alleviate their suffering (Eisenberg et al., 2003). A recent meta-analysis provides robust empirical evidence, to show that empathy is an important prerequisite for prosocial behavior, with a medium effect size (Yin & Wang, 2023). The review covered 62 studies and 146 samples, with 71,310 participants (Yin & Wang, 2023). The study found that prosocial behavior is associated with less problematic peer relationships in early adolescence, and greater success in academic and social relationships (Yin & Wang, 2023). Prosociality also improves subjective well-being. Multi-country correlational studies and experimental studies consistently show that prosocial spending (using financial resources to help others) leads to greater happiness in different cultural contexts (Aknin et al., 2013). A six-week randomized experimental study with 218 participants, shows that performing kind acts led to greater improvements in well-being in undergraduate students (studying in the US and in South Korea), and that autonomy support for positive behavior change (i.e., supported by others to

freely choose their kind acts), facilitated an even larger increase in well-being (Nelson et al., 2014).

Social Connection

Empathy is a social bridge that allows us to connect with one another: helping others is a sure way to make friends. Empathy is empirically shown to be associated with children's and adolescents' positive social functioning (Murphy et al., 1999). A longitudinal study found that teacher-rated empathy reports in six year olds, were positively related to the social competence of these children at eight, 10, and 12 years old (Murphy et al., 1999). The bidirectional of empathy and peer relationships should be noted. Empathetic children tend to be more popular and have supportive peer relationships. More time spent with peers, in turn, helps children develop more concern for, and understanding of, others' emotions (Boele et al., 2019).

Relationship is the most common thread across well-being models (Seligman, 2011; Prilleltensky et al., 2015). Research shows that one of the most consistent predictors of subjective well-being is the quality of our social relationships (Diener & Seligman, 2002), and highlights the importance of developing empathy from a start age.

Reducing Bullying and Aggressive Behavior

Empathy is widely seen as an important trait for humans to care for, and avoid harming, others. The development of empathy is especially important for early adolescence, between the age of 11 and 13, when bullying was most frequently remembered to occur (Eslea & Rees, 2001). The higher ability to share and understand others' emotions is related to less aggressive behavior toward others (Spinrad & Eisenberg, 2014), and better conflict resolution among peers (de Wied et al., 2007). A study with 318 adolescents found that boys with low levels of empathy were associated with students' involvement in bullying others (Gini et al., 2007). However,

empathy did not predict girls' bullying behavior. Unsurprisingly, empathy was positively associated with actively helping victimized schoolmates (Gini et al., 2007). The 'contact hypothesis' suggests that interpersonal contact between groups can build empathy and reduce prejudice. Sports are known for building social cohesion among different groups. An experimental study in post-war Iraq randomly assigned Iraqi Christians to an all-Christian soccer team (control), or to a team mixed with three Muslims (the intervention), over a two-month soccer season (Mousa, 2020). Christians in the experiment group were more likely to display anti-discriminatory behaviors post-intervention (e.g., voting for a Muslim, registering for a mixed team in the future, and training with Muslims) (Mousa, 2020). In summary, empathy is a foundational skill for improving the quality of social relationships, increasing prosocial behavior, reducing aggressive behavior, and enhancing intergroup relations. These are all pathways to greater well-being.

Interventions for increasing empathy

Empathy is malleable, through interventions that target cognitive and affective empathy (Teding van Berkhout & Malouff, 2016; Chan et al., 2021). A meta-analysis that included 18 RCTs of empathy training, with a total of 1,018 participants, shows promising results (i.e., medium effect size) (Teding van Berkhout & Malouff, 2016). The variety of interventions shows that there are many paths to developing empathy in school-aged children, including experiential learning programs, SEL programs, role-playing, music and literature, and service-learning projects. A review of 20 randomized control studies, shows experiential learning programs, with a combination of reflection, feedback, discussion, and debriefing elements, yield better efficacy in the improvement of empathy and well-being, compared to non-experiential learning programs (Chan et al., 2021).

Empathy training can be broadly categorized into: 1) experiential-based, 2) expression-based, and 3) motivation-based (Weiz & Zaki, 2017). Experiential-based interventions emphasize taking the other person's perspective by imagining themselves in someone's position ("what would that person think?") or considering the other's internal states ("how would that person feel?"). Role-playing and audio-visual aid (for example, watching a documentary about an unknown group of hunter-gatherers), are common techniques in experiential-based interventions, to 'step into someone else's shoes' and emphasize perspective-taking.

Expression-based interventions teach participants to recognize targets' internal states, and respond appropriately (Weiz & Zaki, 2017). Emotion recognition (i.e., reading facial or body cues for emotional states) and communication training are typical expression-based interventions. For example, an active constructive response (ACR), is a communication technique that capitalizes on another person's positive news and emotions, and responds with enthusiastic support (Gable et al., 2006). Research shows how we respond to others sharing good news is a better predictor of relationship well-being than social support when bad news is shared (Gable et al., 2006). Troubled adolescents with an impaired ability to recognize emotions in others benefitted most from emotion recognition training, which resulted in significant improvements in affective empathy in a RCT (Dadds et al., 2012).

Weiz and Zaki (2017) argue that experiential-based and expression-based interventions address one's ability to empathize, but inadvertently discount one's motivation to empathize. Motivational-based interventions target situations where subjects are unwilling to empathize (Weiz & Zaki, 2017). People are reluctant to empathize when it conflicts with their goals, for instance, during sports competitions. A lack of motivation, rather than a lack of ability, to empathize is particularly pertinent in school bullying. A recent study examined the effects of a

motive-based intervention, with 292 college freshmen, during the first two academic quarters (Weisz et al., 2021). In the experiment group, over three one-hour sessions, participants were asked to write two letters to separate high school freshmen that were having difficulty adjusting socially to their new school, and then write a speech. The first letter was about the malleable nature of empathy and were told that imparting this message can help the high school students overcome their social challenges. Before writing the letters, they were presented with research about the malleability of empathy, and that empathy can be developed with effort (Weisz et al., 2021). The second letter was about a situation in their own lives where they had difficulties empathizing with someone and had to describe how they overcame that challenge. Later, participants turned the two letters into a speech, and recorded it on video. Eight weeks later, experiment group participants endorsed stronger beliefs about empathy's malleability, exhibited greater empathic accuracy when rating others' positive emotions, and reported having made a larger number of friends at the end of first year of college, compared to the control conditions (Weisz et al., 2021).

Positive Humanities

Tay and Paweiski (2022) posit that empathy and social skills can be acquired through engagement with humanities. Music and literature are useful experiential-based interventions for empathy. For example, fiction (in novels or movies) gives us the rare opportunity to immerse ourselves in another person's (character's) perspective, including their emotions, beliefs, and behavior through narrative transportation (Fitzgerald & Green, 2022). Narrative transportation is the experience of "losing oneself" in the world of the story, and essentially experiencing the story narrative as though it is your own experience (Fitzgerald & Green, 2022). Such immersion experiences help people develop empathy and perspective-taking, leading to greater social skills

and better social connections (Fitzgerald & Green, 2022). With the advances in virtual reality and AI generative content, emerging technologies can further enhance the use of narrative transportation, to facilitate empathy training. Narratives involving elite athlete role models may resonate well with school-aged community sport athletes.

Music is a particularly effective medium for conveying emotions, and can be used to build bridges with people from other cultures, and foster empathy (Coopersmith, 2019). In an empirical study, researchers tested the ability of music listening, in reducing prejudice against, and increasing affiliation with, another culture (Clarke, DeNora, & Vuoskoski, 2015). Sixty-one adult participants were randomly assigned to listen to Indian music or West African music, where the lyrics were unfamiliar to the participants. The study found that empathic individuals had a stronger association between positive words and West African faces, after listening to West African music, and a stronger association between positive words and Indian faces, after listening to Indian music (Clarke, DeNora, & Vuoskoski, 2015). With the right music, individuals can lose themselves in a group for self-transcendence experiences (Haidt, 2012). Social psychologist Jonathan Haidt calls this ability the *hive switch* (Haidt, 2012), and highlights the ability of music to elicit such collective effervescence, the feeling of energy and harmony, when people, even strangers, are simultaneously communicating the same thought, and participating in the same action (Durkheim, 1915). According to Haidt (2012), music facilitates movement synchronicity in a group, which in turn, builds trust among members within the group. In a collective setting, music experiences, such as an intimate concert, a gospel choir, or singing in a football match, can transcend personal and cultural barriers, and increase empathy and collective belonging. The incorporation of music and narratives in a sporting context can help young athletes improve social and empathy skills and build positive peer relationships.

Mindfulness-Based Intervention

Mindfulness is focusing on the present moment in a non-judgmental manner (Kabat-Zinn, 1990). Some research suggests that mindfulness can increase empathy, as it encourages people to observe their own emotions, which may help them better understand and empathize with the emotions of other people. A meta-analysis of 16 studies, with 2,084 participants between five and 18 years old, found convincing support that mindfulness-based interventions, can increase empathy and compassion in children and adolescents (Cheang et al., 2019). Although the mechanism of change for mindfulness and empathy is unclear (Cheang et al., 2019), sport-based interventions incorporating both mindfulness and empathy elements may have mutually beneficial results.

Why is sport a good avenue to teach empathy?

People who participate in sports already have higher levels of cognitive empathy, and this is not exclusive to team sports (Shima et al., 2021). A correlational study of 504 college students participating in a range of individual and team sports, found both individual sport and team sports athletes to have higher cognitive empathy than non-athletes (Shima et al., 2021). Affective empathy was not related to sport participation. A systematic review found that improved social skill is a key outcome of participation in sports (Eime et al., 2013). One large-scale correlation study involving 25,797 children between the age of six to 11 (middle school), found that children who participated in both sports and clubs had higher social competence, compared with their peers who did not participate in outside-of-school sporting activities (Howie, 2010). The understanding of underlying mechanisms (i.e., the influence of empathy) is limited in correlational studies.

Teamwork, Team Cohesion and Working Towards a Common Goal

There is a natural connection between empathy and sports team performance. Athletic endeavors, especially in team sports, require individuals to predict unfolding events on the sporting field, recognize others' (teammates and opponents) intentions, and adapt one's own actions to others' actions (Sevdalis & Raab, 2014). Team sports require individuals to work together towards a common goal. This shared mission requires athletes to work together as a team, and to understand and predict their teammates' actions, motivations, and emotions.

Team cohesion results in better team performance (Carron et al., 2002). Research shows that empathic concern was positively associated with cooperative behaviors in sports teams (Guivernau & Duda, 2002). In a study with 241 curlers from 69 teams participating in a curling league competition, empathy and team cohesion predicted competition performance, and athletes' communication skills fully mediate this relationship (Bedir et al., 2023). Sports teams, like any other effective group functioning, require respectful engagement and trust between teammates, both of which are relevant to the basic human need to *matter*, defined as *feeling valued* and *adding value* (Prilleltensky, 2020). *Mattering* can only happen when one's thoughts and feelings are understood and felt by others, and where empathy is expressed appropriately. For example, if all team competition playing time goes exclusively to the starters (e.g., the 'starting five' in basketball), players in the second or third unit may not feel that they're adding value or feel valued. Strong team cohesion is the result of a 'we-culture', where everyone has the right and the responsibility to *feel valued* and *add value*, as opposed to a 'me-culture', where individuals each feel that only they have the right to feel valued (Prilleltensky, 2020). A 'we-culture' requires individual sacrifice for the common good, but it is always a delicate balance. As we have learned, empathy is also required to resolve and avoid team conflicts and lift each other

during difficult team losses. A competitive win-at-all-costs environment might not foster empathy as effectively as an environment where teamwork, mutual support, and understanding are prioritized.

An athlete's ability to handle pressure can also result in superior team performance. Laboratory experiments show that athletes with greater emotional awareness and regulation experienced a lower increase in stress when competition stress was artificially induced (Laborde et al., 2011). Teaching empathy in team sports can produce stronger team cohesion, which may lead to better team performance, and a more positive experience for all.

Oxytocin and Team Sports

Oxytocin is a hormone that regulates social interaction, maternal-infant bonding and aggression, toward non-kin, milk release, empathy, and anxiety (Yüksel et al., 2019). Experiments have shown that oxytocin, given to subjects via nasal sprays, enhances the subjects' potential to recognize faces, ability to identify emotions from facial cues (i.e., cognitive empathy), and willingness to part with money due to unfairness to another person (i.e., prosociality) (Bakermans-Kranenburg & Van Ijzendoorn, 2013). Oxytocin can be triggered by exercise (Ratey & Manning, 2014; Rassovsky et al., 2019). An experiment with mice shows that exercising releases oxytocin (in both brain and serum), and in turn promotes empathetic prosocial behavior (Yüksel et al., 2019). Interestingly, the study found that oxytocin levels post-exercise, were higher in the exercised female mice, but unchanged in male mice (Yüksel et al., 2019).

An exploratory review gives evidence on oxytocin playing a role in the biopsychological underpinnings of superior performance in team sports (Pepping & Timmermans, 2012). The authors argue that oxytocin encourages important team processes. Along with cognitive and

affective empathy, research has shown that oxytocin has effects on trust, generosity, reading body language, altruism, cooperation, emotion recognition, and gaze behavior (Pepping & Timmermans, 2012). In specific sports where athletes need to communicate across great distances, the ability to recognize emotional body expressions gives the athlete a competitive edge. In team sports, social interactions and emotions play a critical role, and oxytocin facilitates team processes and superior sports performances.

Sport-based interventions to increase empathy

The first intervention - "*in a teammate's sneakers*" - targets cognitive empathy, and the ability to see things from someone else's perspective. For perspective-taking, members of a basketball team will play the position of other players in the team (e.g., a Center will play the Point Guard position) during practice. Players will rotate through all other positions (i.e., Point Guard, Shooting Guard, Small Forward, Power Forward, and Center) over four sessions of basketball training. Teams will play 5v5 scrimmages, and individuals are told to pay attention to their playing experience in someone else's position. Team members are encouraged to share their experience at the end-of-practice debrief session, and complete reflective journaling exercises at home, on what they have learned playing in someone else's position. Through this exercise, participants develop a better understanding, of the on-court decision-making of their teammates, and adjust their own playing style for better teamwork and collective team success, making them become more all-rounded basketball players. An athlete that can play all positions, like LeBron James, tends to develop a higher basketball IQ. The intervention is expected to increase the cognitive empathy of individuals in the team. In the longer term, increased empathy is expected to improve social relationships and prosocial behavior.

A second intervention - “*strength-spotting*” – is designed for a team sport for young people. The activity is to identify the strengths of others as teammates. This can be both character strengths (e.g., kindness, perseverance, and social intelligence; Peterson & Seligman, 2004) or basketball-related skills. Knowing the strengths of teammates is critical for teamwork and working collaboratively as a team to win games. Players are encouraged to observe the skills of their teammates during practice and games, and actively listen for cues on what their teammates think they’re good at. Through observation and listening, participants will develop a greater sense of empathy for others. The expected outcome is to strengthen relationships within the basketball team, build team cohesion, and hopefully build social competence for everyday life outside of sports.

Through the identification of strengths within themselves and others, participants can improve their self-awareness, first in a basketball context, but also their character strengths (Peterson & Seligman, 2004). With the right guidance from a coach or team leaders, individuals can benefit from the social structure afforded in a team sport setting.

A third intervention – “*sports fiction movie nights*” – is intended to strengthen athlete’s cognitive and affective empathy, through perspective-taking. These movie nights can take place separately, outside of training and competition. Fictional stories can be used as teaching material, through narrative transportation, to demonstrate the inner world of an individual, with a unique window into their values, beliefs, and behavior. For instance, *Blind Side* (starring Sandra Bullock) is the uplifting true story of football star Michael Oher’s life (played by Quinton Aaron), and how he overcame his rough childhood, with the help of his adopted family. With the love and encouragement of his adopted family, he eventually succeeds academically, and made it to the NFL. The movie teaches kindness, compassion, and resilience. Fiction can act as a

jumping-off point to discuss the challenges young athletes may face. I encourage post-movie discussions about the characters, and reflections on what they have learned through other people's lived experiences.

Stories also provide fictional characters that embody the exemplary characteristics of a role model. Young people can imitate on-screen characters through observational learning. In the popular TV series *Ted Lasso*, the protagonist coach, Ted Lasso, is a character that exemplifies optimism, empathy, and kindness. Using Ted Lasso can be an effective tool, to teach optimism and pro-social behavior. The character's popularity and clever writing make it very relatable to a younger audience.

Sport is a natural environment to develop empathy. Empathy is a social bonding skill – it leads to prosocial behavior, greater social competence, and better conflict resolution capability. Besides the social interactions afford in a sports setting, oxytocin, released during exercise, is a potential mechanism for building empathy. Oxytocin improves our ability to recognize faces, identify emotions from facial cues and body gestures, and ultimately builds trust. To teach empathy through sport, I propose three interventions: position swap in a team sport setting, spotting teammates' strengths, and movie nights featuring inspirational sports fiction. Bringing all three skills (optimism, mindfulness, and empathy) together, a curriculum outline is presented in the next chapter focusing only on one sport: basketball.

Chapter 7: Artifact - Positive Physical Education Curriculum for Basketball

The following is an outline of a six-week curriculum based on basketball, that teaches optimism, mindfulness, and empathy (See Table 1). There is a combination of in-training sessions, classroom-based teaching, and a homework exercise. In-training sessions are designed to last between 15-20 minutes and are incorporated into a team's usual basketball training

sessions. The strength of this curriculum is the ability to weave into an existing basketball curriculum. Classroom-based teaching sessions are longer (approximately one-hour long), delivered in week two and week four, and are designed to cover the more theoretical side of positive psychology. During week five, there is a homework exercise that is a motivational-based intervention, to increase empathy. The total accumulated time required is four and a half hours.

Table 1

PPE Curriculum for Basketball

Six-Week Optimism-Empathy-Mindfulness Basketball Curriculum Outline						
Week/ Session	Target Skill	Sport Activity	Type	Duration	Intervention	Expected Outcome
1	Optimism	Shooting Practice	In-Training	15 mins	Attribution Retraining Attribute failure to the lack of effort, and success to personal ability (See Chapter 4).	Better shooting performance Increase resilience Increase overall well-being
1	Mindfulness	Warm Down	In-Training	5 mins	Savasana-Breathwork Box breathing, whilst resting in the savasana/corpse pose (See Chapter 5).	Flow state Reduce anxiety
2	Mindfulness	Shooting	In-Training	15 mins	Mindful Shooting Pay attention to thoughts, feelings, and sensations, when shooting the basketball (See Chapter 5).	Reduce anxiety
2	Mindfulness	Warm Up	In-Training	5 mins	Walking Meditation Close your eyes and pay attention to thoughts, feelings, and sensations, during slow walking (See Chapter 5).	Flow state Reduce anxiety
2	Optimism	Handling Losses	Classroom	1 hour	Cognitive Restructuring (ABCDE) Identify negative thinking patterns and replace them with more positive ones (See Chapter 4).	Increase resilience Increase overall well-being
3	Empathy (Experiential)	Scrimmage 5v5	In-Training	15 mins	Position Swap 5v5 Swap positions with another teammate during a 5v5 scrimmage, then reflect on the experience (See Chapter 6).	Improved relationship Prosocial behavior
3	Mindfulness	Warm Down	In-Training	5 mins	Savasana-Breathwork	Recovery Reduce anxiety

					Box breathing, whilst resting in the savasana/corpse pose (See Chapter 5).	
4	Mindfulness	Dribbling	In-Training	15 mins	Mindful Dribbling Pay attention to thoughts, feelings, and sensations, when dribbling the basketball (See Chapter 5).	Flow state Reduce anxiety
4	Mindfulness	Warm Up	In-Training	5 mins	Walking Meditation Close your eyes and pay attention to thoughts, feelings, and sensations, during slow walking (See Chapter 5).	Flow state Reduce anxiety
4	Empathy (expressive)	Celebrating Victories	Classroom	1 hour	Active Constructive Responding Learn to show enthusiastic support when others share positive news (See Chapter 6).	Increase social competence
5	Optimism	Handling Losses	In-Training	15 mins	Best Possible Team Imagine the best version of your team in six months, one-, and two-years (See Chapter 4).	Increase team well-being Team cohesiveness
5	Mindfulness	Warm Down	In-Training	5 mins	Savasana-Breathwork Box breathing, whilst resting in the savasana/corpse pose (See Chapter 5).	Recovery Reduce anxiety
5	Empathy (motivation)	Team Cohesive	Homework	30 mins	Motive-Based Letter Respond to a letter from someone who is struggling to fit into the team (See Chapter 6),	Improved relationship Prosocial behavior
6	Optimism	Shooting Practice	In-Training	15 mins	Attribution Retraining (repeat) Attribute failure to the lack of effort, and success to personal ability (See Chapter 4),	Better shooting performance Increase resilience Increase overall well-being
6	Mindfulness	Warm Up	In-Training	5 mins	Walking Meditation Close your eyes and pay attention to thoughts, feelings, and sensations, during slow walking (See Chapter 5).	Flow state Reduce anxiety

Chapter 8: Limitations & Future Directions

Limitations

Teaching well-being through sport requires a somewhat different approach, to the current way of conceptualizing, developing, and organizing sports programs. PPE may conflict with the existing pedagogy in performance-based sports education. Firstly, the intricate relationship between sport and competition can be uniquely leveraged. As discussed, competition can be harnessed to teach well-being concepts, such as how to handle losses, and having competition goals to strive for. However, the overemphasis on winning, and not on personal growth, can lead to unhealthy perfectionism, narcissism, cheating, aggression, and other maladaptive behaviors (Ryckman et al., 1994; Orosz et al., 2018). Researchers studying competition orientation found that people with a hypercompetitive orientation, tend to work very hard, have a very strong result-oriented approach (where the end justifies the means), and an intense desire to outperform others (Orosz et al., 2018). This type of mindset can foster unhealthy social comparison, which can be detrimental to one's self-worth and motivation (Diel et al., 2021). The "win-at-all-cost" mentality leaves little room for well-being education, which can be perceived to distract athletes from activities that directly relate to winning. Out of the three well-being skills discussed in this capstone, the empirical evidence suggests that only optimism has a strong case for sports performance enhancement (i.e., rebounding from a loss), but mindfulness and empathy do not.

Secondly, the search for the negatives, or weaknesses in an athlete's ability (and correcting them), is still the norm in many sports settings for performance reasons, particularly in high-performance settings (Merkel, 2013). Positive psychology advocates a strength-based approach, and teaching well-being in such a deficit-based environment may be a radical cultural shift, especially if it involves negative-minded coaches. There is some utility in a deficit-based

approach; however, a balance between the positives and negatives should be maintained, to derive both performance and well-being outcomes. Fredrickson (2013) posited that higher positivity ratios (the ratio of positive to negative affect), are predictive of flourishing mental health and other beneficial outcomes, up to a point. In terms of negative emotions, less is better, down to a point (Fredrickson, 2013). One would argue that well-being skills are more needed in high negativity environments, so that athletes become resilient, and are taught to withstand critical feedback and comments.

Thirdly, teaching well-being through sport has an accessibility issue. As with any sports activity, some people have limited opportunities, or are unable to take part due to disabilities. In such cases, offering a parallel, high-quality classroom-based, well-being education option, creates a more inclusive environment for all. Additionally, not everyone is intrinsically motivated to participate in physical activity. It is my hope that PPE can make sports more inclusive, by eliciting positive emotions during those activities, and shifting the outcomes away from performance-based, to well-being based.

Future Directions

Looking to the future, more randomized control trials are needed to establish the causality, or the mechanisms at play, linking physical activity (and sports) with mental health outcomes for children and adolescents. The evidence for children lags behind the body of research we have on the adult population. A conceptual model was proposed, outlining the possible mechanisms, including neurobiological, psychosocial, and behavioral mechanisms (Lubans et al., 2016), and the current evidence only gives support for improved physical self-concept, as a pathway to global self-esteem and well-being (Lubans et al., 2016).

This capstone reviewed the literature on three well-being skills taught through sport: optimism, mindfulness, and empathy. The natural extension of this capstone is to expand the skills list and develop more sport-based positive psychology interventions to add to the repository. As highlighted in this capstone, there is a gap in the literature in understanding the specificities of various sports, and their relationship with positive psychology concepts. For example, it is not clear which sports are best to teach optimism or mindfulness, and only hypotheses have been offered thus far. There is more work in exploring the unique characteristics found in a variety of sports, and their ability to teach well-being skills. Ultimately, the goal is to create a taxonomy outlining the positive psychology concepts, and how they map against individual sports (or categories of sports) that best teach them.

Conclusion

In this capstone, I introduced the concept of Positive Physical Education (PPE): teaching school-aged children well-being skills through sport. Based on a review of the literature, several sport-based positive psychology interventions were developed, that are aimed to increase optimism, mindfulness, and empathy in school-aged children. These interventions harness our mind-body connection: physical and psychological benefits are shown to be mutually supportive and synergistic, to create an ‘upward spiral’ towards improved well-being. A list of the qualities has been identified, that make sports a great vehicle to teach well-being:

- Setbacks and adversities in sports can be leveraged to develop a more optimistic explanatory style.
- The role of luck lessens the pressure on the individual, and promotes failure attribution away from one’s own ability, and towards effort and practice.
- Exercising in an outdoor setting promotes a sense of awe, and other positive emotions.

- Coaches and PE teachers are role models from whom children could learn vicariously.
- The awareness of body movement and bodily sensations becomes a focal point to cultivate mindfulness.
- The dynamic nature of sport requires total concentration in the activity itself, promoting flow, and leaving little room for rumination and negative thoughts.
- Sports help improve VT, and the activation of the PNS, for a calm and relaxed state.
- Team processes afford many opportunities for social interaction and the development of empathy.
- Exercise produces oxytocin that facilitates social bonding, trust, cooperation, and emotion recognition.

While there are myriad benefits related to psychological resilience and well-being, many individuals have seen psychology as something to be leveraged in service to sports performance – and the evidence that well-being skills enhance sports performance is still unclear. An overemphasis on winning, finding negatives or weaknesses, and inaccessibility issues, may limit people’s willingness to incorporate positive psychology into this context. More research is needed to establish the causality between physical activity and mental health outcomes in children, as well as the unique qualities of sports (or category of sports) to teach well-being.

The evidence that shows that physical activity and sport participation complement and enable academic pursuits is clear, and findings from the latest developments in neuroscience on how exercise influences cognition are encouraging. Reducing the time spent on PE can have detrimental effects on children’s lifelong passion for an active lifestyle and mental well-being.

Supporting the aim of positive education to produce happier and smarter students, the introduction of PPE to schools and extra-curricular sports programs, can capitalize on a set of

activities where school-aged children already spend time. To help young people flourish, we must protect, and actively promote, their physical and psychological health, and build the skills of resilience to help them navigate the vicissitudes in school life, and beyond.

References

- Adler, A., Seligman, M. E., Tetlock, P. E., & Duckworth, A. L. (2016). *Teaching well-being increases academic performance: Evidence from Bhutan, Mexico, and Peru*. Philadelphia, PA: University of Pennsylvania.
- Aherne, C., Moran, A. P., & Lonsdale, C. (2011). The effect of mindfulness training on athletes' flow: An initial investigation. *The Sport Psychologist*, 25(2), 177-189.
<https://doi.org/10.1123/tsp.25.2.177>
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. N. (2015). *Patterns of attachment: A psychological study of the strange situation*. Psychology Press.
- Aknin, L. B., Barrington-Leigh, C. P., Dunn, E. W., Helliwell, J. F., Burns, J., Biswas-Diener, R., ... & Norton, M. I. (2013). Prosocial spending and well-being: cross-cultural evidence for a psychological universal. *Journal of Personality and Social Psychology*, 104(4), 635-652. <https://doi.org/10.1037/a0031578>
- Anders Ericsson, K. (2008). Deliberate practice and acquisition of expert performance: a general overview. *Academic Emergency Medicine*, 15(11), 988-994. <https://doi.org/10.1111/j.155>
- Anderson, C. L., Monroy, M., & Keltner, D. (2018). Awe in nature heals: Evidence from military veterans, at-risk youth, and college students. *Emotion*, 18(8), 1195-1202.
<https://doi.org/10.1037/emo0000442>
- Aubert, S., Barnes, J. D., Demchenko, I., Hawthorne, M., Abdeta, C., Abi Nader, P., ... & Tremblay, M. S. (2022). Global Matrix 4.0 Physical Activity Report Card grades for children and adolescents: Results and analyses from 57 countries. *Journal of Physical Activity and Health*, 19(11), 700-728.

- Aylett, E., Small, N., & Bower, P. (2018). Exercise in the treatment of clinical anxiety in general practice—a systematic review and meta-analysis. *BMC Health Services Research*, *18*, 1-18. <https://doi.org/10.1186/s12913-018-3313-5>
- Babiyak, M., Blumenthal, J. A., Herman, S., Khatri, P., Doraiswamy, M., Moore, K., Edward, C., Baldewicz, T. & Krishnan, K. R. (2000). Exercise treatment for major depression: maintenance of therapeutic benefit at 10 months. *Psychosomatic Medicine*, *62*(5), 633-638. <https://doi.org/10.1097/00006842-200009000-00006>
- Bakermans-Kranenburg, M. J., & Van Ijzendoorn, M. H. (2013). Sniffing around oxytocin: review and meta-analyses of trials in healthy and clinical groups with implications for pharmacotherapy. *Translational Psychiatry*, *3*(5), e258-e258.
- Banerjee, M., Cavanagh, K., & Strauss, C. (2017). A qualitative study with healthcare staff exploring the facilitators and barriers to engaging in a self-help mindfulness-based intervention. *Mindfulness*, *8*, 1653-1664. <https://doi.org/10.1007/s12671-017-0740-z>
- Barton, J., & Pretty, J. (2010). What is the best dose of nature and green exercise for improving mental health? A multi-study analysis. *Environmental Science & Technology*, *44*(10), 3947-3955.
- Bedir, D., Agduman, F., Bedir, F., & Erhan, S. E. (2023). The mediator role of communication skill in the relationship between empathy, team cohesion, and competition performance in curlers. *Frontiers in Psychology*, *14*. <https://doi.org/10.3389/fpsyg.2023.1115402>
- Biddle, S., Ciaccioni, S., Thomas, G., & Vergeer, I. (2019). Physical activity and mental health in children and adolescents: An updated review of reviews and an analysis of causality. *Psychology of Sport and Exercise*, *42*, 146-155. <https://doi.org/10.1016/j.psychsport.2018.08.011>

- Biddle, S. & Mutrie, N. (2007). *Psychology of physical activity: Determinants, well-being and interventions*. Routledge.
- Biegel, G. M., Brown, K. W., Shapiro, S. L., & Schubert, C. M. (2009). Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial. *Journal of Consulting and Clinical Psychology, 77*(5), 855-866.
- Blank, M. E. (2019). *The physiology of social-emotional learning: Integrating biomarkers of self-regulation into the assessment and implementation of programs*. (Capstone Projects. 171) [Master dissertation, University of Pennsylvania]
https://repository.upenn.edu/mapp_capstone/171
- Blumenthal, J. A., Babyak, M. A., Doraiswamy, P. M., Watkins, L., Hoffman, B. M., Barbour, K. A., Herman, S., Craighead, W.E., Brosse, A.L., Waugh, R. & Hinderliter, A. (2007). Exercise and pharmacotherapy in the treatment of major depressive disorder. *Psychosomatic Medicine, 69*(7), 587-596.
<https://doi.org/10.1097%2FPSY.0b013e318148c19a>
- Boehm, J. K., & Kubzansky, L. D. (2012). The heart's content: the association between positive psychological well-being and cardiovascular health. *Psychological Bulletin, 138*(4), 655-691. <https://doi.org/10.1037/a0027448>
- Boele, S., Van der Graaff, J., De Wied, M., Van der Valk, I. E., Crocetti, E., & Branje, S. (2019). Linking parent–child and peer relationship quality to empathy in adolescence: A multilevel meta-analysis. *Journal of Youth and Adolescence, 48*, 1033-1055.
<https://doi.org/10.1007/s10964-019-00993-5>

- Boudreau, P., Mackenzie, S. H., & Hodge, K. (2020). Flow states in adventure recreation: A systematic review and thematic synthesis. *Psychology of Sport and Exercise, 46*, 101611. <https://doi.org/10.1016/j.psychsport.2019.101611>
- Brani, O., Hefferon, K., Lomas, T., Ivtzan, I., & Painter, J. (2014). The impact of body awareness on subjective wellbeing: The role of mindfulness. *International Body Psychotherapy Journal, 13*(1), 95-107.
- Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry, 18*(4), 211-237. <https://doi.org/10.1080/10478400701598298>
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822-848. <https://doi.org/10.1037/0022-3514.84.4.822>
- Brunwasser, S. M., Gillham, J. E., & Kim, E. S. (2009). A meta-analytic review of the Penn Resiliency Program's effect on depressive symptoms. *Journal of Consulting and Clinical Psychology, 77*(6), 1042-1054. <https://doi.org/10.1037/a0017671>
- Buchheit, M., Platat, C., Oujaa, M., & Simon, C. (2006). Habitual physical activity, physical fitness and heart rate variability in preadolescents. *International Journal of Sports Medicine, 28*(3), 204-210. <https://doi.org/10.1055/s-2006-924296>
- Buecker, S., Simacek, T., Ingwersen, B., Terwiel, S., & Simonsmeier, B. A. (2021). Physical activity and subjective well-being in healthy individuals: a meta-analytic review. *Health Psychology Review, 15*(4), 574-592.

- Burke, C. A. (2010). Mindfulness-based approaches with children and adolescents: A preliminary review of current research in an emergent field. *Journal of Child and Family Studies, 19*(2), 133-144. <https://doi.org/10.1007/s10826-009-9282-x>
- Burns, J. W. (2006). The role of attentional strategies in moderating links between acute pain induction and subsequent psychological stress: evidence for symptom-specific reactivity among patients with chronic pain versus healthy nonpatients. *Emotion, 6*(2), 180-192. <https://doi.org/10.1037/1528-3542.6.2.180>
- Carron, A. V., Bray, S. R., & Eys, M. A. (2002). Team cohesion and team success in sport. *Journal of Sports Sciences, 20*(2), 119-126.
- Carver, C., Scheier, M., & Segerstrom, S. (2010). Optimism. *Clinical Psychology Review, 30*, 879-889.
- Cathcart, S., McGregor, M., & Groundwater, E. (2014). Mindfulness and flow in elite athletes. *Journal of Clinical Sport Psychology, 8*(2), 119-141. <https://doi.org/10.1123/jcsp.2014-0018>
- Chan, H. H. K., Kwong, H. Y. C., Shu, G. L. F., Ting, C. Y., & Lai, F. H. Y. (2021). Effects of experiential learning programmes on adolescent prosocial behaviour, empathy, and subjective well-being: a systematic review and meta-analysis. *Frontiers in Psychology, 3296*.
- Cheang, R., Gillions, A., & Sparkes, E. (2019). Do mindfulness-based interventions increase empathy and compassion in children and adolescents: A systematic review. *Journal of Child and Family Studies, 28*, 1765-1779. <https://doi.org/10.1007/s10826-019-01413-9>
- Chekroud, S. R., Gueorguieva, R., Zheutlin, A. B., Paulus, M., Krumholz, H. M., Krystal, J. H., & Chekroud, A. M. (2018). Association between physical exercise and mental health in 1-

- 2 million individuals in the USA between 2011 and 2015: a cross-sectional study. *The Lancet Psychiatry*, 5(9), 739-746.
- Clarke, E., DeNora, T., & Vuoskoski, J. (2015). Music, empathy and cultural understanding. *Physics of Life Reviews*, 15, 61–88. <https://doi.org/10.1016/j.plrev.2015.09.001>
- Connaughton, D., Wadey, R., Hanton, S., & Jones, G. (2008). The development and maintenance of mental toughness: Perceptions of elite performers. *Journal of Sports Sciences*, 26(1), 83-95.
- Coopersmith, J. (2023). Musical flourishes: Lessons from a conservatory. In A. Celenza (Ed.), *Music and human flourishing*. Oxford University Press.
- Cotman, C. W., & Berchtold, N. C. (2002). Exercise: a behavioral intervention to enhance brain health and plasticity. *Trends in Neurosciences*, 25(6), 295-301.
- Crum, A. J., & Langer, E. J. (2007). Mind-set matters: Exercise and the placebo effect. *Psychological Science*, 18(2), 165-171. <https://doi.org/10.1111/j.1467-9280.2007.01867.x>
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. Harper Perennial.
- Csikszentmihalyi, M., Latter, P., & Weinkauff Duranso, C. (2017). *Running flow*. Human Kinetics.
- Dadds, M. R., Cauchi, A. J., Wimalaweera, S., Hawes, D. J., & Brennan, J. (2012). Outcomes, moderators, and mediators of empathic-emotion recognition training for complex conduct problems in childhood. *Psychiatry Research*, 199(3), 201-207.
- De Wied, M., Branje, S. J., & Meeus, W. H. (2007). Empathy and conflict resolution in friendship relations among adolescents. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, 33(1), 48-55.

- Deng, J., Zhou, F., Hou, W., Heybati, K., Lohit, S., Abbas, U., ... & Heybati, S. (2023). Prevalence of mental health symptoms in children and adolescents during the COVID-19 pandemic: A meta-analysis. *Annals of the New York Academy of Sciences*, 1520(1), 53-73.
- Diel, K., Broeker, L., Raab, M., & Hofmann, W. (2021). Motivational and emotional effects of social comparison in sports. *Psychology of Sport and Exercise*, 57, 102048.
<https://doi.org/10.1016/j.psychsport.2021.102048>
- Diener, E., & Seligman, M. E. (2002). Very happy people. *Psychological Science*, 13(1), 81-84.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276-302.
<https://doi.org/10.1037/0033-2909.125.2.276>
- Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., Lambourne, K. & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: a systematic review. *Medicine and Science in Sports and Exercise*, 48(6), 1197-1222. <https://doi.org/10.1249%2FMSS.0000000000000901>
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087-1101. <https://doi.org/10.1037/0022-3514.92.6.1087>
- Durkheim, E. (1915). *The elementary forms of the religious life: A study in religious sociology*. Macmillan.
- Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random house.
- Edwards, D. J., Edwards, S. D., & Basson, C. J. (2004). Psychological well-being and physical self-esteem in sport and exercise. *International Journal of Mental Health Promotion*, 6(1), 25-32. <https://doi.org/10.1080/14623730.2004.9721921>

- Eisenberg, N., Spinrad, T. L., & Morris, A. (2003). Empathy-related responding in children. In M. Killen & J. G. Smetana (Eds.), *Handbook of Moral Development* (pp. 184–207). Psychology Press
- Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sports. *International Journal of Behavioral Nutrition and Physical Activity*, *10*(1), 1-21.
- Ekkekakis, P., Parfitt, G., & Petruzzello, S. J. (2011). The pleasure and displeasure people feel when they exercise at different intensities: decennial update and progress towards a tripartite rationale for exercise intensity prescription. *Sports Medicine*, *41*, 641-671.
- Eskreis-Winkler, L., Shulman, E. P., Young, V., Tsukayama, E., Brunwasser, S. M., & Duckworth, A. L. (2016). Using wise interventions to motivate deliberate practice. *Journal of Personality and Social Psychology*, *111*(5), 728-744.
<https://doi.org/10.1037/pspp0000074>
- Eslea, M., & Rees, J. (2001). At what age are children most likely to be bullied at school?. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, *27*(6), 419-429.
- Faulkner, G., Hefferon, K., & Mutrie, N. (2015). Putting positive psychology in motion through physical activity. In S. Joseph (Ed.), *Positive psychology in practice: Promoting human flourishing in work, health, education, and everyday life* (2nd ed., pp. 207-221). Wiley.
<https://onlinelibrary.wiley.com/doi/10.1002/9781118996874.ch12>

- Fitzgerald, K., & Green, M.C. (2022). Stories for good: Transportation into narrative worlds. In L. Tay, & J. O. Pawelski (Eds.), *The oxford handbook of the positive humanities* (pp. 222-232). Oxford University Press.
- Fletcher, A. (2023). The Lost Optimism of Modern Movie Fairytales. In T. Corrigan (Ed.) *Cinema, Media Studies, and human flourishing*. Oxford University Press.
- Frederickson, B. L. (2009). *Positivity: Top-notch research reveals the upward spiral that will change your life*. Three Rivers Press.
- Fredrickson, B. L. (2013). Updated thinking on positivity ratios. *American Psychologist*, 68(9), 814–822. <https://doi.org/10.1037/a0033584>
- Gable, S. L., & Haidt, J. (2005). What (and why) is positive psychology?. *Review of General Psychology*, 9(2), 103-110. <https://doi.org/10.1037/1089-2680.9.2.103>
- Gable, S. L., Gonzaga, G. C., & Strachman, A. (2006). Will you be there for me when things go right? Supportive responses to positive event disclosures. *Journal of Personality and Social Psychology*, 91(5), 904-917. <https://doi.org/10.1037/0022-3514.91.5.904>
- Gillen, M. C. (2003). Pathway to efficacy: Recognizing cognitive behavioral therapy as an underlying theory for adventure therapy. *Journal of Adventure Education & Outdoor Learning*, 3(1), 93-102.
- Gillham, J., Reivich, K., and Shatté, A. (2001). Building optimism and preventing depressive symptoms in children. In Chang, E. C. (Eds.), *Optimism & pessimism: Implications for theory, research, and practice*. (pp. 301-320). American Psychological Association.
- Gini, G., Albiero, P., Benelli, B., & Altoe, G. (2007). Does empathy predict adolescents' bullying and defending behavior?. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, 33(5), 467-476.

- Gordon, R. A. (2008). Attributional style and athletic performance: Strategic optimism and defensive pessimism. *Psychology of Sport and Exercise*, 9(3), 336-350.
- Gregoire, J., Tuck, S., Hughson, R. L., & Yamamoto, Y. (1996). Heart rate variability at rest and exercise: influence of age, gender, and physical training. *Canadian Journal of Applied Physiology*, 21(6), 455-470. <https://doi.org/10.1139/h96-040>
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*, 57(1), 35-43. [https://doi.org/10.1016/S0022-3999\(03\)00573-7](https://doi.org/10.1016/S0022-3999(03)00573-7)
- Guivernau, M., & Duda, J. L. (2002). Moral atmosphere and athletic aggressive tendencies in young soccer players. *Journal of Moral Education*, 31(1), 67-85.
- Haidt, J. (2012). *The righteous mind: Why good people are divided by politics and religion*. Vintage Books.
- Harris, D. J., Vine, S. J., & Wilson, M. R. (2017). Neurocognitive mechanisms of the flow state. *Progress in Brain Research*, 234, 221-243. <https://doi.org/10.1016/bs.pbr.2017.06.012>
- Hefferon, K. (2015). The role of embodiment in optimal functioning. In S. Joseph (Ed.), *Positive psychology in practice: Promoting human flourishing in work, health, education, and everyday life* (2nd ed., pp. 789-806). Wiley.
- Hefferon, K., & Mutrie, N. (2012). Physical activity as a “stellar” positive psychology intervention. In Edmund O. Acevedo (Eds.), *The oxford handbook of exercise psychology*. Oxford Library of Psychology. <https://doi.org/10.1093/oxfordhb/9780195394313.013.0007>
- Ho, E. (2021, June 7). CUHK releases main study results of Child Health Behaviour. The Chinese University of Hong Kong. https://www.fed.cuhk.edu.hk/~hkcisa/HBSC_20210607_pr_e.pdf

- Hofmann, S. G., & Gómez, A. F. (2017). Mindfulness-based interventions for anxiety and depression. *Psychiatric Clinics*, *40*(4), 739-749. <https://doi.org/10.1016/j.psc.2017.08.008>
- Howie, L. D., Lukacs, S. L., Pastor, P. N., Reuben, C. A., & Mendola, P. (2010). Participation in activities outside of school hours in relation to problem behavior and social skills in middle childhood. *Journal of School Health*, *80*(3), 119-125. <https://doi.org/10.1111/j.1746-1561.2009.00475.x>
- Jackson, S. A., & Csikszentmihalyi, M. (1999). *Flow in sports*. Human Kinetics.
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., & Schwartz, G. E. R. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine*, *33*(1), 11-21. https://doi.org/10.1207/s15324796abm3301_2
- Jamieson, J. P., Nock, M. K., & Mendes, W. B. (2012). Mind over matter: reappraising arousal improves cardiovascular and cognitive responses to stress. *Journal of Experimental Psychology: General*, *141*(3), 417-422.
- Jarczok, M. N., Kleber, M. E., Koenig, J., Loerbroks, A., Herr, R. M., Hoffmann, K., Fischer, J., Benyamini, Y. & Thayer, J. F. (2015). Investigating the associations of self-rated health: heart rate variability is more strongly associated than inflammatory and other frequently used biomarkers in a cross sectional occupational sample. *PloS One*, *10*(2), e0117196. <https://doi.org/10.1371/journal.pone.0117196>
- Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective, & Behavioral Neuroscience*, *7*(2), 109-119. <https://doi.org/10.3758/CABN.7.2.109>

Jolliffe, D., & Farrington, D. P. (2006). Development and validation of the Basic Empathy Scale. *Journal of Adolescence*, 29(4), 589-611.

International Positive Education Network. (n.d.). *About us*. <https://www.ipen-network.com/about-us>

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. Delacorte.

Kaya, M., & Erdem, C. (2021). Students' well-being and academic achievement: A meta-analysis study. *Child Indicators Research*, 14(5), 1743-1767.

<https://doi.org/10.1007/s12187-021-09821-4>

Kee, Y. H., & Wang, C. J. (2008). Relationships between mindfulness, flow dispositions and mental skills adoption: A cluster analytic approach. *Psychology of Sport and Exercise*, 9(4), 393-411. <https://doi.org/10.1016/j.psychsport.2007.07.001>

Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chapleau, M., Paquin, K. & Hofmann, S. G. (2013). Mindfulness-based therapy: a comprehensive meta-analysis. *Clinical Psychology Review*, 33(6), 763-771.

<https://doi.org/10.1016/j.cpr.2013.05.005>

Khoury, B., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: A meta-analysis. *Journal of Psychosomatic Research*, 78(6), 519-528. <https://doi.org/10.1016/j.jpsychores.2015.03.009>

Kleinke, C. L., Peterson, T. R., & Rutledge, T. R. (1998). Effects of self-generated facial expressions on mood. *Journal of Personality and Social Psychology*, 74(1), 272-279.

- Kok, B. E., & Fredrickson, B. L. (2010). Upward spirals of the heart: Autonomic flexibility, as indexed by vagal tone, reciprocally and prospectively predicts positive emotions and social connectedness. *Biological Psychology*, 85(3), 432-436.
- Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education*, 4(2), 193-212.
- Laborde, S., Guillén, F., & Mosley, E. (2016). Positive personality-trait-like individual differences in athletes from individual-and team sports and in non-athletes. *Psychology of Sport and Exercise*, 26, 9-13.
- Laborde, S., Brüll, A., Weber, J., & Anders, L. S. (2011). Trait emotional intelligence in sports: A protective role against stress through heart rate variability?. *Personality and Individual Differences*, 51(1), 23-27.
- Lahart, I., Darcy, P., Gidlow, C., & Calogiuri, G. (2019). The effects of green exercise on physical and mental wellbeing: A systematic review. *International Journal of Environmental Research and Public Health*, 16(8), 1352.
<https://doi.org/10.3390/ijerph16081352>
- Lee, B. (1975) *The Tao of Jeet Kune Do*. Turtleback. Santa Clarita.
- Littrell, J. (2008). The mind-body connection: not just a theory anymore. *Social Work in Health Care*, 46(4), 17-37. https://doi.org/10.1300/J010v46n04_02
- Locke, E. A. (1996). Motivation through conscious goal setting. *Applied and Preventive Psychology*, 5(2), 117-124. [https://doi.org/10.1016/S0962-1849\(96\)80005-9](https://doi.org/10.1016/S0962-1849(96)80005-9)
- Loewenstein, G. (1999). Because it is there: The challenge of mountaineering... for utility theory. *Kyklos*, 52(3), 313–343. <https://doi.org/10.1111/1467-6435.00090>

- Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., Kelly, P., Smith, J., Raine, L. & Biddle, S. (2016). Physical activity for cognitive and mental health in youth: a systematic review of mechanisms. *Pediatrics*, *138*(3).
- Lukianoff, G. & Haidt, J. (2019). *The coddling of the American mind: How good intentions and bad ideas are setting up a generation for failure*. Penguin Press.
- Lykken, D., & Tellegen, A. (1996). Happiness is a stochastic phenomenon. *Psychological Science*, *7*(3), 186-189.
- Lyubomirsky, S. (2008). *The how of happiness: A scientific approach to getting the life you want*. penguin.
- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success?. *Psychological Bulletin*, *131*(6), 803-855. <https://doi/10.1037/0033-2909.131.6.803>
- Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, *9*(2), 111-131.
- Malouff, J. M., & Schutte, N. S. (2017). Can psychological interventions increase optimism? A meta-analysis. *The Journal of Positive Psychology*, *12*(6), 594-604.
- Martin, L. J., Hathaway, G., Isbester, K., Mirali, S., Acland, E. L., Niederstrasser, N., Slepian, P.; Trost, Z.; Bartz, J. A.; Sapolsky, R. M.; Sternberg, W. F.; Levitin, D. J. & Mogil, J. S. (2015). Reducing social stress elicits emotional contagion of pain in mouse and human strangers. *Current Biology*, *25*(3), 326-332.
- Martin-Krumm, C. P., Sarrazin, P. G., Peterson, C., & Famose, J. P. (2003). Explanatory style and resilience after sports failure. *Personality and Individual Differences*, *35*(7), 1685-1695.

- McGrath, R. & Adler, A. (2022). Skills for life: A review of life skills and their measurability, malleability, and meaningfulness, IADB: Inter-American Development Bank. United States of America. Retrieved from <https://policycommons.net/artifacts/2653315/skills-for-life/3676189/> on 12 Jun 2023. <http://dx.doi.org/10.18235/0004414>
- Meevissen, Y. M., Peters, M. L., & Alberts, H. J. (2011). Become more optimistic by imagining a best possible self: Effects of a two week intervention. *Journal of Behavior Therapy and Experimental Psychiatry*, 42(3), 371-378.
- Mehta, N. (2011). Mind-body dualism: A critique from a health perspective. *Mens Sana Monographs*, 9(1), 202-209.
- Merkel, D. L. (2013). Youth sport: positive and negative impact on young athletes. *Open Access Journal of Sports Medicine*, 151-160.
- Milona, M. (2020). *Hope and optimism*. John Templeton Foundation.
- Miserandino, M. (1998). Attributional retraining as a method of improving athletic performance. *Journal of Sport Behavior*, 21(3), 286-298.
- Mousa, S. (2020). Building social cohesion between Christians and Muslims through soccer in post-ISIS Iraq. *Science*, 369(6505), 866-870. <https://doi.org/10.1126/science.abb3153>
- Murdoch, E. M., Lines, R. L., Crane, M. F., Ntoumanis, N., Brade, C., Qusted, E., Ayers, J. & Gucciardi, D. F. (2021). The effectiveness of stress regulation interventions with athletes: A systematic review and multilevel meta-analysis of randomised controlled trials. *International Review of Sport and Exercise Psychology*, 1-37. <https://doi.org/10.1080/1750984X.2021.1977974>

- Murphy, B. C., Shepard, S. A., Eisenberg, N., Fabes, R. A., & Guthrie, I. K. (1999). Contemporaneous and longitudinal relations of dispositional sympathy to emotionality, regulation, and social functioning. *The Journal of Early Adolescence, 19*(1), 66-97.
- Mutz, M., & Müller, J. (2016). Mental health benefits of outdoor adventures: Results from two pilot studies. *Journal of Adolescence, 49*, 105-114.
- Nelson, S. K., Della Porta, M. D., Jacobs Bao, K., Lee, H. C., Choi, I., & Lyubomirsky, S. (2015). 'It's up to you': Experimentally manipulated autonomy support for prosocial behavior improves well-being in two cultures over six weeks. *The Journal of Positive Psychology, 10*(5), 463-476.
- Niedermeier, M., Einwanger, J., Hartl, A., & Kopp, M. (2017). Affective responses in mountain hiking—A randomized crossover trial focusing on differences between indoor and outdoor activity. *PLoS One, 12*(5), e0177719 <https://doi.org/10.1371/journal.pone.0177719>
- Norrish, J. M., Williams, P., O'Connor, M., & Robinson, J. (2013). An applied framework for positive education. *International Journal of Wellbeing, 3*(2).
- Nummenmaa, L., Glerean, E., Hari, R., & Hietanen, J. K. (2014). Bodily maps of emotions. *Proceedings of the National Academy of Sciences, 111*(2), 646-651.
- OECD (2017). PISA 2015 Results (Volume III): Students' Well-Being, PISA, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264273856-en>
- Orbach, I., Singer, R., & Price, S. (1999). An attribution training program and achievement in sport. *The Sport Psychologist, 13*(1), 69-82.
- Orosz, G., Tóth-Király, I., Büki, N., Ivaskevics, K., Bóthe, B., & Fülöp, M. (2018). The four faces of competition: The development of the Multidimensional Competitive Orientation Inventory. *Frontiers in Psychology, 9*, 779.

- Pascoe, M. C., Thompson, D. R., & Ski, C. F. (2017a). Yoga, mindfulness-based stress reduction and stress-related physiological measures: A meta-analysis. *Psychoneuroendocrinology*, 86, 152-168. <https://doi.org/10.1016/j.psyneuen.2017.08.008>
- Pascoe, M. C., Thompson, D. R., Jenkins, Z. M., & Ski, C. F. (2017b). Mindfulness mediates the physiological markers of stress: Systematic review and meta-analysis. *Journal of Psychiatric Research*, 95, 156-178. <https://doi.org/10.1016/j.jpsychires.2017.08.004>
- Pawelski, J. O., & Moores, D. J. (2013). *The eudaimonic turn well-being in literary studies*. Fairleigh Dickinson University Press.
- Pawelski, J. O. (2016). Defining the 'positive' in positive psychology: Part I. A descriptive analysis. *The Journal of Positive Psychology*, 11(4), 339-356. <https://doi.org/10.1080/17439760.2015.1137627>
- Pepping, G. J., & Timmermans, E. J. (2012). Oxytocin and the biopsychology of performance in team sports. *The Scientific World Journal*, 2012. <https://doi.org/10.1100/2012/567363>
- Peters, B. J., Overall, N. C., & Jamieson, J. P. (2014). Physiological and cognitive consequences of suppressing and expressing emotion in dyadic interactions. *International Journal of Psychophysiology*, 94(1), 100-107.
- Plante, T. G., & Rodin, J. (1990). Physical fitness and enhanced psychological health. *Current Psychology*, 9, 3-24.
- Porges, S. W. (2007). The polyvagal perspective. *Biological Psychology*, 74(2), 116-143. <https://doi.org/10.1016/j.biopsycho.2006.06.009>
- Porges, S. W. (1995). Cardiac vagal tone: a physiological index of stress. *Neuroscience & Biobehavioral Reviews*, 19(2), 225-233. [https://doi.org/10.1016/0149-7634\(94\)00066-A](https://doi.org/10.1016/0149-7634(94)00066-A)

- Pretty, J., Peacock, J., Sellens, M., & Griffin, M. (2005). The mental and physical health outcomes of green exercise. *International Journal of Environmental Health Research*, 15(5), 319-337.
- Prilleltensky, I. (2020). Mattering at the intersection of psychology, philosophy, and politics. *American Journal of Community Psychology*, 65(1-2), 16-34.
- Prilleltensky, I & Dietz, S & Prilleltensky, O & Myers, N & Rubenstein, C & Jin, Y & McMahon, A. (2015). Assessing multidimensional well-being: Development and validation of the I COPPE scale. *Journal of Community Psychology*, 43(2), 199-226.
- Rasclé, O., Le Foll, D., & Higgins, N. C. (2008). Attributional retraining alters novice golfers' free practice behavior. *Journal of Applied Sport Psychology*, 20(2), 157-164.
- Rassovsky, Y., Harwood, A., Zagoory-Sharon, O., & Feldman, R. (2019). Martial arts increase oxytocin production. *Scientific Reports*, 9(1), 1-8.
- Ratey, J. J. (2008). *Spark: The revolutionary new science of exercise and the brain*. Hachette UK.
- Ratey, J. J., & Manning, R. (2014). *Go wild: Free your body and mind from the afflictions of civilization*. Hachette UK.
- Rebar, A. L., Stanton, R., Geard, D., Short, C., Duncan, M. J., & Vandelanotte, C. (2015). A meta-meta-analysis of the effect of physical activity on depression and anxiety in non-clinical adult populations. *Health Psychology Review*, 9(3), 366-378.
<https://doi.org/10.1080/17437199.2015.1022901>
- Reivich, K., & Shatté, A. (2002). *The resilience factor: 7 essential skills for overcoming life's inevitable obstacles*. Broadway books.

- Rettew, D., & Reivich, K. (1995). Sports and explanatory style. In G. M. Buchanan and M. E. P. Seligman (Eds.), *Explanatory style* (pp 173-186). Lawrence Erlbaum Associates, Inc.
- Rodriguez-Ayllon, M., Neumann, A., Hofman, A., Voortman, T., Lubans, D. R., Yang-Huang, J., Jensen P. W., Raat, H., Vernooij, M. W., & Muetzel, R. L. (2023). Neurobiological, psychosocial, and behavioral mechanisms mediating associations between physical activity and psychiatric symptoms in youth in the Netherlands. *JAMA Psychiatry*, *80*(5), 451-458.
- Rusk, R. D., & Waters, L. E. (2013). Tracing the size, reach, impact, and breadth of positive psychology. *The Journal of Positive Psychology*, *8*(3), 207-221.
<https://doi.org/10.1080/17439760.2013.777766>
- Russell, K. C. (2000). Exploring how the wilderness therapy process relates to outcomes. *Journal of Experiential Education*, *23*(3), 170-176.
- Ryckman, R. M., Thornton, B., & Butler, J. C. (1994). Personality correlates of the hypercompetitive attitude scale: Validity tests of Horney's theory of neurosis. *Journal of Personality Assessment*, *62*(1), 84-94.
- Salmon, P., Hanneman, S., & Harwood, B. (2010). Associative/dissociative cognitive strategies in sustained physical activity: Literature review and proposal for a mindfulness-based conceptual model. *The Sport Psychologist*, *24*(2), 127-156.
- Salvy, S. J. (2021). Psychological interventions in prostate cancer: a farewell to mind–body dualism. *Prostate Cancer and Prostatic Diseases*, *24*(3), 587-588.
- Sappington, R., & Longshore, K. (2015). Systematically reviewing the efficacy of mindfulness-based interventions for enhanced athletic performance. *Journal of Clinical Sport Psychology*, *9*(3), 232-262. <https://doi.org/10.1123/jcsp.2014-0017>

- Sattelmair, J., & Raley, J. J. (2009). Physically Active Play and Cognition: An Academic Matter?. *American Journal of Play*, 1(3), 365-374.
- Scheier, M.F., & Carver, C.S. (2018) Dispositional optimism and health: A long look back and a quick look forward. *American Psychologist*, 73(9), 1082-1094.
- Segerstrom, S. C. (2007). Optimism and resources: Effects on each other and on health over 10 years. *Journal of Research in Personality*, 41(4), 772–786.
- Seligman, M. E. P. (2002). Positive psychology, positive prevention, and positive therapy. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 3-9). Oxford University Press.
- Seligman, M. E. P. (2006). *Learned Optimism: How to change your mind and your life*. Vintage Books.
- Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. Simon and Schuster.
- Seligman, M. E. P., Ernst, R. M., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: Positive psychology and classroom interventions. *Oxford Review of Education*, 35(3), 293-311. <https://doi.org/10.1080/03054980902934563>
- Seligman, M. E. P., Nolen-Hoeksema, S., Thornton, N., & Thornton, K. M. (1990). Explanatory style as a mechanism of disappointing athletic performance. *Psychological Science*, 1(2), 143-146.
- Sevdalis, V., & Raab, M. (2014). Empathy in sports, exercise, and the performing arts. *Psychology of Sport and Exercise*, 15(2), 173-179.

- Sheard, M., & Golby, J. (2006). Effect of a psychological skills training program on swimming performance and positive psychological development. *International Journal of Sport and Exercise Psychology*, 4(2), 149-169.
- Shima, T., Tai, K., Nakao, H., Shimofure, T., Arai, Y., Kiyama, K., & Onizawa, Y. (2021). Association between self-reported empathy and sport experience in young adults. *Journal of Physical Education and Sport*, 21(1), 66-72.
- Sibley, B., & Etnier J. (2003). The relationship between physical activity and cognition in children: A meta-analysis. *Pediatric Exercise Science*, 15(3), 243–256.
<https://doi.org/10.1123/pes.15.3.243>
- Sicouri, G., March, S., Pellicano, E., De Young, A. C., Donovan, C. L., Cobham, V. E., ... & Hudson, J. L. (2023). Mental health symptoms in children and adolescents during COVID-19 in Australia. *Australian & New Zealand Journal of Psychiatry*, 57(2), 213-229.
- Smith, P. J., & Blumenthal, J. A. (2013). Exercise and physical activity in the prevention and treatment of depression. In P. Ekkekakis (Eds.). *Routledge handbook of physical activity and mental health* (pp. 145–160). London: Routledge.
- Solberg Nes, L., Evans, D. R., & Segerstrom, S. C. (2009). Optimism and college retention: Mediation by motivation, performance, and adjustment. *Journal of Applied Social Psychology*, 39(8), 1887-1912.
- Southwick, S. M., & Charney, D. S. (2018). *Resilience: The science of mastering life's greatest challenges*. Cambridge University Press.
- Spinrad, T. A. Y., & Eisenberg, N. (2014). Empathy, prosocial behavior, and positive development in schools. In M.J. Furlong, R. Gilman and E.S. Huebner (Eds.). *Handbook of positive psychology in schools* (pp. 90-106). Routledge.

- Stellar, J. E., John-Henderson, N., Anderson, C. L., Gordon, A. M., McNeil, G. D., & Keltner, D. (2015). Positive affect and markers of inflammation: Discrete positive emotions predict lower levels of inflammatory cytokines. *Emotion, 15*(2), 129–133.
<https://doi.org/10.1037/emo0000033>
- Sturm, J., Plöderl, M., Fartacek, C., Kralovec, K., Neunhäuserer, D., Niederseer, D., Hitzl W, Niebauer J, Schiepek G, & Fartacek, R. (2012). Physical exercise through mountain hiking in high-risk suicide patients. A randomized crossover trial. *Acta Psychiatrica Scandinavica, 126*(6), 467-475.
- Tay, L. & Pawelski, J. O. (2022). Introduction: The role of the arts and humanities in human flourishing. In L. Tay & J. O. Pawelski (Eds.), *The oxford handbook of the positive humanities* (pp. 3-16). Oxford University Press.
- Taylor, J.L. (2009). Proprioception. *Encyclopedia of Neuroscience* (p.1143-1149)
<https://doi.org/10.1016/B978-008045046-9.01907-0>
- Teding van Berkhout, E., & Malouff, J. M. (2016). The efficacy of empathy training: A meta-analysis of randomized controlled trials. *Journal of Counseling Psychology, 63*(1), 32.
<https://doi.org/10.1037/cou0000093>
- Tindle, H. A., Chang, Y. F., Kuller, L. H., Manson, J. E., Robinson, J. G., Rosal, M. C., Siegle, G. & Matthews, K. A. (2009). Optimism, cynical hostility, and incident coronary heart disease and mortality in the Women’s Health Initiative. *Circulation, 120*(8), 656-662.
<https://doi.org/10.1161/CIRCULATIONAHA.108.827642>
- Treves, I. N., Tello, L. Y., Davidson, R. J., & Goldberg, S. B. (2019). The relationship between mindfulness and objective measures of body awareness: A meta-analysis. *Scientific Reports, 9*(1), 1-12. <https://doi.org/10.1038/s41598-019-53978-6>

- Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, 86(2), 320–333. <https://doi.org/10.1037/0022-3514.86.2.320>
- van den Berg, A. E., & Beute, F. (2021). Walk it off! The effectiveness of walk and talk coaching in nature for individuals with burnout-and stress-related complaints. *Journal of Environmental Psychology*, 76, 101641.
- Van Praag, H., Shubert, T., Zhao, C., & Gage, F. H. (2005). Exercise enhances learning and hippocampal neurogenesis in aged mice. *Journal of Neuroscience*, 25(38), 8680-8685.
- Voss, M. W., Nagamatsu, L. S., Liu-Ambrose, T., & Kramer, A. F. (2011). Exercise, brain, and cognition across the life span. *Journal of Applied Physiology*, 111(5), 1505-1513.
- Weisz, E., & Zaki, J. (2017). Empathy building interventions: A review of existing work and suggestions for future directions. In E. M. Seppälä, E. Simon-Thomas, S. L. Brown, M. C. Worline, C. D. Cameron, and J. R. Doty (Eds.) *The oxford handbook of compassion science* (pp 205-217). Oxford University Press.
- Weisz, E., Ong, D. C., Carlson, R. W., & Zaki, J. (2021). Building empathy through motivation-based interventions. *Emotion*, 21(5), 990-999. <https://doi.org/10.1037/emo0000929>
- White, M. A., & Waters, L. E. (2015). A case study of ‘The Good School:’ Examples of the use of Peterson’s strengths-based approach with students. *The Journal of Positive Psychology*, 10(1), 69-76.
- White, M. A. (2016). Why won’t it stick? Positive psychology and positive education. *Psychology of Well-being*, 6(1), 1-16. <https://doi.org/10.1186/s13612-016-0039-1>
- Whitehead, M. (2013). Definition of physical literacy and clarification of related issues. *Icsppe Bulletin*, 65(1.2), 28-33.

- Wiese, C. W., Kuykendall, L., & Tay, L. (2018). Get active? A meta-analysis of leisure-time physical activity and subjective well-being. *The Journal of Positive Psychology, 13*(1), 57-66. <https://doi.org/10.1080/17439760.2017.1374436>
- Xia, T., Hu, H., Seritan, A. L., & Eisendrath, S. (2019). The many roads to mindfulness: a review of nonmindfulness-based interventions that increase mindfulness. *The Journal of Alternative and Complementary Medicine, 25*(9), 874-889. <https://doi.org/10.1089/acm.2019.0137>
- Yin, Y., & Wang, Y. (2023). Is empathy associated with more prosocial behaviour? A meta-analysis. *Asian Journal of Social Psychology, 26*(1), 3-22.
- Yüksel, O., Ateş, M., Kızıldağ, S., Yüce, Z., Koç, B., Kandış, S., Guvendi, G., Karakilic, A., Gumus, H., & Uysal, N. (2019). Regular aerobic voluntary exercise increased oxytocin in female mice: the cause of decreased anxiety and increased empathy-like behaviors. *Balkan Medical Journal, 36*(5), 257-262.