

**The Effects of a Mindfulness and Acceptance-Based Training Program
on Relevant Psychological Factors and Sport Training Performance
in Hong Kong Elite Adolescent Athletes**

by

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Statement of Originality

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Abstract

Objectives: This research aimed to examine the effectiveness of a specifically designed mindfulness-acceptance-insight-commitment (MAIC) training program on relevant psychological factors (i.e., mindfulness, acceptance, performance-related satisfaction) and sport training performance for elite adolescent athletes from Hong Kong. And it also aimed to explore the athletes' real experiences (i.e., receptiveness and perceptions) of completing the MAIC program. Two studies were included in this research. The objective of study I, as a pilot study for study II, was to preliminarily testify the effectiveness of the MAIC. The objective of study II was to further examine the effectiveness of the MAIC, and explore the real experiences of the athletes towards the MAIC program.

Methods & Design: A multiple-baseline single case design was used in study I to preliminarily evaluate the effectiveness of the MAIC in four adolescent elite athletes from the Hong Kong Sports Institute (HKSI). The mixed-method was used in study II, including a randomized controlled trial (RCT) part and a qualitative exploration part. The RCT part was conducted through a 2 (groups) x 3 (data collection points) design with 40 athletes, who were randomly assigned in to the MAIC training group (MT; $n = 20$, $M_{\text{age}} = 15.65$) and the control group (CG; $n = 20$, $M_{\text{age}} = 15.85$), to further testify the effectiveness of the MAIC on the athletes from the HKSI. Following the RCT part, the qualitative part was used to explore the athletes' real experiences towards the MAIC program. In this part, all athletes participating in the MAIC program were invited to join a semi-structure interview voluntarily, yet only 14 of 20 volunteered to take the interview, respectively. The Visual Analysis and Non-Overlap of All Pairs (NAP) were used for study I, and 2x3 mixed-design ANOVA and thematic analysis were used for study II.

Results: The results revealed that the MAIC training program was effective on improving the athletes' mindfulness, acceptance, performance-related satisfaction, and sport training

performance. However, the effects on the mindfulness, acceptance, performance-related satisfaction and sport training performance all dropped at the following-up data point compared to post-training, and the acceptance level of the MT athletes didn't have significant difference from the CG athletes at the following-up data point. Furthermore, through the thematic analysis, the qualitative part of study II generated four general dimensions, including (a) Attitude towards to the MAIC training, (b) Reflection on the MAIC learning process, (c) Outcome of the MAIC training, and (d) Recommendation for future MAIC training. Generally, results of the qualitative part were consistent with and supported the quantitative part, that gained in-depth understanding of the athletes' real experience and provided relevant suggestions for the MAIC's further development.

Conclusion: The findings suggested that the specifically designed MAIC training program in this research was effective on improving sport training performance and several psychological factors in elite adolescent athletes from Hong Kong. More researches are still needed to further examine and develop the MAIC training program.

Keywords: mindfulness, acceptance, training performance, psychological training, Hong Kong adolescent elite athletes

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My journey of pursuing the doctoral degree inaugurated since 2014. So far, it has been six years. Sometimes, I can't help to think, oh my god, what a long and tough journey that seems endless. Looking back to the six years of this journey, this special era of my life has been filled with so many things what I never imagined would happen in it. During the six years, I gained a lot, I married my wife, my soul mate always unconditionally supporting me, and we had a lovely daughter, a little charming angel breaking in to my world... During the six years, I lost some of my most cherished, my beloved mother-in-law passed away in 2019 after two years fighting with cancer, and will never have chance to see I reaping the fruit....

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List of Abbreviations

MAIC	Mindfulness-Acceptance-Insight-Commitment training
HKSI	Hong Kong Sports Institute
RCT	Randomized Controlled Trial
MT	Mindfulness Training Group
CG	Control Group
M _{age}	Mean of Age
NAP	Non-Overlap of All Pairs
ANOVA	Analysis of Variance
PST	Psychological Skills Training
FA	Focused Attention
OM	Open Monitoring
MBSR	Mindfulness-Based Stress Reduction
MBCT	Mindfulness-Based Cognitive Therapy
ACT	Acceptance Commitment Therapy
DBT	Dialectical Behavior Therapy
MAC	Mindfulness-Acceptance-Commitment Approach
MSPE	Mindful Sports Performance Enhancement
EdUHK	Education University of Hong Kong
AMQ	Athlete Mindfulness Questionnaire
CV-AAQ II	Chinese Version of Acceptance and Action Questionnaire-II
TCSS	Training and Competition Satisfaction Scale
CRPS	Coach-Rating Performance Scale
ARPS	Athlete Self-Rating Performance Scale
SD _{age}	Standard Deviation of Age

An	Athlete number
LK	Love Kindness
HRV	Heart Rate Variability
SIgA	Saliva Secretory Immunoglobulin A
GS	Graduate School



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Chapter 1: Introduction

Research Background

Athletics sports is such a field fully filled with high challenges and competitions. Every athlete in this field strive to attain optimal performance states and consistently reach high performance goals. For achieving their pursuits, it is certainly undoubted that each of these top athletes needs to face various stress and challenges in their sports career. In order to help athletes to improve their performance and cope with these challenges, over the last 40 years, the traditional psychological skills training (PST), which is influenced mainly from the cognitive-behavioral theories (Bandura, 1977; Meichenbaum, 1977), was predominately used in sport psychology.

The PST focuses on self-control of internal processes, such as thoughts, feelings, and bodily sensations (Harvey, Van Raalte & Brewer, 2002). The psychological interventions stemming from the PST have been utilized to develop athletes' mental skills such as imagery, goal setting, arousal control, self-talk, precompetitive routines and so on. All these control/change-based traditional cognitive-behavioral interventions aim to create the ideal performance state through self-control internal processes such as confidence, attention, emotion, cognition, and bodily states (Hardy, Raalte, & Brewer, 1996). For decades, the PST has been the primary approach for enhancing sport performance. After more than 30 years of basic and applied researches, findings of numerous studies (e.g., Burton, 1989; Daw & Burton, 1994; Maynard, Smith, & Warwick-Evans, 1995; Murphy & Woolfolk, 1987; Weinberg, Seabourne, & Jackson, 1982) have suggested that the traditional PST approaches may actually be effective in modifying those variables theorized to be related to athletic performance, yet, no significant changes in athletic performance were found (Gould, Damarjian, & Greenleaf, 2002; Zaichkowsy & Baltzell, 2001). In other words, the usefulness

of the PST seems limited or dubious for pursuing the optimal athletic performance.

Given the limitation of traditional PST, alternative approaches to performance enhancement are needed. Mindfulness and acceptance-based training approach as an alternation of traditional PST, was initiatively proposed by American sport psychologists Gardner and Moore in 2001 (Gardner & Moore, 2007; Moore & Gardner, 2001). This approach markedly differs in both theoretical assumptions and intervention strategies from the traditional psychological skills training approach that has dominated applied sport psychology. Mindfulness and acceptance-based training was adapted from empirically informed clinical methodology (Hayes, Strosahl, & Wilson, 1999; Segal, Williams, & Teasdale, 2002) and was developed specifically for athletes. Over the last two decades, the mindfulness and acceptance-based training approach have been gaining more and more attention in sport psychology, and got rapid developments in both theory and application (e.g., Gardner, 2001; Gardner & Moore, 2004, 2007, 2012; Moore, 2007, 2009; Moore & Gardner, 2001). A large volume of studies based on the mindfulness and acceptance-based training approach have been conducted among athletes. However, main of these studies were case studies (e.g., Gardner & Moore, 2004; Lutkenhouse, 2007; Schwanhausser, 2009) or open trail studies (e.g., Bernier, Thienot, Codron, & Fournier, 2009), the randomized controlled trials are still rare. In addition, it was found that to date there has been little consideration of the personal experience of athletes who are first exposed to the mindfulness and acceptance-based training, in terms of their receptiveness to the training and their perception of the impact of mindfulness and acceptance practice on their psycho-emotional sport related experience. Based on the literature review, the current research mainly aimed to explore on the following two research directions/gaps, including:

- a. Testify the effectiveness of the mindfulness and acceptance-based training on athletic performance enhancement by randomized controlled trails.

- b. Explore the experience of athletes who participate in the mindfulness and acceptance-based training, in terms of their receptiveness to the training and their perception of the impact of the training on their psycho-emotional sport related experience.

Significance

This research engaged in both mentioned research directions/gaps. In this research, a 2-month, 8 sessions mindfulness and acceptance-based training entitled as the Mindfulness-Acceptance-Insight-Commitment (MAIC) training program developed by the researcher and his colleagues (Si, Zhang, Su, & Zhang, 2014; Si, Zhang, Su, Zhang, Jiang, & Li, 2014) was applied among Hong Kong adolescent elite athletes. It aimed to testify the effectiveness of the MAIC training program on athletes' performance enhancement by randomized controlled trial, and explore the experience of the athletes who will participate in the MAIC training program.

In addition, although mindfulness as the core concept of the mindfulness and acceptance-based training approach derived from the Eastern Buddhism, the Western sport psychology researchers are the pioneers who systematically developed mindfulness and acceptance-based training approach and applied it among athletes. The Eastern researchers' studies on this field are still at the preliminary stage. So far, even no systematically applied research within athletes has been done in the Eastern countries or regions. This research would be an inception. Furthermore, the MAIC, as the first manualized mindfulness and acceptance-based training specifically developed for the population of Chinese athletes, may get inspirations from the results of this research to facilitate it to become a better edition for Chinese athletes, especially for Chinese adolescent athletes.

Aims and Objectives

This research aimed to apply a mindfulness and acceptance-based training approach among Hong Kong adolescent elite athletes. In this research, a mindfulness and acceptance-

based approach named as the Mindfulness-Acceptance-Insight-Commitment (MAIC; Si et al., 2014) training program was originally provided to Hong Kong elite adolescent athletes. There were two studies, study I and study II, included in this research. The objective of study I was to preliminarily testify the effectiveness of the MAIC program on related psychological factors (i.e., mindfulness, acceptance, performance-related satisfaction) and sport training performance of elite adolescent athletes from Hong Kong on the single-case basis. The objective of study II with mixed-method was to further examine the effectiveness of the MAIC program in the Hong Kong elite adolescent athletes, and explore the athletes' real experiences towards the MAIC program.

Research Questions

In order to achieve the mentioned objectives, the research questions addressed by this research were as follows:

- (1) How did the MAIC training impact the athletes' psycho-emotional and sport-related experience:
 - a. To explore the effectiveness of the MAIC training on the athletes' levels of mindfulness and acceptance;
 - b. To explore the effectiveness of the MAIC training on the athletes' training quality and the athletes' performance-related satisfaction.
- (2) How did the athletes experience the MAIC training:
 - a. To explore the athletes' receptiveness to the MAIC training;
 - b. To explore the athletes' perceptions of the impact of the MAIC training.

Delimitations

Delimitations of the current research include:

- a. All athletes was recruited from the Hong Kong Sports Institute (HKSI), the only official training center for elite sports and athletes in Hong Kong.

b. All athletes recruited were scholarship athletes of the HKSI, and adolescents aged from 14 to 19.

Limitations

Limitations of the current research include (the limitations would be further discussed in the discussion part):

a. It is hard to select a large number of samples to participate in researches like the current one, since the adolescent elite athlete population size is not huge and they also always have hectic schedules. Moreover, convincing athletes and their coaches to participate in the research as control group is not easy.

b. It is impossible to develop a general objective performance measure that could be adequately appropriate for multiple sports. In this current research, except the coach-rating training performance was rated by the athletes' coaches, other measures were athletes self-reported.

Definition and Terms

Mindfulness: Mindfulness derived from the Eastern Buddhist scripts. It was commonly defined as intentionally paying attention to the present in a nonjudgmental way, in psychological application (Kabat-Zinn, 1994). It is a psychological process of bring one's attention to experiences occurring at the present (Creswell, 2017; Kabat-zinn, 2013).

Acceptance: Acceptance is usually described as a mental attitude of being nonjudgmental, receptive, and poised towards both internal and external experiences (Desbordes et al., 2015).

Insight: Insight (覺悟), which derived from Chinese Zen Buddhism, is a new awareness or discovery of life, and its manifestation can be observed when an individual establishes a new understanding of this meaning of life and personal value, which strengthens his / her ability to face a variety of life issues (Si, Su, Zhang, Jiang, Li, & Huang, 2020).

Mindfulness and acceptance-based training: A training model involving mindfulness and acceptance as two central components has been developed for athletes' performance enhancement, and its primary focus is to promote a modified relationship with internal experiences (i.e., cognitions, emotions, and physiological sensations), rather than changing these experiences' form or frequency (Gardner & Moore, 2012).

Mindfulness-acceptance-insight-commitment training (MAIC): The MAIC is a manualized mindfulness and acceptance-based training approach specifically developed for Chinese athletes integrated with Chinese sociocultural elements by the researcher and his colleagues (Si et al., 2014).

Focused attention (FA): FA is a type of mindfulness skill to entail the voluntary focusing of attention of a chosen object (Lutz, Slagter, Dunne, & Davidson, 2008).

Open monitoring (OM): OA is a type of mindfulness skill that involves an overt, but unreactive monitoring of the content of experience from moment to moment (Lutz et al., 2008).

Structure of the Thesis

The main body of the thesis consists of eight chapters in total as follows:

Chapter 1. Introduction;

Chapter 2. Literature Review;

Chapter 3. Study I;

Chapter 4. Study II;

Chapter 5. General Summary and Conclusion

Chapter 2: Literature Review

Traditional Psychological Skills Training

Traditional psychological skills training, also recognized as psychological skills training (PST), was developed by Meichenbaum (1977) more than 40 years ago. As a control / change-based training mold, the PST was mainly based on cognitive-behavioral modification (Meichenbaum, 1977) and social cognitive theory (Bandura, 1977). For decades, the PST has been the primary approach for performance enhancement (Gardner & Moore, 2006). Applied sport psychology has predominately utilized it to help athletes improve athletic performance and achieve ideal performance states (Whelan, Mahoney, & Meyers, 1991).

The foundational assumption of the PST is that negative internal states such as negative thoughts, emotions, and bodily sensations impede performance and that they must be controlled or reduced thereby promoting an increase in positive thinking and self-confidence. Accordingly, the increases in positive internal states will result in ideal performance state allowing the athlete to perform at his or her best (Hardy, Jones, & Gould, 1996). The PST views the attainment of an optimal internal state as necessary for ideal athletic performance (Gardner & Moore, 2012). In order to enhance performance and achieve ideal performance state, the PST primarily focused on developing personal control over one's cognitions, emotional states, and physiological sensations, utilized a series of therapeutic methods / strategies, including imagery, goal setting, mental rehearsal, arousal control, self-talk and pre-competitive routines (Gardner & Moore, 2012).

Over the last 40 years, although the control / change-based PST mold has been predominately applied to enhance athletes' performance in the field of sport psychology, numerous researchers commented on the inconsistent and inconclusive empirical support for the PST's efficacy on performance enhancement (Gould et al., 2002; Weinberg, 2002;

Zaichkowsky & Baltzell, 2001). Improving performance states by the PST is through self-regulatory process and can be accomplished through the methods / strategies listed above (Hardy et al., 1996). Researches continued in PST because of the belief that low levels of anxiety, fewer experiences of negative thinking, and high level of self confidence in athletes are associated with better performance (Orlick & Parington, 1988). Through some correlation studies, it was long accepted that more successful performers are less anxious, more confident, and experience fewer negative thoughts. In fact, it was found in many studies related to the traditional PST that supposed “negative” internal experiences such as thoughts and emotions were successfully reduced, and “positive” states such as confidence were successfully increased. Yet, these studies demonstrated no significant increases in athletic performance despite these changes in internal states (e.g., Burton, 1989; Daw & Burton, 1994; Maynard et al., 1995; Murphy & Woolfolk, 1987). Moreover, it has been demonstrated that ideal performance can occur while experiencing negative internal states (Cohen, Pargman, & Tenenbaum, 2003). This suggests the fundamental assumption of a need to reduce negative internal states is faulty. Moore (2007) performed a qualitative review and concluded that empirical researches on the PST failed to reveal sufficient efficacy on performance enhancement. In addition, Gardner and Moore (2007) suggested that attempts to control cognitive activity lead to increase in self-focused attention rather than task-focused attention and may result in performance dysfunction or an inability to perform learned skills. Studies also demonstrated that attempts at thought suppression can have a paradoxical effect and may actually increase the occurrence and frequency of unwanted thoughts and emotions (Purdon, 1999; Wegner & Zanakos, 1994). Since these potential limitations of the PST have been shown, alternative training approaches to performance enhancement in sports should be considered.

Mindfulness

Mindfulness is defined as the nonjudgmental focus of one's attention on the experience that occurs in the present moment (Kabat-Zinn, 1994). Cottraux (2007) has defined mindfulness as "a mental state resulting from voluntarily focusing one's attention on one's present experience in its sensorial, mental, cognitive and emotional aspects, in a non-judgmental way." Brown and Ryan (2003) have shown that mindfulness is a distinct form of awareness and attention, which could be considered a predisposition for well-being enhancement. Ground in Eastern philosophy, the practice of mindfulness have developed over thousands of years. Recently, the use of mindfulness as a technique has become increasingly popular as a component of therapeutic interventions and has gained empirical support for the treatment of a variety of clinical conditions (Hasker, 2010).

With the prevalence of mindfulness-based interventions, mindfulness is often described as a key aspect of the so-called third wave of behavior therapy (Hayes, 2004). These interventions emphasize changing the function, not the form of behavior, emotion, cognition, bodily sensations and external stimuli. They aim to change the relationship to thoughts and emotions, not the content of thoughts and emotions. This differentiation is an essence of the impact of mindfulness (Birrer, Röthlin, & Morgan, 2012). Mindfulness improves one's attention and increases awareness of the present moment. It is hypothesized that improved attention facilitates the recognition of internal associative process (Carmody, 2009). This recognition leads to the development of re-perceiving (Shapiro, Carlson, Astin, & Freedman, 2006). Re-perceiving is closely related to the concepts of decentering (Safran & Segal, 1990), deautomatization (Deikman, 1982), detachment (Bohart, 1983), and metacognitive awareness (Teasdale, Moore, Hayhurst, Williams, & Segal, 2002). All these concepts describe a change in perception. It is no longer the content (of, e.g., a thought) that is perceived, but the content (of this thought) as an event in / of the mind (Shapiro et al., 2006). This perception is accompanied by the insight that experience consists of components

of thoughts, emotions, and bodily sensations associated with each other. This change in perception and the resulting insight, as meta-mechanism, lead in to various psychological outcomes, such as action flexibility, values clarification, self-regulation, and exposure (Carmody, 2009; Shapiro et al., 2006). Additionally, acceptance is another considered mechanism of action for mindfulness (Hayes et al. 1999). Acceptance stands in contrast to avoidance and control, and can lead to a calmness independent of external circumstances (Birrer et al., 2012). By these mechanisms, mindfulness might beneficially impact psychological adjustment are (1) bare attention, (2) experiential acceptance, (3) values clarification, (4) self-regulation / negative emotion regulation, (5) clarity about one's internal life, (6) exposure, (7) flexibility, (8) non-attachment, and (9) less rumination (Birrer et al., 2012). All these beneficial impacts can be achieved through various mindfulness exercises which are intended to help the individual attend to both external stimuli and internal experiences such as bodily sensations, thoughts, and emotions in a nonjudgmental, nonevaluative way. Internal and external stimuli that enter awareness are carefully observed, but are not perceived as positive or negative. The individual can experience emotions and thoughts as naturally occurring events of human experience, rather than trying to control or reduce them (Teasdale et al., 2002).

To date, frequently utilized mindfulness-based interventions in mainstream / clinical psychology mainly include Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1990), Mindfulness-Based Cognitive Therapy (MBCT; Segal et al., 2002), Acceptance Commitment Therapy (ACT; Hayes et al., 1999), and Dialectical Behavior Therapy (DBT; Linehan, 1993). The former two focus on developing mindfulness skills through meditation-like exercises, and the latter two are treatments incorporating mindfulness procedures into therapy interventions primarily through learning behavioral skills. Through literature review of mindfulness interventions, it was found that mindfulness can be effective on treating pain,

stress, anxiety, depressive relapse, and disordered eating (Baer, 2003). Lau and colleagues (Lau et al., 2006) reviewed areas of treatment in which mindfulness has been utilized with great benefit, including generalized anxiety disorder (Roemer & Orsillo, 2002), posttraumatic stress disorder (Wolfsdorf & Zlotnick, 2001), and substance abuse (Breslin, Zack, & McMain, 2002). Moreover, Brown and Ryan (2003) found that mindfulness is related to increases in self-knowledge and psychological well-being. Further researches have revealed the effectiveness of mindfulness interventions on clinical and non-clinical populations (Baer, 2003).

Mindfulness in Sport

Given the limitations of the traditional PST for athletic performance enhancement, and the rapid development of mindfulness-based interventions in the realm of mainstream / clinical psychology, mindfulness approaches as an exciting alternative to the PST for performance enhancement have been gaining more and more attention in the field of sport psychology (Gardner & Moore, 2006). In 1985, Kabat-Zinn and colleagues used mindfulness meditation training with athletes for performance purposes. That is the first reported application of mindfulness in sports field. Kabat-Zinn et al. (1985) provided training of mindfulness meditation to both collegiate and national team rowers, and reported that collegiate rowers exceeded the coach's expectation based on the athletes' level of experience and physical abilities. Furthermore, several national rowers medaled at the Olympics reported that mindfulness training helped them perform at their full potential. After the promising start, mindfulness training in sports more or less disappeared from the realm of sport psychology for nearly two decades (Birrer et al., 2012). After the period of little quiescence, recently, mindfulness-based training approach has been becoming more and more compelling and vibrant in sport psychology. Especially in the last decade, a series of sport-specific mindfulness-based training programs have been developed and applied in athletes, the

efficacy of these training programs on performance enhancement also has been demonstrated by some empirical studies (Baltzell & Akhtar, 2014; Baltzell, Caraballo, Chipman, & Hayden, 2014; Birrer et al., 2012; Gardner & Moore, 2012).

In sport psychology, mindfulness approaches take an alternative means to traditional PST interventions. Mindfulness training in performance enhancement involves strengthening nonjudgmental awareness and acceptance of in-the-moment cognitive, affective, and sensory experiences (Gardner & Moore, 2004, 2007), and this awareness may be useful to aid performance during competitive situations (Behncke, 2004). Mindfulness practices, seek to “promote a modified relationship with internal experiences... rather than seeking to change them” (Gardner & Moore, 2012, p. 309). In other words, rather than attempt to control or ignore internal process as in PST, individuals are encouraged to acknowledge and accept them as simple events in the ebb and flow of competition (Gardner & Moore, 2007). Mindfulness training ultimately strives to instill a nonjudgmental awareness of such cognitions, acknowledgement, and acceptance in their emergence, and gradually (through extensive practice), the shifting of one’s focus and attention back to the task-at-hand (without actively controlling or changing the thought process). In contrast to the control-based PST of actively controlling thoughts and emotions, mindfulness trainings are geared toward enhancing psychological flexibility (Sappington & Longshore, 2015). Additionally, peak-performance experiences often associate with states of flow (Jackson & Csikszentmihalyi, 1999). Flow state means an individual is deeply involved with the task at hand, and finds the activity inherently enjoyable, that nothing else seems to matter. For athletes, this state can ultimately result in optimal sport performance (Jackson, Thomas, Marsh, & Smethurst, 2001). Numerous studies have demonstrated not only a robust relation between measures of mindfulness and flow in athletes (Bernier et al., 2009), but also significant increase in athletes’ levels of flow after receiving mindfulness-based interventions (Aherne, Moran, &

Lonsdale, 2011).

Up to now, different mindfulness-based trainings have been reported used with athletes in some studies (e.g., Aherne et al., 2011; Baltzell & Akhtar, 2014; Bernier et al., 2009; Gardner & Moore, 2004, 2007; Hasker, 2010). These studies demonstrated the efficacy of mindfulness-based trainings on athletic performance, flow and relevant psychological factors, such as mindfulness ability / level (awareness and attention), experiential acceptance, concentration, sense of control, task-related worries and task irrelevant thoughts. Among all these trainings, Mindfulness-Acceptance-Commitment Approach (MAC; Gardner & Moore, 2007) and Mindful Sports Performance Enhancement (MSPE; Kaufman, Glass, & Arnkoff, 2009) are the main two which have been systematically developed and already got certain empirical support (Birrer et al., 2012). Although some researches have demonstrated the efficacy of sport-specific mindfulness training on athletic performance enhancement, most of them were uncontrolled research or case studies, random controlled trials are still rare (Gardner & Moore, 2012). In addition, based on literature review, there has been little consideration to explore the personal experience of athletes who take mindfulness interventions, in terms of their receptiveness to the training and their perception of the impact of the mindfulness practice on their psycho-emotional sport-related experience (Baltzell & Akhtar, 2014).

Mindfulness and Acceptance-Based Training

In 2001, Moore and Gardner first proposed mindfulness and acceptance-based interventions for the purpose of enhancing athletic performance and overall psychological and general well-being of athletes (Moore & Gardner, 2001). Since then, theoretical and empirical developments have been added to the knowledge base, and have built a scientific foundation for the application of mindfulness and acceptance-based approaches (Gardner & Moore, 2012). Moreover, the first manualized mindfulness and acceptance-based approach

named Mindfulness-Acceptance-Commitment Approach (MAC) was published in 2007 (Gardner & Moore, 2007). MAC is mainly based on Acceptance and Commitment Therapy (ACT; Hayes et al., 1999) and Mindfulness-Based Cognitive Therapy (MBCT; Segal et al., 2002). So far, the MAC, as a flexible 7-module protocol should be the most systematically developed, widely applied, and empirically supported mindfulness-based training in sport psychology.

The primary focus of mindfulness and acceptance-based approaches is to promote a modified relationship with internal experiences (i.e., cognitions, emotions, and physiological sensations), rather than seeking to change their form or frequency (Gardner & Moore, 2007). In direct contrast to the traditional control-based PST viewing the attainment of optimal internal states as necessary for peaking athletic performance, the foundation of mindfulness acceptance-based approaches suggests that optimal performance does not require the reduction or volitional control of internal states at all, but rather, requires (a) a nonjudgmental (i.e., not good or bad, not right or wrong) moment to moment awareness and acceptance of ones' internal states, whatever that may be; (b) an attentional focus on task relevant external stimuli, instead of a focus on internal processes that include judgment and direct efforts at control / modulation; and (c) a consistent and effortful personal values-driven commitment to behavioral actions / choices that support one's athletic endeavor (Gardner & Moore, 2012). Mindfulness and acceptance-base approaches help individuals develop a different relationship with their internal experiences through meditative and other experiential exercises, rather than emphasizing control or reduction of internal experiences.

Since its inception in 2001, a series of studies have demonstrated the efficacy of MAC and closely related interventions for athletic performance enhancement and overall well-being (Gardner & Moore, 2004, 2012). These studies have demonstrated increases in mindfulness awareness and attention, experiential acceptance, flow, as well as competitive

performance or self and coaching rating performance (Hasker, 2010; Gardner & Moore, 2004, 2007; Lutkenhouse, 2007; Schwanhausser, 2009). Nevertheless, studies on the MAC have same research gaps as studies on other mindfulness-based trainings. Literature reviews found that random controlled trails to demonstrate the efficacy of MAC are rare (Gardner & Moore, 2012). Moreover, none studies, exploring the personal experience of athletes who take the MAC training in terms of their receptiveness to the training and their perception of the impact of the mindfulness practice on their psycho-emotional sport-related experience, has been done.

Mindfulness-Acceptance-Insight-Commitment Program

Mindfulness, the core conception of mindfulness and acceptance-based training, derived from Eastern religion of Buddhism and philosophy (Si, Lo, & Zhang, 2016; Si et al., 2014), has been widely applied by Western scholars in mainstream psychology and sport psychology (Birrer et al., 2012). In recent years, along with the prevalence and success of mindfulness used by Western psychologists, mindfulness-based trainings start to arrest attention of Chinese scholars (Si et al., 2016). Mindfulness-Acceptance-Insight-Commitment Training program (MAIC) is a sport-specific mindfulness and acceptance-based training developed by the researcher and colleagues specialized for Chinese athletes. Moreover, the manualized MAIC has been published as a manual book in 2014 (Si et al., 2014).

Since Kabat-Zinn and colleagues (1985) first applied mindfulness in the field of sport psychology, it has been nearly four decades. Over the past decades, a certain number of mindfulness-based trainings have been developed and applied by Western sport psychologists, even several of them are significant such as the MAC (Gardner & Moore, 2007) and the MSPE (Kaufman et al., 2009). However, all these mindfulness-based trainings are designed for athletes in Western culture background, for better compatibility, indigenous culture factors should be considered when designing the mindfulness-based training for

athletes from different cultural backgrounds (Si et al., 2016). The MAIC is based on the existing MAC protocol (Gardner & Moore, 2007), meanwhile, integrated the concept “insight” of Chinese Zen Buddhism, and the local sport psychologist Si’s acceptance-based adversity coping model (Si, 2006). Insight has been defined as “a direct, non-conceptual understanding achieved through the repeated examination of the three characteristics in the objects of meditation” (Grabovac, Lau, & Willett, 2011, p. 159). In Chinese culture background, the researchers define insight as a new awareness or discovery of life, and its manifestation can be observed when individuals establish a new understanding of their meaning of life and personal values. The significance of insight can be seen as one’s commitment to, and immersion in the current task via detachment, that means detaching oneself from obsession in order to reach nonattachment (a release from mental fixation) and coming to know the authentic heart (Si et al., 2016). Acceptance-based adversity coping model aligns with the principle of Chinese Zen Buddhism, it emphasizes the relationship between mental states and behavior can vary depending on how successfully athletes are able to accept and coexist with adversities (Si, Lee, & Lonsdale, 2010). Si (2006) emphasized that peak performance was not about performing perfectly, but rather coping with adversities effectively through accepting and learning to coexist with them. According to Si (2006), adversity in competition should be viewed as normal, and athletes’ successful performances are closely related to their ability to cope with adverse situations. One’s attitude toward adversity is a key factor affecting performance, acceptance-based adversity coping advocates training acceptance instead of training athletes to control or change mental states (Si et al., 2016).

As a manualized mindfulness and acceptance-based training for enhancement of athletes’ performance and overall wellbeing, the MAIC mainly consists of seven parts, including (a) Introduction and psycho-education of the MAIC, (b) Mindfulness, (c):

Decentering, (d) Acceptance, (e) Values and insight, (f) Commitment, and (g) Comprehensive review and consolidation (Si et al., 2014). Currently, the MAIC has been applied in a few studies, and the results suggested the increases of athletes' mindfulness and acceptance levels, and athletic performance enhancement (e.g., Bu & Si, 2014; Si et al., 2016). However, these extant studies applying MAIC were still constrained in case studies, more random controlled trials are needed to further demonstrate the efficacy of MAIC on athletes' performance and overall wellbeing. In fact, researches on mindfulness-based training for Chinese athletes are still inchoate (Huang & Su, 2017). Moreover, literature review found there is still no published studies reported using mindfulness-based training with elite athletes in Hong Kong. In Hong Kong, elite adolescent athletes not only face the challenges from sport life (e.g., training and competition), but also face the challenges from normal life (e.g., academic studying) (Cheung & Chiu, 2016). Therefore, providing HK elite adolescent athletes with a mindfulness-based training to enhance their athletic performance and overall wellbeing should be necessary and significant. Moreover, the MAIC should be a good choice. Through research on using the MAIC with HK elite adolescent athletes, the efficacy of the MAIC can be further testified. In addition, some researchers have denoted that the mindfulness-based trainings should be more understandable and "user-friendly" for different population (Baltzell & Akhtar, 2014). Through exploring the experience of the HK elite adolescent athletes who take the MAIC training, in terms of their receptiveness to the training and their perception of the impact of mindfulness and acceptance practice on their psycho-emotional sport related experience, the results may provide relevant helpful suggestions to revise the MAIC to be a better edition for HK adolescent athletes.

Chapter 3: Study I

Methodology

The purpose of study I was to use a single-case design study to do a preliminary examination on the effectiveness of MAIC program in Hong Kong elite adolescent athletes on the single-case basis as a pilot study for study II. The ethical approval was obtained from the Human Research Ethics Committee of the Education University of Hong Kong (EdUHK) before carrying out the research.

Participants

In the study I, four adolescent athletes, who were aged from 14 to 19, were recruited from elite Billiard team of the Hong Kong Sports Institute (HKSI). These four athletes aged from 14 to 19 ($M_{\text{age}} = 15.50$, $SD_{\text{age}} = 1.53$; females = 1, males = 3), training at the HKSI as scholarship athletes no less than 2 years, first exposed to mindfulness-based training. Before the study I starting, informed consent was got from relevant coaches, athletes and their parents or legal guardians. All athletes were voluntary to participate in this study, and they were clearly informed that they have the right to withdraw from the study at any time and the confidentiality and anonymity of their data would be assured and respected.

Design and procedure

A multiple-baseline single case design was employed in the study I that lasted seven weeks including three phases: (1) The baseline phase, in which self-reported measures (mindfulness, acceptance, satisfaction, performance) were conducted at four data points over two-week period (i.e., twice a week) for all four athletes. MAIC training started immediately after this phase; (2) The intervention phase, in which the MAIC training program was completed by all four athletes in three-week period, meanwhile, data collection was conducted for all four athletes at six data points (i.e., twice a week); (3) The post-intervention phase, which was conducted in the following two weeks after intervention phase, and four

data points (i.e., twice a week) were used to collect the data in this phase.

Intervention and measures

The content of MAIC training program for the study I please see appendix B.

Mindfulness:

Athlete Mindfulness Questionnaire (AMQ; Zhang, Chung, & Si, 2017). The AMQ is a 16-item questionnaire measuring athletes' levels of mindfulness during training and competition from three dimensions: (a) present-moment attention, (b) awareness and (c) acceptance. Items are rated on a five-point Likert scale ranging from 1 (never true) to 5 (always true). Subscale scores for each dimension can be calculated, and a high composite score on all dimensions indicates a high level of mindfulness. The internal consistent reliabilities of the present-moment attention ($\rho = .75$), awareness ($\rho = .76$), and acceptance ($\rho = .64$).

Acceptance:

Chinese Version of Acceptance and Action Questionnaire-II (CV-AAQ II; Zhang, Chung, Si, & Liu, 2014) is a seven-item single-dimensional self-report questionnaire to measure one's levels of experiential avoidance and psychological inflexibility (the opposite of psychological flexibility). Items are rated on a seven-point Likert scale ranging from 1 (never true) to 7 (always true), with low scores indicating a low level of experience avoidance and psychological inflexibility (i.e. high level of acceptance). The Chinese version of the AAQ-II demonstrated a high level of internal consistency and reliability in two samples of Chinese college students (composite reliability: $\rho = 0.89$ and $\rho = 0.88$) and a sample of elite Chinese athletes ($\rho = 0.85$).

Performance-related experience:

Satisfaction. The 6-item Training and Competition Satisfaction Scale (TCSS; Zhang & Liang, 2002) was used to assess athletes' satisfaction in their training or competition. All

items are rated on 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The internal consistency of the TCWS is $\alpha = .75$. High scores indicate high training or competition satisfaction.

Direct performance:

Coach-Rating Performance Scale & Athlete Self-Rating performance Scale (CRPS & ARPS). Based on performance criteria of different sports and relevant studies (e.g., Liu et al., 2016; Si et al., 2016), after discussing with the researcher's supervisors and relevant coaches involved in this research, the Coach-rating Performance Scale and the Athlete Self-rating Performance Scale were developed to assess athletes' performance. Both CRPS and ARPS consisted of three facets, including (a) training commitment, (b) movement qualities, and (c) movement stability. Some sub-aspects were considered to be included in these three facets, for example, training attendance and training duration were included in facet (a), movement accuracy and movement difficulty were included in facet (b), error times and completing percentage of the required actions were included in facet (c). The CRPS was rated by relevant coaches on a 10-point Likert scale ranging from 1 (worst) to 10 (best). The ARPS was rated by the athletes on a 10-point Likert scale ranging from 1 (worst) to 10 (best). Both CRPS' and ARPS' scores were acquired by summing the scores of three facets.

Data Analysis

The data collected from the study I were analyzed by Visual Analysis and Non-Overlap of All Pairs (NAP; Parker, Vannest & Davis, 2011). NAP is an index of data overlap between phases in single-case designed studies, and it can be interpreted as the percentage of the improving pairs out of all pairs across phases A and B (Parker et al., 2011). The NAP could be calculated by the computer or hand-calculation (detailed calculation methods please refer to Parker & Vannest, 2009). The NAP scores typically range .50 to 1.00. The scores lying between .00 to .49 indicates there is deterioration. When the original scores are over or equal

to .05, the NAP needs to be rescaled to guarantee the scores range .00 to 1.00 for effect size calculation. For the criteria of the effect size of the rescaled NAP, .00 - .31 indicates weak effects, .32 - .84 indicates medium effects, and .85 - 1.00 indicates large or strong effects (Parker & Vannest, 2009).

Results of Study I

All the data collected from the 14 data points in total in the study I were analyzed through Visual Analysis and Non-Overlap of All Pairs (NAP).

Mindfulness

Through Visual and NAP analyses, variation of mindfulness about four athletes were analyzed and presented in Figures 4.1 to 4.4.

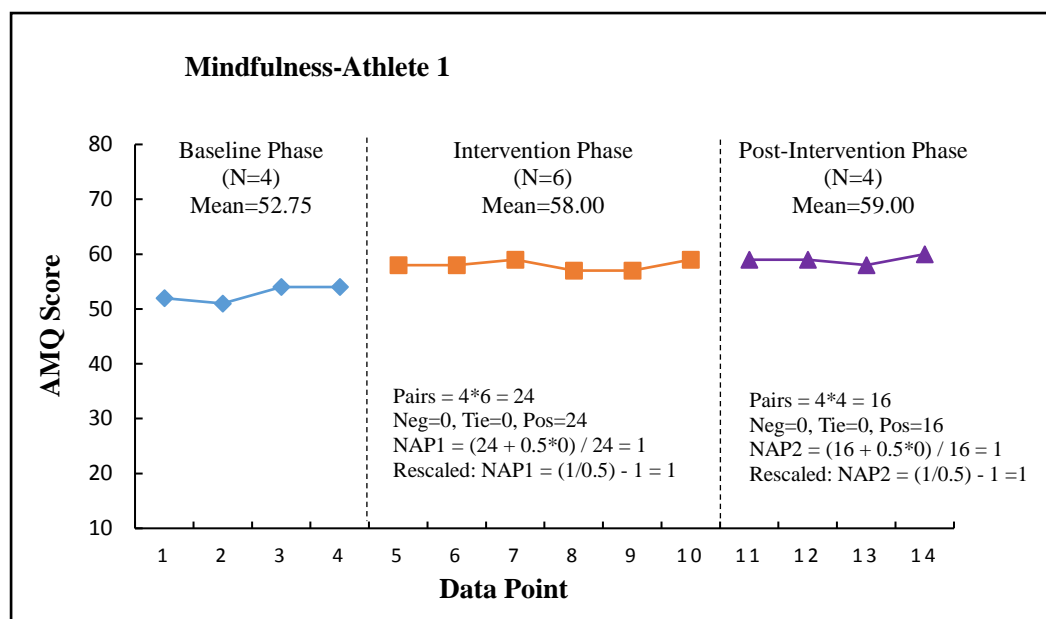


Figure 4.1. Mindfulness Variation for Participant 1

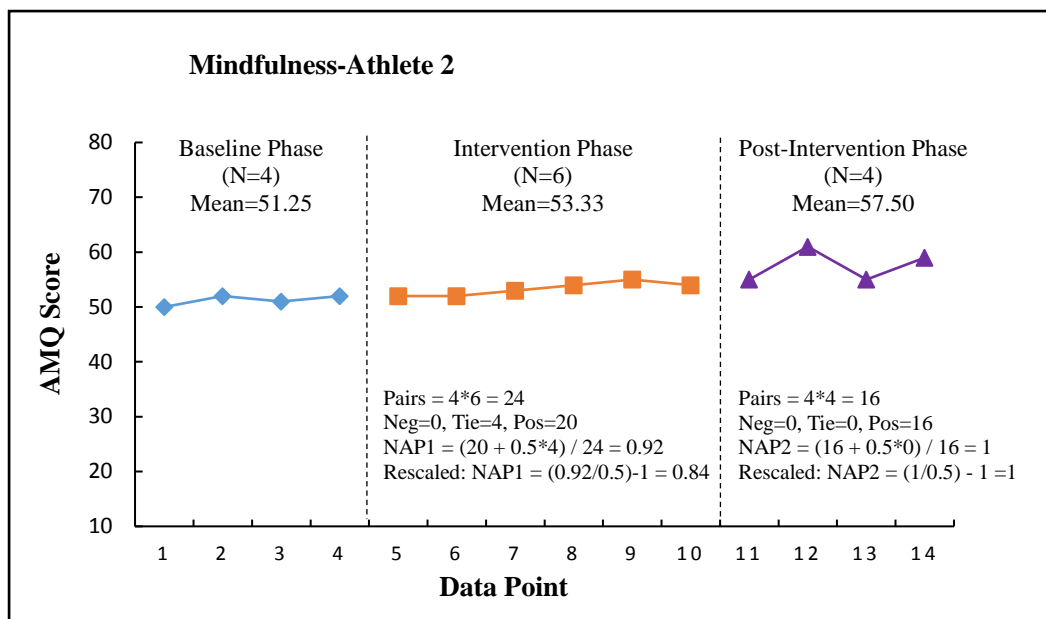


Figure 4.2. Mindfulness Variation for Participant 2

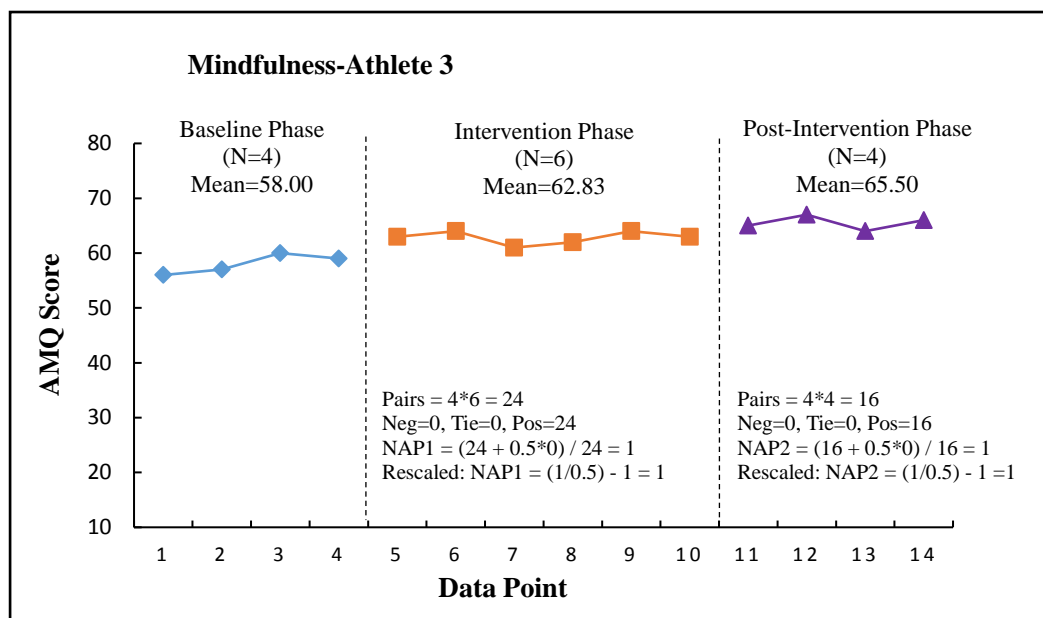


Figure 4.3. Mindfulness Variation for Participant 3

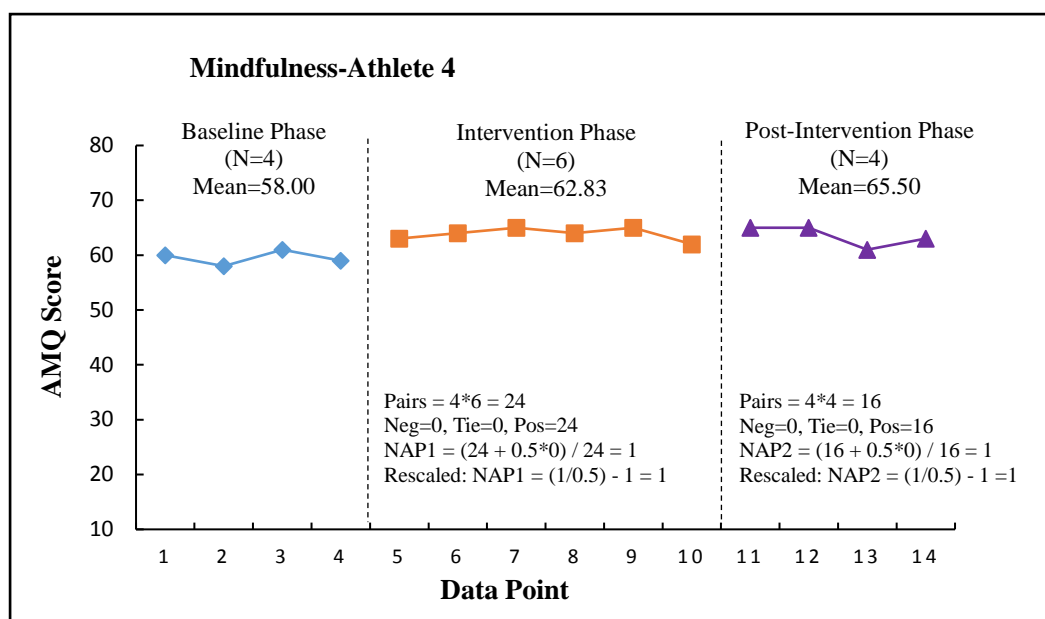


Figure 4.4. Mindfulness Variation for Participant 4

In Figures 4.1 to 4.4, for all four athletes, the variation of AMQ scores can be observed in both the intervention phase and the post-intervention phase compared to the baseline phase. The mean scores of AMQ of all four athletes in both the intervention phase and the post-intervention phase were obviously higher than that in the baseline phase. This variation of the mean scores of AMQ implied that the MAIC training had effectiveness on overall improvement in mindfulness for all four athletes. Moreover, the rescaled NAP1 values of all four athletes in the intervention phase were 1, 0.84, 1, and 1, respectively. The rescaled NAP1 values indicated that the MAIC training had strong effects in the intervention phase for athletes 1, 3 and 4, and medium effect for athlete 2 as well. In the post-intervention phase, the NAP2 values of four athletes all were 1, indicating the MAIC training had strong effects for all athletes. In summary, the MAIC training demonstrated strong and medium effects for three and one athletes in improving overall levels of their mindfulness during the intervention phase, respectively. Additionally, the effects of the MAIC training well remained for all four athletes in the post-intervention phase.

Acceptance

Through Visual and NAP analyses, variation of acceptance about four athletes were analyzed and presented in Figures 4.5 to 4.8.

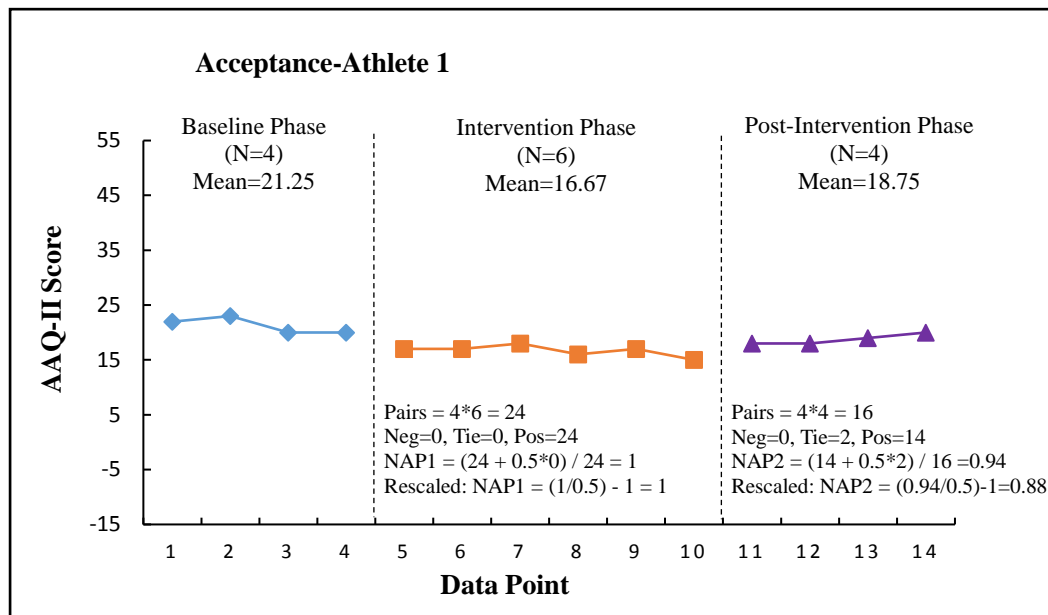


Figure 4.5. Acceptance Variation for Participant 1

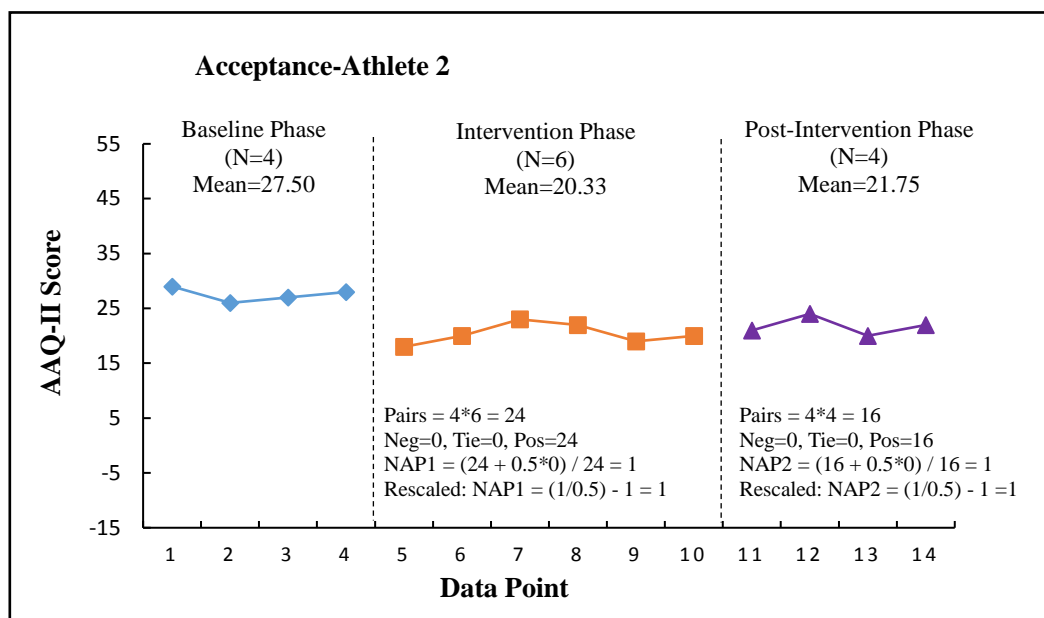


Figure 4.6. Acceptance Variation for Participant 2

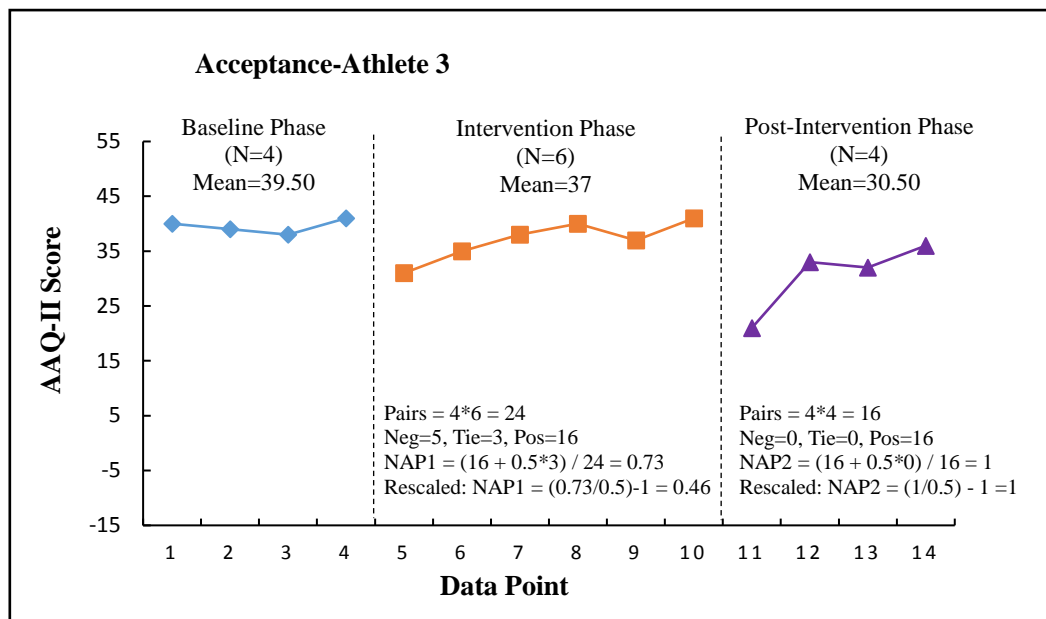


Figure 4.7. Acceptance Variation for Participant 3

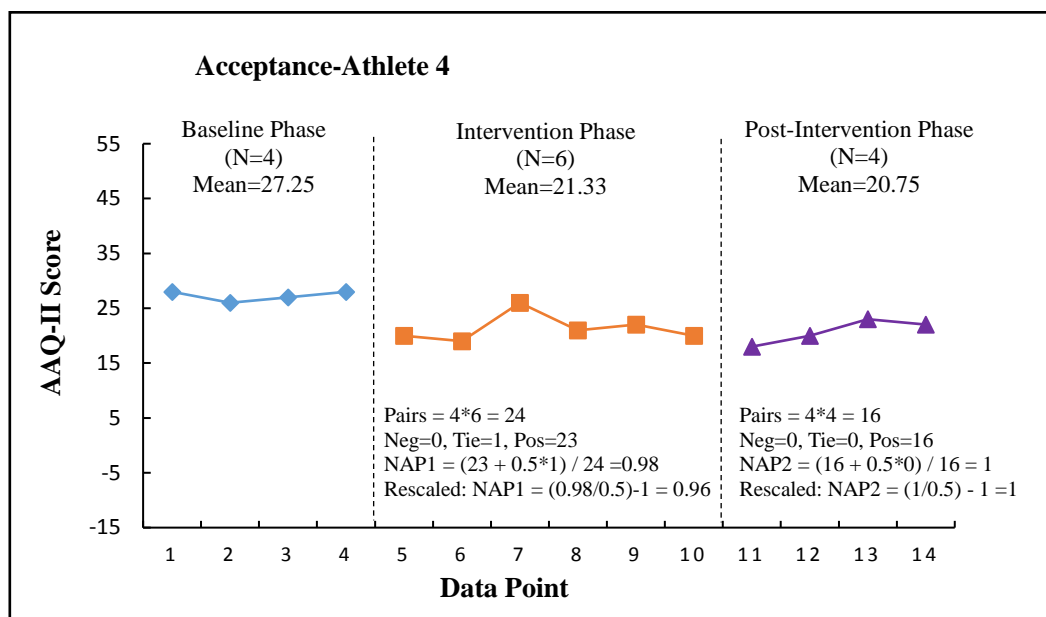


Figure 4.8. Acceptance Variation for Participant 4

In Figures 4.8 to 4.4, through visual inspection, the variation of AAQ-II scores for all four athletes can be viewed in both the intervention phase and the post-intervention phase compared to the baseline phase. The mean scores of AAQ-II of all four athletes in both the

intervention phase and the post-intervention phase were obviously lower than that in the baseline phase. Overall decrease in experiential avoidance can be found through this change of the mean scores of AAQ-II that implied the MAIC training was effective on improving athletes' experiential acceptance. In addition, the rescaled NAP1 values in the intervention phase were 1, 1, 0.46, and 0.96 for four athletes, respectively. These rescaled NAP1 values indicated that the MAIC training had strong effects in the intervention phase for athletes 1, 2 and 4, and medium effect for athlete 3 as well. The NAP2 values for four athletes were 0.88, 1, 1, and 1 in the post-intervention phase, respectively. These NAP2 values indicated that the MAIC training had strong effects for all four athletes in the post-intervention phase. In summary, the MAIC training had strong effects on improving experiential acceptance for three out of four athletes, and also had medium effect for the left one during the intervention phase. In the post-intervention phase, strong effects of the MAIC training on experiential acceptance were maintained for three athletes (1, 2, and 4), and the effect for athlete 3 was strengthened.

Satisfaction

Through Visual and NAP analyses, variation of performance-related satisfaction about four athletes were analyzed and presented in Figures 4.9 to 4.12.

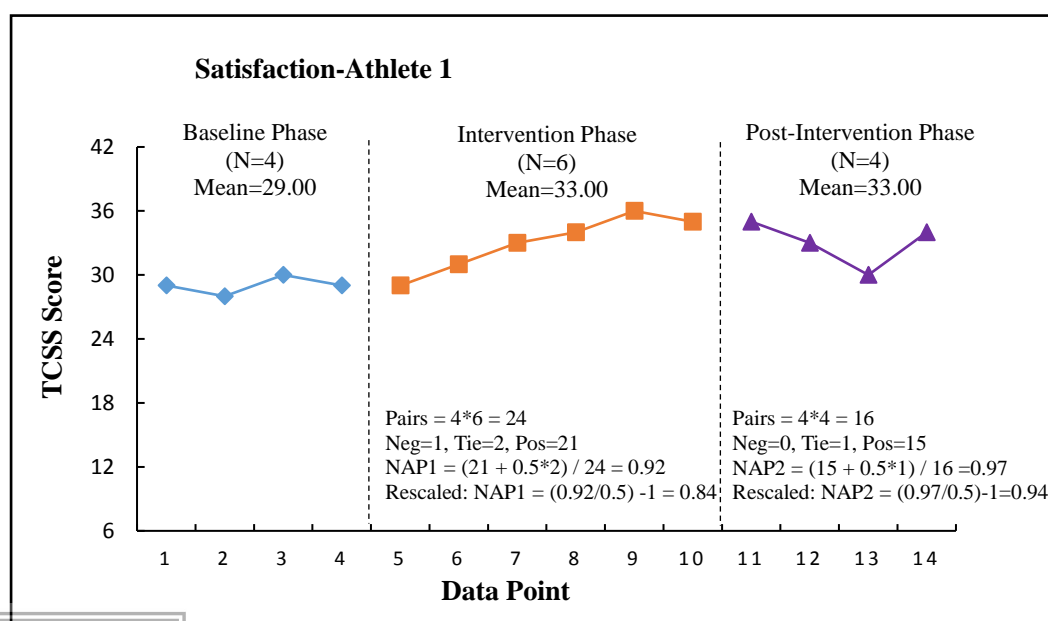


Figure 4.9. Satisfaction Variation for Participant 1

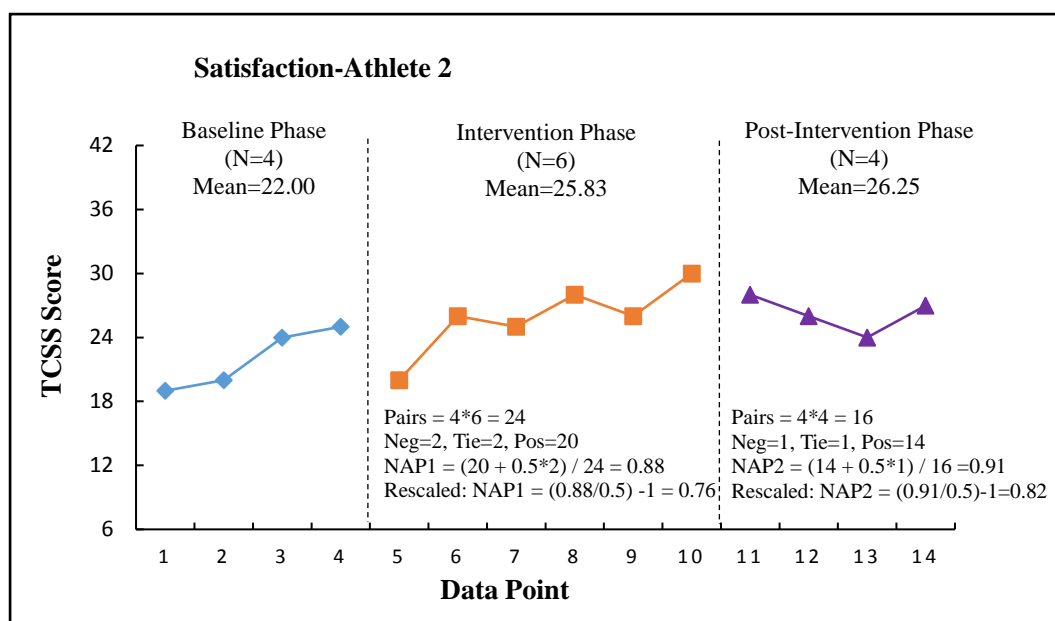


Figure 4.10. Satisfaction Variation for Participant 2

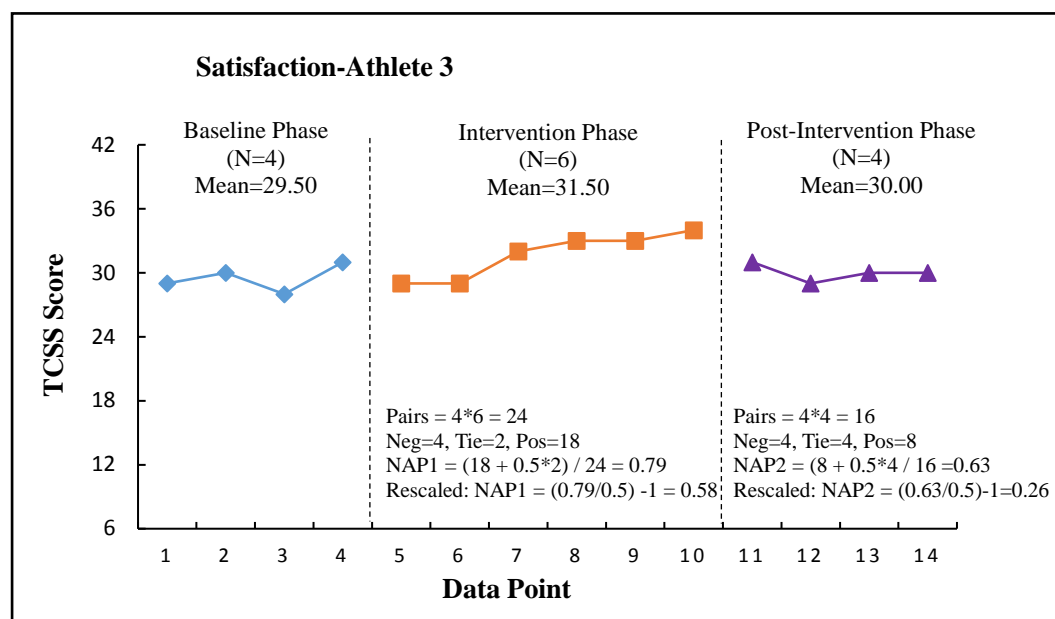


Figure 4.11. Satisfaction Variation for Participant 3

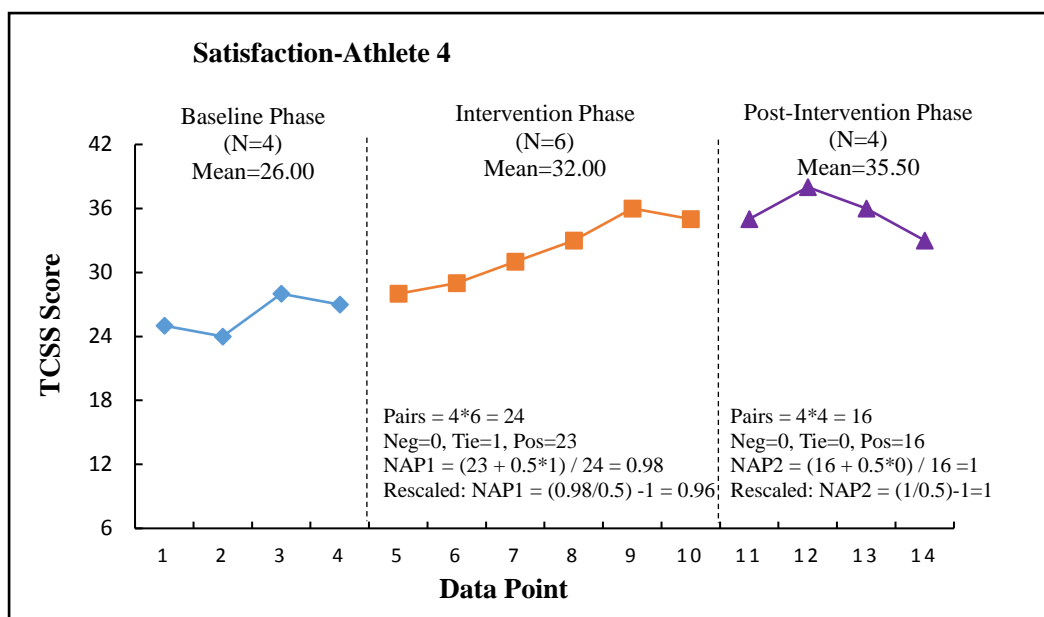


Figure 4.12. Satisfaction Variation for Participant 4

The visual inspection in Figures 4.9 to Figures 4.12 indicated the variation of TCSS scores for all four athletes. The mean scores of TCSS of all four athletes in the intervention phase were obviously higher compared to that in the baseline phase. In the post-intervention phase, except athlete 3 whose mean score was just 0.50 higher compared to that in the baseline phase, the other three athletes' mean scores were also obviously higher than that in the baseline phase. The changes of the mean scores of TCSS of four athletes implied that the MAIC training had an effect on the overall enhancement of the athletes' satisfaction with training and competition. By the NAP analyses, the rescaled NAP1 values of four athletes in the intervention phase were 0.84, 0.76, 0.58, and 0.96, respectively, indicating that the MAIC training had strong effect for athlete 4, and medium effects for athletes 1, 2 and 3. In the post-intervention phase, the rescaled NAP2 values for four athletes were 0.94, 0.82, 0.26 and 1, respectively, indicating that the MAIC training had strong effects for athletes 1, 4, medium effect for athlete 2, and weak effect for athlete 3. In summary, the MAIC training had medium effects on enhancing athletes' performance-related satisfaction with training for three

out of four athletes in the intervention phase, and had strong effect for the left one. In the post-intervention phase, the effect of the MAIC training was maintained for two athletes (2, 4) and strengthened for athlete 1 (medium to strong). However, the effect for athlete 3 became weaker than that in the intervention phase (medium to weak), but still existed.

Coach-Rating Performance

Through Visual and NAP analyses, variation of coach-rating performance about four athletes were analyzed and presented in Figures 4.13 to 4.16.

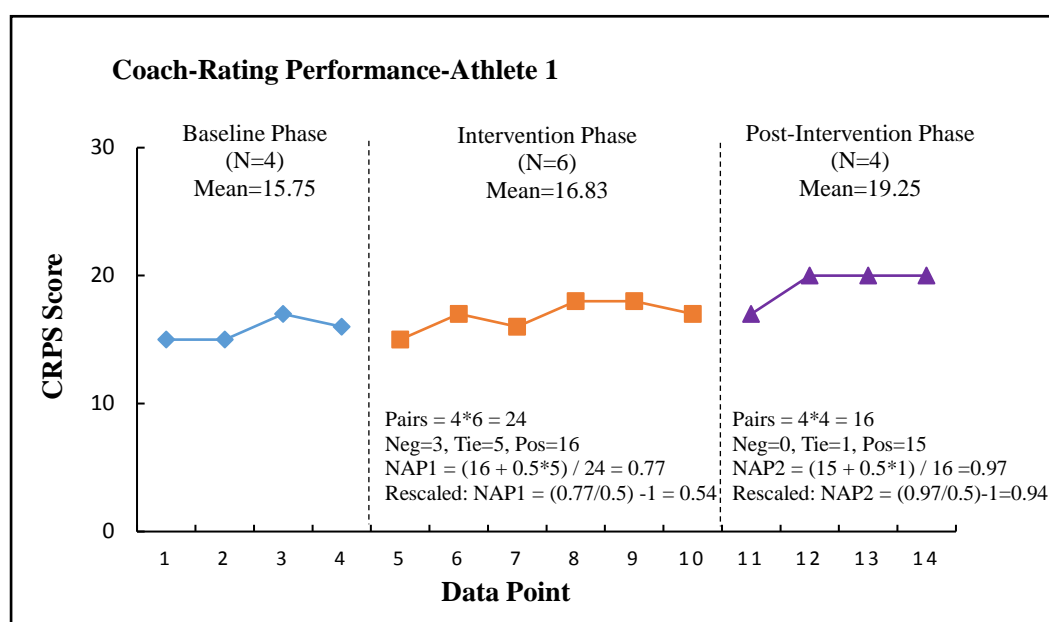


Figure 4.13. Coach-Rating Performance Variation for Participant 1

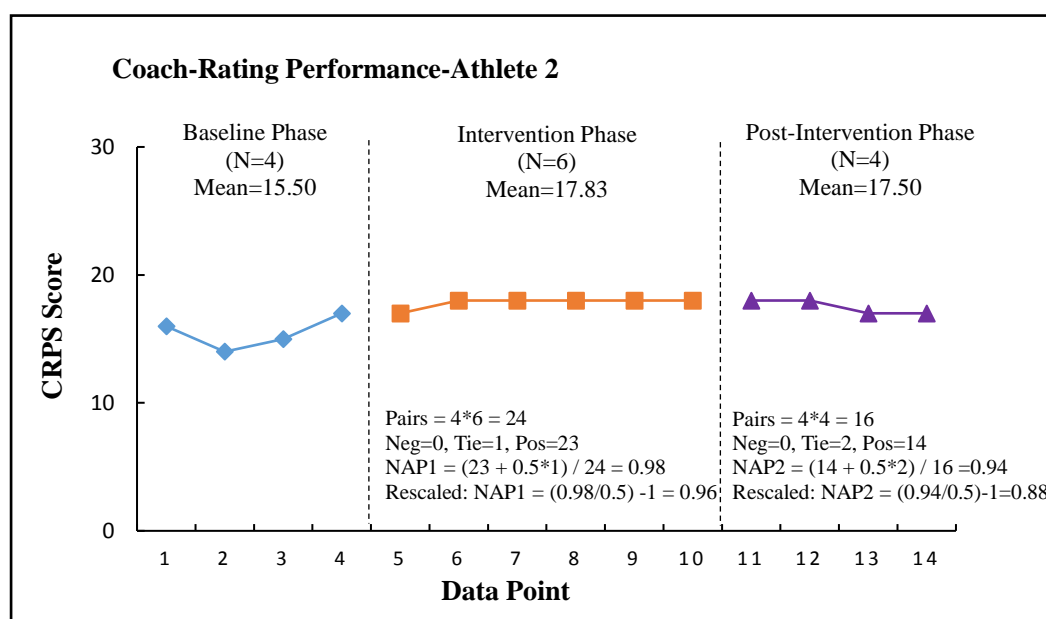


Figure 4.14. Coach-Rating Performance Variation for Participant 2

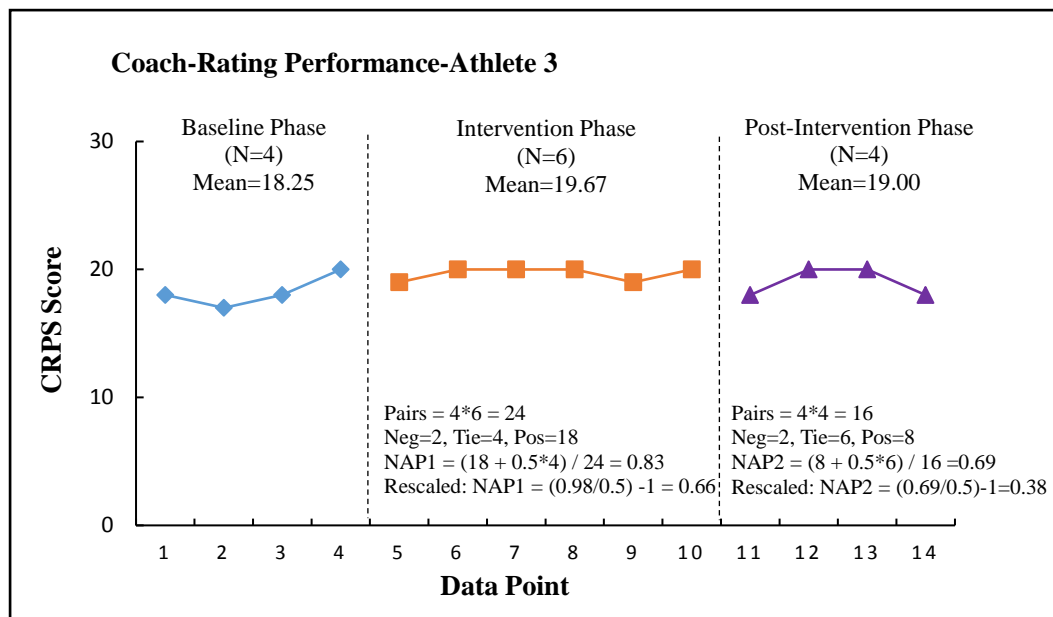


Figure 4.15. Coach-Rating Performance Variation for Participant 3

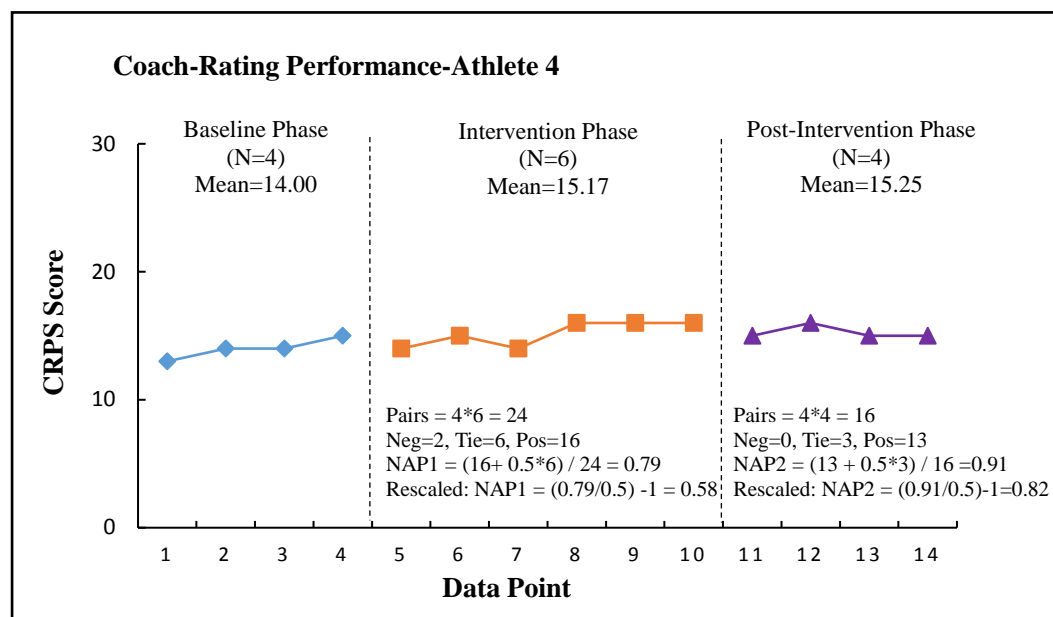


Figure 4.16. Coach-Rating Performance Variation for Participant 4

Through the visual inspection, in Figures 4.13 to 4.16, the variation of CRPS scores for all four athletes can be viewed in both the intervention phase and the post-intervention phase

compared to the baseline phase. The mean scores of CRPS of three out of four athletes (1, 2, and 4) in both the intervention phase and the post-intervention phase were obviously higher than that in the baseline phase. For athlete 3, the mean score of CRPS in the intervention phase was obviously higher compared to that in the baseline phase. Even it in the post-intervention phase was not very obviously higher than that in the baseline phase, it was still 0.75 higher. This change of the mean scores of CRPS implied the MAIC training was effective on athletes' performance enhancement. By the NAP analyses, the rescaled NAP1 values of four athletes were 0.54, 0.96, 0.66, and 0.58, respectively, indicating that the MAIC training had strong effect for athlete 2 and medium effects for athletes 1, 3, and 4 in the intervention phase. The rescaled NAP2 values in the post-intervention phase for four athletes were 0.94, 0.88, 0.38, and 0.82, respectively, indicating that the MAIC training had strong effects for athletes 1 and 2, and medium effects for athletes 3 and 4. In summary, the MAIC training had strong effect for one athlete on coach-rated performance enhancement, and medium effects the others in the intervention phase. In the post-intervention phase, the effect of the MAIC training on coach-rated performance enhancement was maintained for three athletes (2, 3, and 4), and strengthened for athlete 1 (medium to strong).

Athlete Self-Rating Performance

Through Visual and NAP analyses, variation of athlete self-rating performance about four athletes were analyzed and presented in Figures 4.17 to 4.20.

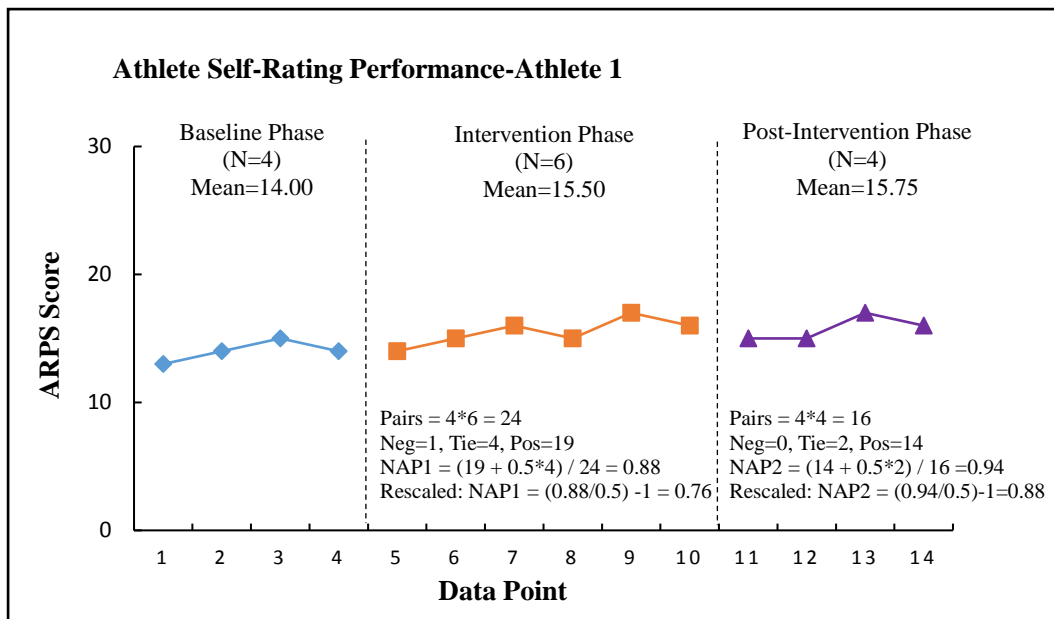


Figure 4.17. Athlete Self-Rating Performance Variation for Participant 1

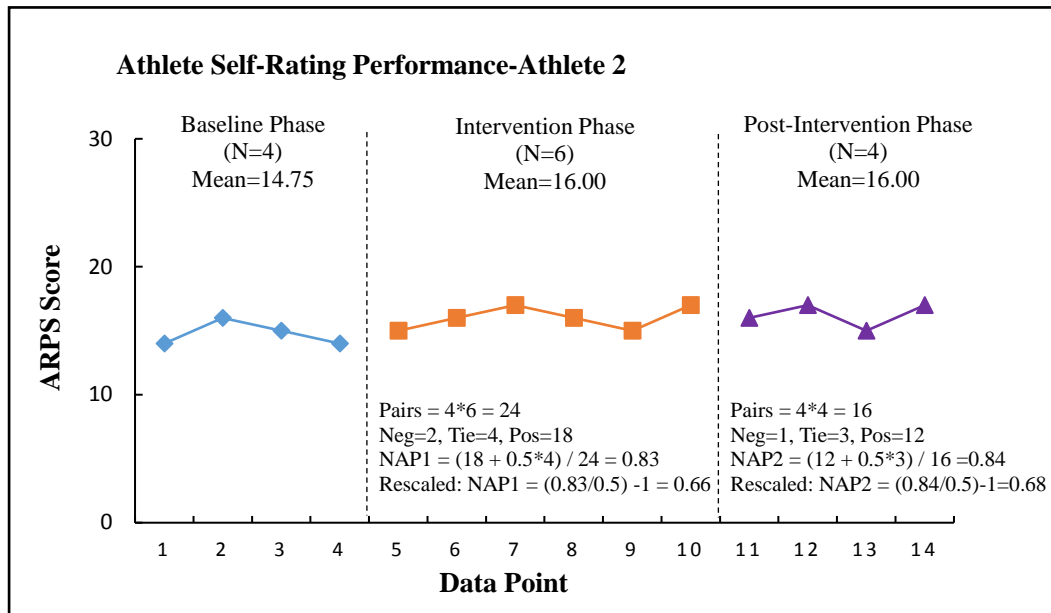


Figure 4.18. Athlete Self-Rating Performance Variation for Participant 2

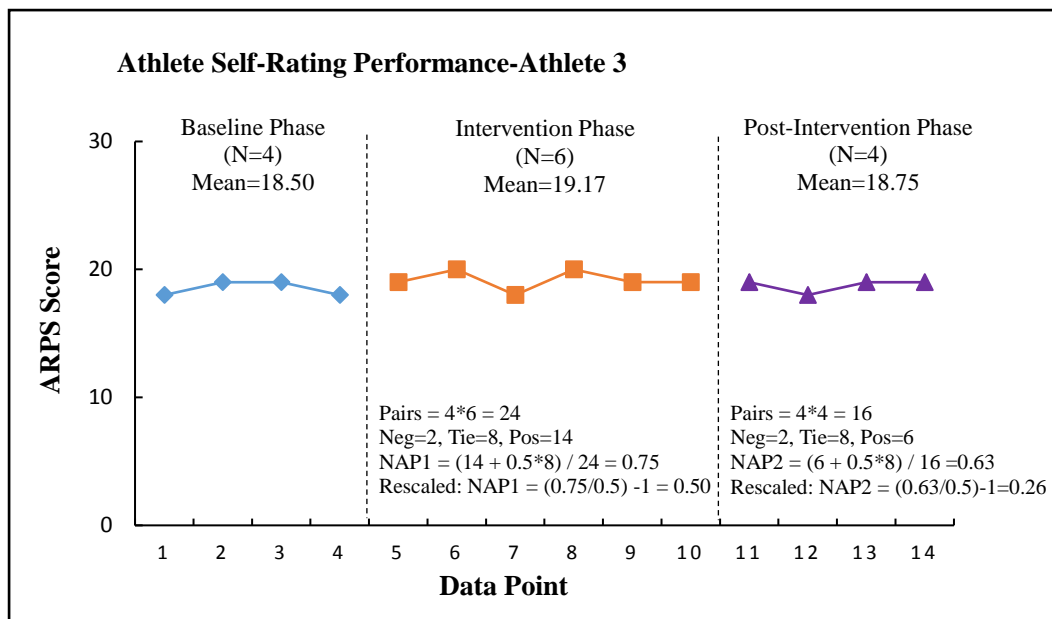


Figure 4.19. Athlete Self-Rating Performance Variation for Participant 3

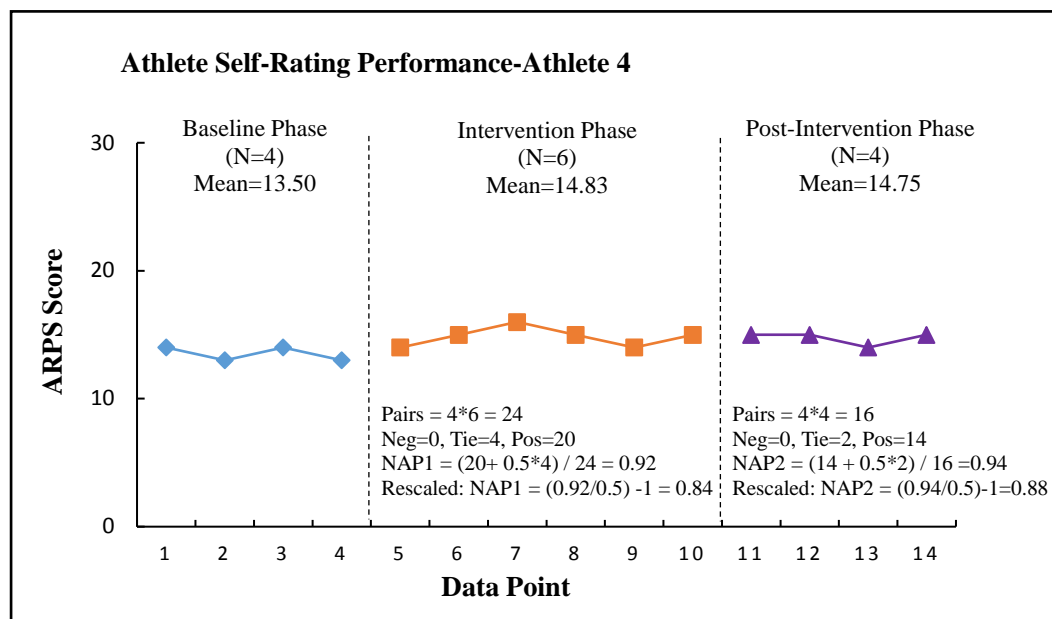


Figure 4.20. Athlete Self-Rating Performance Variation for Participant 4

Through the visual inspection, in Figures 4.17 to 4.20, the variation of ARPS scores for all four athletes can be viewed in both the intervention phase and the post-intervention phase compared to the baseline phase. The mean scores of the ARPS for three out of four athletes (1, 2, and 4) in both the intervention phase and the post-intervention phase were obviously

higher compared to that in the baseline phase. The mean scores of the ARPS for athlete 3 in both the intervention phase and the post-intervention phase were increased, compared to that in the baseline phase. However, the variations were slight. By the NAP analyses, the rescaled NAP1 values, in the intervention phase, for four athletes were 0.76, 0.66, 0.50, and 0.84 respectively, indicating that the MAIC training had medium effects for all four athletes. In the post-intervention phase, the rescaled NAP2 values for four athletes were 0.88, 0.68, 0.26, and 0.88, respectively, indicating that the MAIC training had strong effects for athletes 1 and 4, medium effect for athlete 2, and weak effect for athlete 3. In summary, the MAIC training had medium effects for all four athletes on self-rated training performance enhancement in the intervention phase. In the post-intervention phase, the effect of the MAIC training on self-rated training performance enhancement was maintained for athlete 2, and strengthened for athlete 1 and 4 (medium to strong). However, the effect for athlete 3 on self-rated training performance enhancement was becoming weaker in the post-intervention phase compared to the intervention phase (medium to weak).

Discussion for Study I

The aim of the study I was to preliminarily examine the effectiveness of the MAIC program on four Hong Kong elite adolescent athletes, in terms of mindfulness, acceptance, sport training performance, and performance-related satisfaction. The results of this study showed the MAIC training program had medium or strong effect on mindfulness, acceptance and coach-rating performance for all four athletes in both the intervention phase and the post-intervention phase, and the effect was well maintained or strengthened in the post-intervention phase.

The Effects of the MAIC Training Program

Regarding athlete self-rating performance and performance-related satisfaction, medium or strong effect of the MAIC training program for all four athletes in the intervention phase

could also be found from the results. However, the effect only well maintained or strengthened for three out of four athletes in the post-intervention phase. For on athlete, athlete 3, the effects on both athlete self-rating training performance and performance-related satisfaction were down to weak in the post-intervention phase. Nonetheless, one possible explanation for the effect weakened for athlete 3 could be considered that relative high self-rating performance scores had achieved by athlete 3 as an adolescent athlete in the baseline phase, and that made it hard for the athlete to improve it much in both the intervention phase and the post-intervention phase. Moreover, the variation of athlete 3's self-rating performance scores could also be found consistent with the coach-rating performance scores. Therefore, it could be understandable why the athlete 3 was not so satisfied with the performance improvement in the post-intervention phase.

Although the improvement for athlete 3's sport training performance and satisfaction in the post-intervention phase was not so much, it also got enhanced. Meanwhile, the results showed obvious improvement in mindfulness, acceptance for athlete 3 in both the intervention phase and the post-intervention phase. Except athlete 3, the result also showed obvious improvement in mindfulness, acceptance, performance, and performance-related satisfaction for all the rest athletes in both the intervention phase and the post-intervention phase. Generally, the study I preliminarily supported the effectiveness of the MAIC training program on the athletes' mindfulness, acceptance, sport training performance and performance-related satisfaction.

In the Line with the Existing Studies

The findings of study I were in the line with the existing studies (e.g., Bu, 2015; Bu & Si, 2014; Si et al., 2016; Liu et al., 2016; Zhang, Si, Duan, Lyu, Keatley, & Chan, 2016) that applied the MAIC training program. The MAIC training as a mindfulness and acceptance-based training approach developed specifically for Chinese athletes (Si et al., 2014), since its

inception, has been applied in studies with elite athletes from different sports of Mainland China including tennis, free combat, synchronized swimming, and wushu (e.g., Bu, 2015; Bu & Si, 2014; Si et al., 2016; Liu et al., 2016). These studies also supported the effectiveness of the MAIC training program on athletes' psycho-emotional experience (e.g., mindfulness, acceptance, attention, and flow) and sport related experience (e.g., behavior commitment and performance enhancement). However, the studies which applied the MAIC training program with elite athletes are still limited. Up to now, the number of studies applying the MAIC training program that have been published is only four. Moreover, all these studies are case or single-case designed studies (i.e., Bu, 2015; Bu & Si, 2014; Si et al., 2016; Liu et al., 2016). There is only one study (Zhang et al., 2016) that applied the MAIC training program was randomized controlled trials (RCT). Although this study with RCT also supported the effectiveness of the MAIC training program, the participants in this study were collegiate students recruited from a sport university in China, rather than elite athletes.

Further Evaluation on the Effects of the MAIC Needs More RCT Studies

Case studies and single-case designed studies are valuable and important ways to evaluate the effectiveness of interventions, especially when it is at the early development stage of a new intervention / training approach (Gardner & Moore, 2012). However, getting supportive evidences from case or single-case designed studies is just the initial step in the process to evaluate the effectiveness of the MAIC training. To further testify whether the MAIC is well established, and facilitate its further development and promotion, more RCT studies with large sample size of Chinese elite athletes are needed and necessary. In addition, the MAIC training integrated with indigenous Chinese socio-cultural elements (e.g., acceptance-based adversity coping, social-oriented values, and insight) is specifically developed for Chinese athletes (Su, Si, & Zhang, 2019), but all of the currently existing studies that applied the MAIC training program were conducted with athletes only from

Mainland China. There is still no studies to apply the MAIC training program within Chinese elite athletes from Hong Kong, and also no studies to apply the MAIC specifically within elite adolescent athletes.

The Need of In-depth Understanding of the Athletes' Experiences towards the MAIC

Through literature review, it is obvious that more and more studies that applied the mindfulness and acceptance-based training approaches with athletes have been emerging in the field of Western sport psychology. However, only a few studies have explored athletes' experience of taking part in a mindfulness and acceptance-based training (e.g., Baltzell, Chipman, Hayden, & Bowman, 2015; Cote, Baltzell, & Diehl, 2019). In Chinese sport psychology, although more and more attention has been caught by the mindfulness and acceptance-based training approaches, there is even no studies to specifically explore the experience of athletes that received training based on mindfulness and acceptance. Same situation, the currently existing studies that applied the MAIC training with Chinese athletes all were to examine the effectiveness of the training, and there is still no studies aiming to explore athletes' experience related to participating in the MAIC training.

Given all the above discussion, it is easy to find that there are still some limitations in the currently existing studies that applied the MAIC training related to the population span, study methods, and study depth. Therefore, after the study I, which preliminarily supported the MAIC training and get the researcher well informed and prepared, a RCT study with Chinese elite adolescent athletes from Hong Kong was conducted in the study II, to further evaluate the efficacy of the MAIC training, and gain in-depth understanding of athletes' experience (i.e., receptiveness and perceived impact) to facilitate the further development of the MAIC training.

Chapter 4: Study II

Methodology

Participants

In the study II, 40 athletes aged from 14-19 ($M_{\text{age}} = 15.75$, $SD_{\text{age}} = 1.31$; females = 17, males = 23), who never received any kinds of mindfulness-based training, were recruited from elite sport teams Wushu and Tenpin Bowling of the HKSI. In this study, 20 athletes ($M_{\text{age}} = 15.65$, $SD_{\text{age}} = 1.39$; females = 9, males=11) randomly assigned into MT group and 20 athletes ($M_{\text{age}} = 15.85$, $SD_{\text{age}} = 1.23$; females =8, males=12) randomly assigned into CG group thoroughly completed the study and data collection in it, and no one dropped out of the whole study process. Prior to the recruitment, the whole research plan was introduced to relevant head coaches, and informed consent was got from interested coaches, athletes, and parents or legal guardians before participation. Participation of all athletes was voluntary, and they could withdraw from the study at any time, and the confidentiality and anonymity of their data would be assured and respected.

Design

To address proposed research questions, the mixed-method (i.e., quantitative approach & qualitative approach) was used in the study II.

(1) Quantitative approach (*according to research question 1*):

The quantitative approach was used to testify the efficacy of the MAIC on athletes' sport training performance and relevant psychological factors (i.e., mindfulness, acceptance, and performance-related satisfaction). One 2x3 mixed design (between-subjects factor: experiment condition, including 2 levels; within-subjects factor: test point / time, including 3 levels). Forty elite adolescent athletes recruited from the HKSI were randomly assigned into two groups: (1) the mindfulness training group (MT, including 20 athletes) with the MAIC training, and (2) the control group (CG, including 20 athletes) with no intervention. Data

collection were conducted for both groups at pre-, post- and two months later following-the MAIC training, then, collected data were analyzed. Through the estimation of G*Power 3.1, to reach convention medium effect size 0.3 (2-sided $\alpha=0.05$, $\beta=0.05$) (Cohen, 1992), the sample size has to be at least 34. Therefore, the sample size of 40 fulfilled that.

(2) Qualitative approach (*according to research question 2*):

The qualitative approach was used to explore how the athletes experienced the MAIC training in terms of the athletes' receptiveness to the MAIC training, and the athletes' perceptions of the impact of the MAIC training. After the MAIC training, all athletes of MT group were invited to receive a semi-structure one-to-one interview, then the contents of interviews were conducted qualitative analysis.

Procedure

First of all, the whole research plan was introduced to relevant head coaches, after getting informed consent from interested head coaches and athletes, 40 elite adolescent athletes were recruited and assigned at random into one of two groups (MT & CG). Twenty athletes of MT received and completed the MAIC training within 2 months. During the 2 months, the other 20 athletes of CG did not receive any psychological interventions, but for fair consideration, the MAIC training would be also provided to athletes of CG after the whole research completed. Additionally, the usual situation of sport training practice was that the adolescent athletes were divided into different groups and took training at different times in each week according to the training program designed by their coaches. Therefore, after randomly assigning the MT and CG, it was possible to ask relevant coaches to organize athletes within MT to take training at a time, while athletes within CG to take training at another time. That could be helpful for avoiding contamination between MT & CG. Before, immediately after, and two months (an effective period demonstrated by, eg., Si et al., 2016) later following the MAIC training, three-point data collection were conducted for both MT

and CG, by measuring athletes' performance (i.e., coach-rating & athlete self-rating performance) and psychological factors (i.e., mindfulness level, acceptance level, and performance-related satisfaction).

Immediately after the MAIC training, all the athletes participating in the MAIC training were invited to take a semi-structure interview about their experience of the MAIC training, respectively. Finally, 14 athletes of the MT volunteered to participate in. Under the interview guideline, all interviews were implemented by the researcher, in a quiet and confidential setting (e.g., the researcher's office). Each of the interviews was about 30-45 minutes. All these interviews were completed within no more than two months after the end of the MAIC training.

Intervention

The MAIC program in the study II included seven sessions, and it was completed within 2 months. In the first seven weeks, the sessions of MAIC training were conducted once a week, each session lasted about 60 minutes. A general discussion was conducted in the last week. The MAIC training in both the study I and II was conducted by the researcher, who originally co-developed the MAIC training as a core author of the training manual. Additionally, this researcher had attended a series of local / international training workshops / courses and academic conferences related to the Mindfulness and Acceptance-based approach. Moreover, the researcher also made some relevant presentations in academic conferences / symposiums (e.g., Su, 2016) and had publications in peer reviewed journals (Liu, Liu, Guo, Su, & Huang, 2016). Moreover, the researcher had conducted some mindfulness and acceptance-based training programs for students and athletes (Wuhan Sports University, Education University of Hong Kong) as principal instructor or co-instructor in both Mainland China and HK.

Table 3.1. Details of Sessions in the MAIC Training Program

Time	Theme of Session	Content
Week 1	Introduction and Psycho-education	Introduction of the entire structure of MAIC; Introduction of the theoretical rationale and specific goals; Introduction of acceptance-based adversity coping; Story example; Practice of Brief Centering Exercise; Q & A about practice, explanation; Homework
Week 2	Introducing and Practicing Mindfulness	Introduction of Mindfulness (“as it is” & “here and now”); Story example; Practice of mindfulness (e.g., mindfulness breathing, mindfulness walking, mindfulness yoga, mindfulness eating, etc.); Q & A about practice, explanation; Homework
Week 3	Introducing and Practicing Decentering	Introduction of decentering; Ruminated self-orientation to decentered task-orientation; Story example; Mindfulness exercises such as forgetting-self behavior exercise; Q & A about exercise, explanation; Homework
Week 4	Introducing and Practicing Acceptance	Introduction of acceptance; Using acceptance-based adversity coping to facilitate understanding acceptance and avoidance of experiences; Acceptance and nonjudgement of adversity or distractions; Story example; Coexistence exercises; Q & A about exercise, explanation; Homework
Week 5	Introducing Value and Insight	Introduction of value and insight; Understanding the relationship among value, insight, mindfulness, and acceptance; Story example; Instruction of insight to find out value; Q & A about exercise, explanation; Homework
Week 6	Introducing Commitment	Introduction of commitment; Commitment for facing adversity and distractions; Linking commitment to value, insight, mindfulness, and acceptance; Story example; Q & A about exercise, explanation; Homework
Week 7	Comprehensive Review and Consolidation	Summary and overall understanding of the MAIC; Practice of Key exercises and link them up;

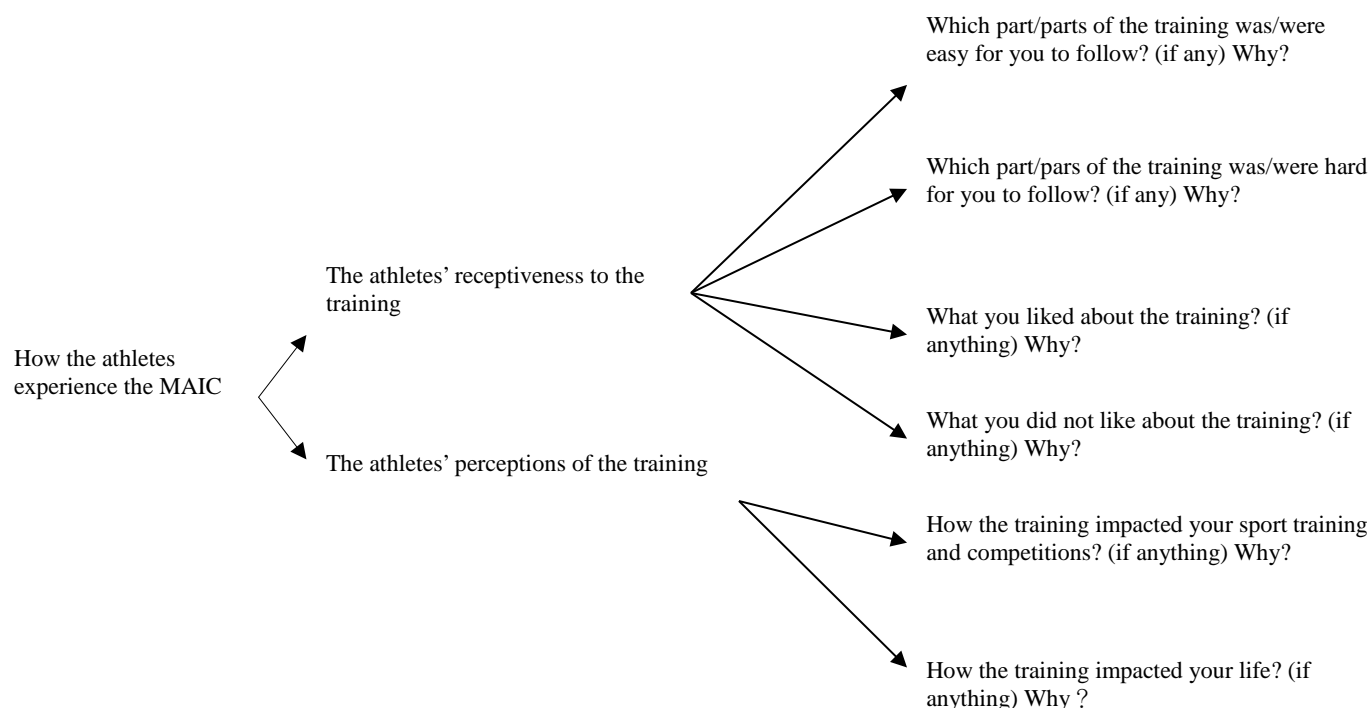
Week 8	General Discussion	Explanation of the requirement for continuous commitment General and open discussion about the entire MAIC
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Measures

All the measures used in the study II were the same ones applied in the study I.

Interview Guideline

Each semi-structure interview was conducted under the guide of six main interview questions as shown in the following interview map.



Data Analysis

The SPSS software was used to analyze the data collected for quantitative part (i.e., mindfulness, acceptance, performance-related satisfaction, & athletes' training performance). According to the 2x3 mixed design, 2x3 mixed-design ANOVA was performed for data analysis.

Audio recording was taken for all interviews. Then, all interview records were

transcribed verbatim. A combinative approach of inductive and deductive thematic analysis, which is often used for qualitative coding and analysis in reality (Braun & Clarke, 2006), was employed for analyzing data collected (i.e., the interview transcripts) for the qualitative part. Inductive thematic analysis is an appropriate approach to unveil the experience of the athletes about the MAIC training. Using inductive thematic analysis made it capable to generate cohesive and descriptive themes which can closely represent detailed experiences of the athletes (i.e., the receptiveness and perception) (Braun & Clarke, 2006). Combined with the subsequent process of deductive thematic analysis allowed the potentially conceptual proposition of the receptiveness and perceptions of the athletes toward the MAIC training to be integrated (Fereday & Muir-Cochrane, 2006). The combination of both inductive and deductive analysis was an iterative process. During this process, all possible meaning codes emerged from each transcript and themes developed through comparisons of meaning codes were closely discussed with a supervisor of the researcher, who is a renowned Chinese expert in the field of sport applied psychology and mindfulness and acceptance-based training, and two coaches of the athletes participating in the MAIC training, and repeated when necessary. Finally, through the thematic analysis, three hierarchies themes were identified and defined, the first hierarchy was the lower order themes, the second hierarchy was the higher order themes, and the third hierarchy was the general dimensions.

Results of Study II

Quantitative Part:

The SPSS 23.0 statistical software package was used to conduct the data analyses for study II. To screen the data collected, preliminary analysis were conducted and found that there were no missing data and no significant difference ($p > .05$) on all variables between both groups at pre-the MAIC training. A 2 (group) x 3 (data point) mixed-design ANOVA (i.e., two-way repeated measures analyses of variance) was conducted to examine the effect

of experimental conditions (i.e., between-subjects independent variable, including 2 levels: MT group and CG group) and data points (i.e., within-subjects independent variable, including 3 levels: pre-, post-, and follow up the MAIC training) on the athletes' mindfulness, acceptance, performance-related satisfaction, coach-rating training performance, and self-rating training performance. Then in further post hoc analyses, the one-way repeated measures ANOVA was conducted to investigate the within-subjects difference between three data points for both groups. Descriptive statistic results (i.e., mean, standard deviation, and Cronbach's α) of aimed variables of both groups at three data points were presented in Table 6.1.

Table 6.1

Descriptive statistics of the aimed variables at three data points.

Variables	Pre-			Post-			Follow-up		
	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α
Mindfulness									
MT	53.85	7.05	.94	62.80	6.78	.87	61.80	7.02	.92
CG	53.70	7.22	.80	53.70	6.91	.82	53.65	7.43	.86
Acceptance									
MT	22.55	7.53	.91	15.70	6.16	.93	19.50	6.13	.92
CG	22.50	7.41	.83	22.60	7.42	.87	22.55	7.04	.86
Satisfaction									
MT	25.95	3.78	.81	33.35	3.87	.82	30.50	3.72	.80
CG	25.90	3.74	.79	26.10	3.81	.77	26.00	3.83	.76
CR performance									
MT	21.20	2.93		25.40	1.90		23.10	2.71	
CG	21.35	3.01		21.20	2.84		21.40	2.91	
SR performance									
MT	19.80	3.00		24.15	2.72		22.20	2.65	
CG	19.85	3.10		20.05	2.98		20.00	3.04	

Note. *M* = Mean; *SD* = Standard Deviation; α = Cronbach's Alpha; CR performance = Coach-rating performance; SR performance = Self-rating performance.

Table 6.2

Summaries of post hoc independent-samples t-test.

Variables	Pre-			Post-				Follow-up			
	<i>t</i>	<i>p</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>df</i>	95% <i>CI</i>	<i>t</i>	<i>p</i>	<i>df</i>	95% <i>CI</i>
Mindfulness	.07	.947	38	4.20	<.001	38	[4.72, 13.48]	3.56	.001	38	[3.52, 12.78]
Acceptance	.02	.983	38	-3.20	.003	38	[-11.26,-2.54]	-1.46	.152	38	[-7.28, 1.18]
Satisfaction	.04	.967	38	5.97	<.001	38	[4.79, 9.71]	3.77	.001	38	[2.08, 6.92]
CR performance	-.16	.874	38	5.50	<.001	38	[2.65, 5.75]	1.91	.064	38	[-.10, 3.50]
SR performance	-.05	.959	38	4.54	<.001	38	[2.27, 5.93]	2.44	.020	38	[.37, 4.03]

Note. *t* = *t* value; *p* = *p* value; *df* = degree of freedom; *CI* = confidence interval; CR performance

= Coach-rating performance; SR performance = Self-rating performance.

Table 6.3

Summaries of post hoc pairwise comparisons.

Variables	Pre- vs. Post-		Pre- vs. Follow-up		Post- vs. Follow-up	
	<i>M diff</i>	<i>p</i>	<i>M diff</i>	<i>p</i>	<i>M diff</i>	<i>p</i>
MT						
Mindfulness	-8.95	<.001	-7.95	<.001	1.00	<.001
Acceptance	6.85	<.001	3.05	<.001	-3.80	<.001
Satisfaction	-7.40	<.001	-4.55	<.001	2.85	<.001
CR performance	-4.20	<.001	-1.90	<.001	2.30	.001
SR performance	-4.35	<.001	-2.40	<.001	1.95	<.001
CG						
Mindfulness	.00	1.00	.05	.84	.05	.88
Acceptance	-1.00	.541	-.05	.772	.05	.804
Satisfaction	-.20	.214	-.10	.33	.10	.494
CR performance	.15	.267	-.05	.748	-.20	.258
SR performance	-.20	.258	-.15	.379	.05	.789

Note. *M diff* = Mean difference; *p* = *p* value; CR performance = Coach-rating performance;

SR performance = Self-rating performance.

Mindfulness

The results of the 2 x 3 mixed-design ANOVA of mindfulness scores revealed that there

was a significant interaction (group x data point) effect between groups and data points with $F_{(2, 76)} = 275.79, p < .001$, Partial $\eta^2 = .88$. Furthermore, the main effect of groups was significant with $F_{(1, 38)} = 6.81, p = .013$, Partial $\eta^2 = .15$, suggesting that there was a significant between-group difference. And, the main effect of data points was significant with $F_{(2, 76)} = 273.14, p < .001$, Partial $\eta^2 = .88$, suggesting that there was a significant within-group difference. The results of post hoc independent-samples t-test presented in Table 6.2 revealed that the MT group's mindfulness scores were significantly higher than the CG group at both data points of post- and follow-up, suggesting that the mindfulness level of the MT group was significantly higher than the CG group at both data points of post- and follow-up. The results of post hoc one-way repeated measures ANOVA revealed that there was a significant difference in the MT group across three data points with $F_{(2, 38)} = 686.31, p < .001$, Partial $\eta^2 = .97$, and the pairwise comparisons presented in Table 6.3 revealed that the mindfulness scores at data points post- and follow-up were significantly higher compared with data point pre-, the mindfulness scores at data point post- were significantly higher than data point follow-up, suggesting that the mindfulness level of the MT group at both data points post- and follow-up was significantly better compared with data point pre-, and the mindfulness level at data point post- was also significantly better compared with data point follow-up. In addition, The results of post hoc one-way repeated measures ANOVA revealed that there was no significant difference in the CG group across three data points with $F_{(2, 38)} = 0.016, p = .98$, Partial $\eta^2 = .001$, and the pairwise comparisons (please see Table 6.3) also revealed that there was no significant differences of mindfulness scores between each other of three data points for the CG group, suggesting that the mindfulness level of the CG group had no significant differences across three data points.

Acceptance

The 2 x 3 mixed-design ANOVA for the scores of the CV-AAQ II (i.e., experiential

avoidance scores) revealed that there was a significant interaction (group x data point) effect between groups and data points with $F_{(2, 76)} = 38.58, p < .001$, Partial $\eta^2 = .50$. Furthermore, the main effect of data points was significant with $F_{(2, 76)} = 36.40, p < .001$, Partial $\eta^2 = .49$, suggesting that there was a significant within-group difference. However, the main effect of groups was not significant with $F_{(1, 38)} = 2.34, p = .134$, Partial $\eta^2 = .058$. The results of post hoc independent-samples t-test were presented in Table 6.2, and revealed that experiential avoidance scores of the MT group were significantly lower than the CG group only at the data point of post- without follow-up, suggesting that the acceptance level of the MT group was significantly higher than the CG group only at the data point of post-. The post hoc one-way repeated measures ANOVA for the MT group revealed that there was a significant difference across three data points with $F_{(2, 38)} = 39.45, p < .001$, Partial $\eta^2 = .68$, and the results of pairwise comparisons (please see Table 6.3) revealed that experiential avoidance scores at data points post- and follow-up were significantly lower compared with data point pre-, the experiential avoidance scores at data point post- were significantly lower than at data point follow-up, suggesting the acceptance level of the MT group at both data points of post- and follow-up was significantly higher than it was at data point pre-, and the level was significantly higher at data point post- compared with follow-up. Additionally, The results of post hoc one-way repeated measures ANOVA revealed that there was no significant difference in the CG group across three data points with $F_{(2, 38)} = 0.16, p = .853$, Partial $\eta^2 = .008$, and the pairwise comparisons (please see Table 6.3) also revealed that there was no significant differences of experiential avoidance scores between each other at three data points for the CG group, suggesting that the acceptance level of the CG group had no significant differences across three data points.

Satisfaction

By the 2 x 3 mixed-design ANOVA analysis of performance-related satisfaction scores,

the results revealed that there was a significant (group x data point) effect between groups and data points with $F_{(2, 76)} = 667.36, p < .001$, Partial $\eta^2 = .95$. Furthermore, the main effect of groups and data points were significant with $F_{(1, 38)} = 10.87, p = .002$, Partial $\eta^2 = .22$ and $F_{(2, 76)} = 742.18, p < .001$, Partial $\eta^2 = .95$, suggesting there were a significant between-group difference and a significant within-group difference, respectively. The results of post hoc independent-samples t-test (please see Table 6.2) revealed that the MT group's satisfaction scores were significantly higher than the CG group at both data points of post- and follow-up, suggesting the satisfaction level of the MT group was significantly higher than the CG group at both data points of post- and follow-up. The analysis by post hoc one-way repeated measures ANOVA for the MT group revealed that there was a significant difference across three data points with $F_{(2, 38)} = 1307.09, p < .001$, Partial $\eta^2 = .99$, and the results of pairwise comparisons (please see Table 6.3) revealed that satisfaction scores at data points post- and follow-up were significantly higher compared with data point pre-, the performance-related satisfaction scores at data point post- were significantly higher than at data point follow-up, suggesting the satisfaction level of the MT group at both data points of post- and follow-up was significantly compared with data point pre-, and the level at data point post- was also significantly higher compared with data point follow-up. In addition, the post hoc one-way repeated measures ANOVA for the CG group revealed that there was no significant difference in the CG group across three data points with $F_{(2, 38)} = 1.10, p = .344$, Partial $\eta^2 = .055$, and the pairwise comparisons (please see Table 6.3) also revealed that there was no significant differences of satisfaction scores between each other at three data points for the CG group, suggesting that the satisfaction level of the CG group had no significant differences across three data points.

Coach-rating performance

The results of the 2 x 3 mixed-design ANOVA for the scores of coach-rating sport

training performance revealed that there was a significant interaction (group x data point) effect between groups and data points with $F_{(2, 76)} = 26.13, p < .001$, Partial $\eta^2 = .41$. Furthermore, the main effect of groups was significant with $F_{(1, 38)} = 5.82, p = .021$, Partial $\eta^2 = .13$, suggesting that there was a significant between-group difference. And, the main effect of data points was significant with $F_{(2, 76)} = 22.49, p < .001$, Partial $\eta^2 = .37$, suggesting that there was a significant within-group difference. The results of post hoc independent-samples t-test (please see Table 6.2) revealed that the MT group's coach-rating performance scores were significantly higher than the CG group at both data points of post- and follow-up, suggesting the coach-rating performance of the MT group was significantly better than the CG group at both data points of post- and follow-up. The results of post hoc one-way repeated measures ANOVA revealed that there was a significant difference in the MT group across three data points with $F_{(2, 38)} = 25.91, p < .001$, Partial $\eta^2 = .58$, and the pairwise comparisons results (please see Table 6.3) revealed that the coach-rating performance scores at data points post- and follow-up were significantly higher compared with data point pre-, the scores at data point post- were significantly higher than data point follow-up, suggesting that the coach-rating performance of the MT group at both data points post- and follow-up was significantly better compared with data point pre-, and the coach-rating performance at data point post- was also significantly better compared with data point follow-up. Additionally, The results of post hoc one-way repeated measures ANOVA revealed that there was no significant difference in the CG group across three data points with $F_{(2, 38)} = .93, p = .405$, Partial $\eta^2 = .046$, and the pairwise comparisons results (please see Table 6.3) also revealed that there was no significant differences of coach-rating performance between each other of three data points for the CG group, suggesting that the coach-rating performance of the CG group had no significant differences across three data points.

Self-rating performance

The 2 x 3 mixed-design ANOVA analysis for the scores of self-rating sport training performance revealed that there was a significant interaction (group x data point) effect between groups and data points with $F_{(2, 76)} = 151.39, p < .001$, Partial $\eta^2 = .80$. Furthermore, the main effect of groups was significant with $F_{(1, 38)} = 5.20, p = .028$, Partial $\eta^2 = .12$, suggesting that there was a significant between-group difference. And, the main effect of data points was significant with $F_{(2, 76)} = 182.43, p < .001$, Partial $\eta^2 = .83$, suggesting that there was a significant within-group difference. The post hoc independent-samples t-test analysis results (please see Table 6.2) revealed that the MT group's self-rating performance scores were significantly higher than the CG group at both data points of post- and follow-up, suggesting the self-rating performance of the MT group was significantly better than the CG group at both data points of post- and follow-up. The post hoc one-way repeated measures ANOVA analysis for the MT group revealed that there was a significant difference across three data points with $F_{(2, 38)} = 357.24, p < .001$, Partial $\eta^2 = .95$, and the pairwise comparisons results (please see Table 6.3) revealed that the self-rating performance scores at data points post- and follow-up were significantly higher compared with data point pre-, the scores at data point post- were significantly higher than data point follow-up, suggesting that the self-rating performance of the MT group at both data points post- and follow-up was significantly better compared with data point pre-, and the self-rating performance at data point post- was also significantly better compared with data point follow-up. In addition, The post hoc one-way repeated measures ANOVA analysis for the CG group revealed that there was no significant difference across three data points with $F_{(2, 38)} = .71, p = .497$, Partial $\eta^2 = .04$, and the pairwise comparisons results (please see Table 6.3) also revealed that there was no significant differences of self-rating performance between each other of three data points for the CG group, suggesting that the self-rating performance of the CG group had no significant differences across three data points.

Qualitative Part:

All audio records of 14 athletes out of the MT group, who volunteered to participate in the interview, were transcribed verbatim to 266 A4 pages of transcripts in single space. Through the thematic analysis with all these transcripts, four general dimensions were emerged with regard to the athletes' experience (i.e., receptiveness and perceptions) of the MAIC training, including: (a) Attitude towards the MAIC training, (b) Reflection on the MAIC learning process, (c) Outcome of the MAIC training, and (d) Recommendation for future MAIC training. Within the four general dimensions, there were 11 higher order themes that were comprised of 43 lower order themes. Tables 6.4 to 6.7 demonstrated all the four general dimensions with higher order themes and lower order themes included in them, respectively. In the results, some of the athletes' quotes were also presented to facilitate elaborating the meaning of the themes.

General dimension a: Attitude towards the MAIC training

The general dimension a including four higher order themes (please see Table 6.4), in terms of (a) appealing to learner, (b) beneficial training, (c) novel approach and (d) willing to apply, represented the interviewed athletes' attitudes towards the MAIC training from the first touch to the end.

Table 6.4General dimension a: Attitude towards the MAIC training ($n = 14$)

Higher order themes	Lower order themes
Appealing to learner ($n = 14$)	Big interest at beginning ($n = 14$)
	Continuously high interest during the process ($n = 13$)
	Further interest after the end ($n = 11$)
Beneficial training ($n = 14$)	Help with sport ($n = 14$)
	Help with daily life ($n = 8$)
Novel approach ($n = 14$)	Different from other approaches learnt before ($n = 14$)
	Fresh conception ($n = 14$)
	Fresh skills ($n = 12$)
	Fresh mechanisms ($n = 11$)
Willing to apply ($n = 14$)	Use in sport ($n = 14$)
	Use in daily life ($n = 10$)
	Introduce to others to know and use ($n = 9$)

Note. The higher order themes were demonstrated in alphabetical order; n refers to the number of the athletes that mentioned the themes in the interview.

Appealing to learner. As participants taking part in the MAIC training, all of the fourteen athletes volunteered to participate in the interview commented that they felt very interested ever since their first exposure to the MAIC training at the first session. For instance, one athlete noted that, “I can also remember, at the first session, you spent concrete time introducing the content and potential function of the training, that introduction highly ignited my interest.” (A_1 , A_n refers to Athlete1 to Athlete14 according to the actual sequence of interview). Except one athlete who didn’t directly mentioned the interest he had during the process of training, all the others clearly expressed that they were continuously having intense interest in the training during the process. There was one athlete noted:

During that period, the things learnt from each session were usually emerged in my head

unconsciously, and every week I was longing for the session day could be coming soon.

That feeling was just like you were waiting for a present that you anticipated for a long time. I can't explain explicitly. However, I felt it gave me a room to reprieve. (A₃)

In addition, out of the fourteen athletes interviewed, eleven athletes mentioned their further interest to explore more of the mindfulness and acceptance-based training after the MAIC training ended. For example, one athlete described, "Although the training ended, if possible, I hope there could be a chance that the training or some related training can be provided likewise for me to explore more." (A₈)

Beneficial training. After participating in the MAIC training, all of the fourteen athletes interviewed reported feeling that this training was beneficial for them. Regarding the athletic life, all these fourteen athletes commented that the MAIC training could help them with their training and competition in sport. "I think it is very clear that my training and competing started to be kind of different when we were learning this approach, and it is helpful as you had described" said A₂. Similarly, another one stated, "You suggested that we should try the learnt in competition and found it helpful. I tried and gradually found yes, you are right." (A₇). Not only for the athletic life, there were also eight of fourteen athletes reported that they found the MAIC training could help with their daily life. For example, one athlete noted:

Obviously, I was sure it could be helpful for my sport training and competition.

However, since we had been learning it for some while, although I never actively thought of connecting it to my daily life, it seemed that my daily life kind of got assistance unconsciously, especially when I was facing problems. (A₃)

Novel approach. As the first time exposed to the mindfulness and acceptance-based training, all out of the fourteen athletes interviewed perceived the MAIC training as a novel approach for them. They all acknowledged that the MAIC training is very different from the other approaches that they had learnt before. "Although I had not a few experience of mental

training, this time really gave me a very fresh feeling, it made me feel distinct.” commented by A₉. Moreover, all the fourteen athletes expressed that a lot of fresh conceptions were provided in the MAIC training. One athlete stated, “There were so many conceptions that I had never heard before, such as experiential avoidance, experiential acceptance, and insight...” (A₁₃). Twelve athletes out of fourteen also clearly reported the skills provided by the MAIC training were fresh. For instance, one athlete noted, “I think, through doing the exercises given in sessions, I obtained some new skills that I had never known.” (A₁₂).

Another one described:

As you know, I have participated in some mental skills training before. However, I feel it is kind of different. Like breathing, I was taught to practice and use it mainly for getting myself relaxed in training or competition, but the mindful breathe seems advanced, it not only makes me relaxed, also leads me to focus on the present. (A₁₁)

In addition, through the description of most athletes interviewed, eleven out of fourteen, it could be revealed that there was a fresh mechanism underneath the MAIC training benefiting the athletes’ experience and performance that is different from the traditional PST approaches that are control-based. One athlete described his thinking as follows:

...as what I had learnt previously, about the optimal performance in competition, I always believed that if I want to get it, the prerequisite is that I have to get an optimal mental state. If a not so good mental state appeared, I would tell myself I shouldn’t have it, I have to control and diminish it. After the sessions, I started to doubt that if the optimal mental state was really so imperative? Why there were also not a few athletes achieved a good result when their feeling seemed not so good? Suddenly, I found that the most import was not what the mental state like, it should be how we react to it... (A₄)

Willing to apply. In the interview, all of fourteen athletes interviewed reported their

willingness to apply what they had learnt from the MAIC training in the reality. As a mindfulness and acceptance-based training specifically designed for athletes, all out of fourteen athletes interviewed expressed that they were willing to use the MAIC in their sport training and competition. “Sure, I definitely would like to use it. Especially when we were learning it, I had a strong impulse to try each new stunt I just learnt from it in training and competition.” stated A₅. Except in sport, out of the fourteen athletes interviewed, ten athletes also reported their willingness for using the MAIC in daily life. For example, one athlete noted:

I think, for me, there is no doubt that the things I have learnt from the sessions could be very helpful for me to use in my sport training and competition. If you asked about daily life, I have not actively think of that before. However, I think the answer still should be affirmative. If transfer it to the daily life, I think maybe it is also useful. So, if you ask, I think I should be willing to apply it in the daily life. (A₉)

In addition, there was a special willingness reported by ten athletes, that they would like to introduce the MAIC training to others to know and use. One athlete would like to introduce it to one of her teammates who was undergoing predicament, stating:

It’s helpful...that just reminds me of one thing. I hope it will not trouble you. I just would like to ask if it is ok for you to meet one of my teammates. She is kind of encountering some distresses, if you can have a contact with her and let her also learn it, I think it will definitely be helpful for her. (A₁₀)

General dimension b: Reflection on the MAIC learning process

The general dimension b represented the reflections of all the fourteen athletes interviewed on the learning process of the MAIC training, including two higher order themes, in terms of (a) challenge, and (b) favorite (please see Table 6.5).

Table 6.5General dimension b: Reflection on the MAIC learning process ($n = 14$)

Higher order themes	Lower order themes
Challenge ($n = 14$)	Hectic schedule ($n = 14$)
	Environment ($n = 12$)
	Conception understanding ($n = 12$)
	Uncomfortable practice ($n = 13$)
Favorite ($n = 14$)	Clear framework and rundown ($n = 14$)
	Sessions implemented prior to daily training ($n = 12$)
	Pre- and post-session practice ($n = 14$)
	Coaches' participation ($n = 13$)
	Q & A ($n = 12$)
	Breathing exercise ($n = 14$)

Note. The higher order themes were demonstrated in alphabetical order; n refers to the number of the athletes that mentioned the themes in the interview.

Challenge. All of the fourteen athletes interviewed reported that there were some challenges for them during the learning process of the MAIC training. Most of these elite adolescent athletes participating in the MAIC training were part-time athletes who also needed to go to school as full-time students as well. Even a few of them, who were full-time athletes, still needed to complete academic study in the schools cooperating with the HKSI. Therefore, all out of fourteen athletes reported that the hectic schedule of every day was a challenge for them engaging in the MAIC training. For instance, one athlete stated:

You know, every day is so long and busy. My home is far from both my school and the SI, and it is also a long distance from my school to SI. Every day, I have to get up early and go to school. After school, I need to hurry to get to SI as well. Sometimes, there is a tutor. I feel like a speeding top. I liked the sessions during that period. However, if every day is not so tight, I think I could be engaging more. (A₁₄)

Additionally, the space of residence being very narrow is universal reality for most of families in Hong Kong. That might make it hard for the athletes to find a convenient and comfortable place to practice after each session. And not a few athletes, twelve out of fourteen interviewed, also reported that environment could be a challenge for them during the learning process. "...not just because I was tired. I don't have my own room, and I can't find a private and tranquil space to do the homework practice..." noted A₆. Except the challenges encountered by the athletes related to time and self-practice space, part of the athletes interviewed also reported challenges they met when they were learning, related to the content of the MAIC. Twelve out of fourteen athletes interviewed reported that challenges were encountered about part of conceptions understanding. One athlete described, "It's not so easy for me to get the point of part of the conceptions, such as acceptance and insight, especially at the beginning, I was a little bit confused about what they were going to tell us." (A₇). Most of fourteen athletes interviewed, thirteen in total, also reported uncomfortable practice which meant they were not so comfortable when they were practicing part of the exercises provided by the MAIC training. For example, one athlete said, "You said we'd better not let ourselves fall asleep when we were practicing it, but I don't know if it's caused by fatigue, it was really easy for me to fall to sleep at the initial phase." (A₁₁). Other two athletes noted, "Some exercises seemed a little difficulty for me, like body scan, it almost liked a drudgery for me at my first touch of it." (A₈), and "At the beginning, the coexistence exercise was really painstaking for me, I nearly felt that I couldn't take it." (A₁₃).

Favorite. Besides the challenges described above, all out of fourteen athletes interviewed also reported their favorite factors during the learning process of the MAIC training. Among these favorite factors, the clear framework and rundown of the MAIC training was reported by all these fourteen athletes interviewed as a conducive aspect for their participation in the learning. For example, one athlete commented, "The construct of the

training was very explicit for me, especially at the first session, it already clearly let me know the entire structure of the training, and why should I learn it. I think that's helpful." (A₁).

Another one stated, "Each part of the whole training was clear, and the brief introduction of the constitution of the training and its goals and profits at the first session was motivating for me to engage in the following sessions." (A₄). Most of the athletes interviewed, twelve out of fourteen, explicitly reported that they liked the sessions implementation which was a specific design that each session was immediately followed by daily sport training. For example, one athlete stated:

I still remember that, during that period, each week, we took one session, and immediately after the session, we needed to complete our daily sport training of that day. I thought it should be a very good arrangement for us. Because, it was convenient for us that we didn't need to specifically find one more extra time to make it.

Moreover, we could apply what we just learnt in the session to our training shortly as well. (A₁₀)

Except the session implementation, all out of fourteen athletes reported that the practices both pre and post each session were meaningful and pertinent for them. One athlete said, "The practices before and after each session were helpful, that could help review what we had learnt at last session and consolidate what we just learnt at the current session." (A₉). Another one also noted:

I think these practices on sessions were imperative. I know you left home practice for us after each session, I don't know how the others did, but it was really not so easy to fulfill it very well. So the chance to practice on each session time became more important for me. (A₁₄)

In addition, nearly all of the athletes interviewed, thirteen out of fourteen, commented the coaches' participation in each session was one favorite part for them. For instance, one athlete

stated:

... Yes, both Ar K sir and M sir were participating in the sessions all the way with us together. They were not just observing, they practicing and discussing with us together. I think their participation was very meaningful for us. Their endeavor kind of motivated us to engage in the training more. (A₁₂)

Twelve out of fourteen athletes reported that the Q & A (i.e., question and answer about practice) in each session was also a section that made them feel beneficial. For example, one athlete commented, “In fact, sometimes, I did have some problems or get confused with certain practices, and the Q & A kind of helped me settle part of it.” (A₈). With respect to the exercises provided, all out of the fourteen athletes interviewed reported that the mindful breathing exercise was the most impressing and welcome for them. One athlete noted, “Among all these exercises, the mindful breathing got me most expressed, I felt it was the easiest one of them for me to master and apply.” (A₅), and another one stated, “... sure, I liked the breathing exercise, and it’s the one which I used most frequently in my training and competition.” (A₁).

General dimension c: Outcome of the MAIC training

The third general dimension, outcome of the MAIC training, represented what gains and impacts were mainly received by all of the fourteen athletes interviewed through completing the MAIC training. This general dimension included three main higher order themes, in terms of (a) Acquired competence, (b) Impact on sport training and competition and (C) Influence on daily life (please see Table 6.6).

Table 6.6General dimension c: Outcome of the MAIC training ($n = 14$)

Higher order themes	Lower order themes
Acquired competence ($n = 14$)	Attentional focus ($n = 14$)
	Let go of internal experience ($n = 9$)
	Flexible thinking ($n = 8$)
	Mindful breathing ($n = 14$)
Impact on sport training and competition ($n = 14$)	Enhanced performance ($n = 14$)
	Increased concentration ($n = 14$)
	Increased feeling of poise ($n = 14$)
	Increased confidence ($n = 10$)
	Increased feeling of mastery ($n = 9$)
Influence on daily life ($n = 10$)	Ameliorate interpersonal relationship ($n = 10$)
	Optimize action efficacy ($n = 8$)
	Promote academic study ($n = 7$)

Note. The higher order themes were demonstrated in alphabetical order; n refers to the number of the athletes that mentioned the themes in the interview.

Acquired competence. Through learning the knowledge and exercises imparted by the MAIC training, the athletes possessed some specific competence to face problems and their lives in and out sport. And all out of fourteen athletes interviewed made report on the competences acquired by completing the MAIC training. Among these competences, attentional focus on tasks at hand and present actions was reported by all the fourteen athletes interviewed. For example, one athlete commented, "... Gradually, I found that I was able to better focus on the task at hand, to do what I needed to do at present." (A₃). Another one also stated:

You know, in our competition, there usually are some guys that mean to play some little tricks to annoy you. That could be their tactics. However, I definitely don't like it, and I

was very easy to be distracted by such cunning guys previously. After taking the sessions, whenever I encountered such situation again, I could remind myself that it doesn't matter, then call myself back and refocus on the current strike one hundred percent. (A₁₁)

Nine athletes, out of the fourteen athletes interviewed, reported the acquired competence to let go of the internal experiences (e.g., thoughts, emotions, and physiological sensations), especially be able to disentangle from negative internal experiences and coexist with them. For instance, one athlete stated:

Previously, once I had any negative feelings, I would kept trying hard to hold it down. However, harder I tried, more uncontrollable it went. It seemed like a vicious spiral obsessing me. Fortunately, I am now able to get myself out of the tangle with these feelings and allow them to exist as they are. (A₁)

Flexible thinking, as one of the acquired competences from the MAIC training, was reported by eight out of the fourteen athletes interviewed. One athlete described:

...the way of my thinking was a little bit different then. I admit that I was kind of be inspired by the content of session related to insight. It was conspicuous that I was not so stubborn as before, and I started trying to view things from different angles and dig some new valuable points... (A₁₀)

In addition, all out of the fourteen interviewed athletes reported that acquiring the mindful breathing made them have one potent competence/tool to cope with different problems they may encounter. For example, one athlete noted, "It was like a potent tool, no matter what troubles occur, I was going to think of it and give it a try." (A₇). Another athlete also stated:

After knew how to use it, I felt it became one anchor in my heart, once I started feeling I was becoming unstable, I would use it, then I kind of felt the power it offered not only to get me relaxed, but also to connect me to the present firmly. (A₅)

Impact on sport training and competition. Along with the acquired competence from the MAIC training, the impact on sport training and competition of the athletes emerged. Out of the fourteen athletes interviewed, all reported that their sport training and competition were impacted by completing the MAIC training to some extent. The most obvious was athletes' enhanced performance in training and competition, and all these fourteen athletes interviewed reported performance enhancement. For example, one athlete commented that, "I could be engaging more in my training, and the effectiveness of my training was also getting better than before." (A₂). Another one also stated:

I also played for a local team. I don't know if you know, there are a small league for fun for a group of local teams in Hong Kong, and we have league matches at each weekend. During that period, I was trying to utilizing the learnt from the sessions when playing the league matches. Initially, no so much different, but some while later, my condition seemed getting better and better like I was able to overcome some old barriers that were very tough for me before, and I won more matches for my team. (A₄)

Through completing the MAIC training, the athletes' concentration on their training and competition could be increased. All out of the fourteen athletes interviewed reported that one direct impact of the MACI training for them was the increased concentration. "Undoubtedly, I could more stick to the substance of training, rather than outside distractions or my inner feeling, emotions, and thoughts.", said A₁₂. Another athlete also noted, "It became easier for me to recover from mistakes and negative feelings or emotions, and I was able to engage my limited energy and power in what was really important for me in competition." (A₉).

Furthermore, all these fourteen athletes interviewed also reported that their increased feeling of poise was one of the impacts of the MAIC training. Through completing the MAIC training, the athletes became more composed and relaxed in training and competition. Their emotion stability was improved while unnecessary worries were decreased. "I could

definitely feel more relaxed in training”, expressed by A₃. Another athlete stated:

Before, once the situation is going good for me in match, I then could not help to overthink and get anxious. Like I just finished several strikes in a row, suddenly, I was going to worry about if I could keep making one more strike at next hit. And when I was thinking about that, I would become very irritable. Now, if the same situation, I’m sure I can be more composed and just paly the present hit as my best. (A₁)

In addition to the above impacts, part of the fourteen athletes interviewed also reported that the MAIC training had impacts on their confidence and feeling of mastery in training and competition. Through completing the MAIC training, ten out of fourteen athletes interviewed expressed that they were more confident that they were able to cope with adversities and performance as well as they should in training and competition, especially in competition.

For example, one athlete stated:

In the past, I always believed in that good performance in the competition had to be equal to winning it. If I did not win, it definitely meant my performance sucked.

However, my belief were totally changed after the sessions. I absorbed that the real good performance should be that I can cope with different adversities well in competition, rather than a simple result of win. The final result can be win or lost, my opponents can be tough or weak, no matter how they are, I can just focus on the adversities encountered regardless of any distractions and believe in achieving it. (A₁₀)

Nine out of the fourteen athletes interviewed reported that a feeling of mastery were yield about their training and competition. They commented that they felt less worried about losing control and play their sport more calmly and orderly. “I can better distinguish the controllable from the uncontrollable, and I know just focus on the controllable, that makes me feel I can keep the things in my own pace, no need to hurry and worry”, said A₆.

Influence on daily life. Except the impacts on sport training and competition of the

athletes, part of the athletes interviewed, ten out of fourteen, reported that the MAIC training also certainly influenced their daily life in terms of interpersonal relationship, action in normal life, and academic study. Through completing the MAIC training, the athletes became more patient and benign, ten out of the fourteen athletes interviewed reported that helped them with their interpersonal relationship with others, especially the import ones (e.g., parents and friends). “During interaction with my friends, I can feel that I’m getting kinder and more delightful not only to them but also to myself”, stated A₁. Another athlete also noted:

...Less fight with my mother. Before, I was such a person that was very irritable and impatient in real life. It was very easy for me to have a quarrel with my mom. After taking the training, I find that I kind of become more patient and nicer step by step. Now, I would like to listen to mom, and can better understand what she really wants to express. (A₈)

The athletes’ behaviors in real life also became more active, positive and moderate, that highly improved the efficacy of their actions. Eight out of the fourteen athletes interviewed reported that their action efficacy were optimized through completing the MAIC training. One athlete mentioned, “...I became more self-disciplined, and my procrastination behavior less...” (A₁₀). Another athlete also stated, “I do no longer be afraid that there too many things fully fill of the life, I try now to positively arrange a feasible schedule for it and improve the efficacy of my behavior.” (A₆). In addition, seven out of the fourteen athletes interviewed reported their academic study was improved as well, since they became more focused on their school and better coping with their academic stressors. For instance, one athletes stated, “I am not so worried about the pressures from school like before, and can better face and deal with them.” (A₄). And another one noted, “I became more relaxed and focused on my study that made me more efficient in it.” (A₆).

General dimension d: Recommendation for future MAIC training

The general dimension d, including two higher order themes (please see Table 6.7), represented the advices provided by the athletes interviewed for improving future MAIC training, in terms of the delivery of the MAIC training and necessary instruction after the end of the MAIC training in the future.

Table 6.7

General dimension d: Recommendation for future MAIC training ($n = 14$)

Higher order themes	Lower order themes
Delivery of the MAIC ($n = 14$)	Smaller group ($n = 11$)
	Individual meeting ($n = 9$)
	Sport-specific cases ($n = 12$)
	More monitoring and feedback ($n = 10$)
	Longer program duration ($n = 7$)
Instruction after the end ($n = 12$)	Practice guide ($n = 11$)
	Application guide ($n = 12$)
	Evaluation guide ($n = 9$)
	Continuous communication with instructor ($n = 12$)

Note. The higher order themes were demonstrated in alphabetical order; n refers to the number of the athletes that mentioned the themes in the interview.

Delivery of the MAIC. In order to improving the effectiveness of the MAIC training in future, all out of the fourteen athletes interviewed offered their own suggestions on the format/way of the training delivery. Not a few athletes interviewed, eleven out of fourteen, reflected that they liked the training being delivered in group that included less people. One athlete stated, “I’d like the session could be conducted in smaller group.” (A₁₃). Similarly, another athlete also commented:

If you ask my opinion, be honest, I think the group was a little bit huge. Such big group

is not my style. I don't so like so many people in one group to learn something. In the future, if it is possible, I hope the number of the group can be smaller. So, there should be less distractions, and I believe the effectiveness will also be improved. (A₁₄)

Except conducting sessions in smaller group, nine out of the fourteen athletes interviewed also reflected that the individual meeting with the instructor after session should be helpful and imperative. For example, one athlete stated:

...Sure, I remember that you lead us to make some personal share and discussion with each other in the sessions, coaches also included. However, you know, it is, after all, not such a convenient place to speak all self out in front of other athletes. If it's available for you, one to one meeting with you outside the sessions should definitely be helpful and necessary for us. (A₇)

Most of the athlete interviewed, twelve out of fourteen, reflected that they would like more sport-specific cases or stories to be added in the sessions, since it should be helpful for them to understand relevant conceptions and how to apply the learnt to real sport life. "Sharing cases of other athletes was interesting and helpful for me, I like more cases added", said A₂. And another one also stated, "I think if there could be more real cases or stories for our information, I could be better inspired and instructed to connect what was taught in the sessions to my real situation." (A₅). In addition to adding more sport-specific cases, not a few athletes interviewed, ten out of fourteen, reflected that they would like more added monitoring and feedback on the progress of their learning and homework that would be beneficial for improving their learning effectiveness. One athlete noted, "Sometimes, we were slack, if there could be more monitoring, it should be good." (A₈). Another athlete stated, "In fact, it was not so easy for us to fulfill the homework assigned well just on our own, if close monitoring and feedback could be provided on it, I think it might be promoted" (A₆). Furthermore, part of the athletes interviewed, seven of fourteen, reflected that they

would like the total duration of the training could be longer. For example, one athlete stated:

I think it could be longer...no, I mean the number of the sessions could be more, and the total duration could be longer than eight weeks. Actually, I felt I just warmed up to it when half of the sessions passed, soon it had already been finished, and it's not long enough for me to hold the learnt firmly. So, after the sessions, up to now, I have lost certain things that I had learnt in it. (A₁₃)

Instruction after the end. Except suggestions on the training delivery in the future, part of the athletes interviewed, twelve out of fourteen, also proposed that necessary instructions related to practice, application, evaluation and communication after the end of the MAIC training should be offered by the instructor in future. Although the training sessions were done, the athletes thought they still needed necessary guide for how to sustain the mindful practices on their own, apply what had learnt to the real scenarios, and evaluate their progress time to time. Eleven out of fourteen athletes interviewed reflected that, in order to keep doing practices well, they would like some guides could be provided for their practice by themselves after the sessions end. “After the end of the training, I think some necessary guides for practices by ourselves are needed to make sure us keeping practicing and maintaining the effectiveness”, noted A₁. Most of the athletes interviewed, twelve out of fourteen, reflected that, in order to utilize what they had learnt from the training after it ended, some necessary guides for application in real scenarios were needed. For instance, one athlete stated:

During the session period, we followed the instructions in the training to practice and try to apply the things we gained to our training and competition. However, after the end of the training, some necessary instructions are still needed, since I find that I will also encounter various problems and difficulties when applying it in the real situation. (A₁₄)

Nine out of fourteen athletes also reflected that they still needed guides for evaluating their

progress and achieved effectiveness of mindfulness. One athlete noted, “I hope there would be some guides for us to evaluate our progress and the effectiveness, it could be helpful for us keeping motivation and right-direction.” (A₁₀). In addition to guides for practice, application and evaluation, not a few athletes interviewed, twelve out of fourteen reflected that they would like to keep continuous communication with the instructor to discuss about relevant issues and problem emerged after the end of the training. For example, one athlete noted, “If it’s possible, I hope have a continuous communication with you for discussing and enquiring when necessary.” (A₁₁). Another one also stated, “I think the communication with you is very helpful and necessary for me to maintain and apply what I have learned, I’m sure I can get some inspiration from each time we talk.” (A₁₀).

Discussion for Study II

The effectiveness of the MAIC training program

Based on the study I of this research, the purpose of the study II was to use the mixed method (i.e., quantitative approach & qualitative approach) to further testify the efficacy of the MIAC training and gain in-depth understanding of athletes’ experience participating in the training (i.e., athletes’ receptiveness to the training, and athletes’ perceptions of the impact of the training) among Chinese elite adolescent athletes from Hong Kong. In the quantitative part with the RCT, the athletes of the MT group who completed the MAIC training significantly improved their mindfulness, acceptance, performance-related satisfaction and sport training performance compared to the control group. Additionally, for the MT group, the athletes’ mindfulness, acceptance, performance-related satisfaction and sport training performance were also significantly improved at both data points post- and follow-up training compared to the data point pre-training. In the qualitative part, following semi-structured interviews with fourteen athletes of the MT group who volunteered to be interviewed, the thematic analysis revealed four general dimensions about the athletes’ experience of

completing the MAIC training, including the athletes' attitudes towards the MAIC training, their reflections on the MAIC learning process, the outcomes received from the MAIC training, and their recommendations for the future MAIC training. These findings of both quantitative part and qualitative part which could be supported by each other, consistently demonstrated the efficacy of the MAIC training and the substantive receptiveness and perceptions reported by the athletes participating in it. All these findings added evidences for studies on the effectiveness of the MAIC training on Chinese athletes' sport performance and relevant internal experience (e.g., thoughts and emotions), also provided support to previous studies (e.g., Birrer et al., 2012; Gardner & Moore, 2012; Lindsay & Creswell, 2017) on the mindfulness and acceptance-based training in the realm of sport psychology. Furthermore, substantial information and inspiration emerged from the findings that deserved to be considered to facilitate the development and application of the MAIC training.

Persistence of regular mindfulness practice and different types of mindfulness practice

One of the main aims of the MAIC training specifically designed for Chinese athletes is to cultivate athletes' mindfulness (Si et al., 2014; Su et al., 2019). As expected, the finds of study II revealed that the level of athletes' mindfulness was improved though participating in the MAIC training, that is also in line with previous studies on the MAIC training (e.g., Bu, 2015; Bu & Si, 2014; Liu et al., 2016; Si et al., 2016; Zhang, Si et al., 2016). However, some problems about athletes' mindfulness cultivation were also found in this study, which are worth to further discussing. In the current study, although the mindfulness level of the athletes of the MT group was significantly improved compared to the control group, it significantly dropped at the data point follow-up compared to the data point post-training. Similar phenomenon was reported in a previous study (i.e., Zhang et al., 2016) on the MAIC training, and the main reason was explained as poor adherence to home-based mindfulness practice following the end of the training (Rosenzweig, Greeson, Reibel, Green, Jasser, &

Beasley, 2010). The current study also supports this point, and advocates that persistence of regular mindfulness practice is important to be emphasized. Except poor adherence, the drop may also relate to mindfulness practice types and characteristics of adolescent athletes from Hong Kong. To date, there are three most researched types of mindfulness practice that mainly aim to focused attention (FA), open monitoring (OM) and loving-kindness (LK), respectively (Lippelt, Hommel, & Colzato, 2014). FA requires the practitioner to constantly focus attention on a chosen object or event, such as breathing, to avoid mind wandering (Tops, Boksem, Quirin, IJzerman, & Koole, 2014). Compared to FA, OM has higher requirements for the practitioner that need to stay in monitoring state, remain attentive to any experience that might appear, without selecting and judging (Lippelt et al., 2014). Usually, FA is easier for the novice practitioner to start. A considerable amount of time is needed for the practitioner to become enough familiar with FA, then they can progress to OM. Although both FA and OM were involved in the current MAIC training, FA was more highlighted than OM. For characteristics of adolescent athletes from Hong Kong, their ability of perseverance and logical thinking may not be mature enough. Therefore, it can be found in this study that the athletes participating in the MAIC training preferred the content and practice (e.g., mindful breathing exercise) associated with FA that was easier them to grasp, but felt difficult and uncomfortable with the content and practice (e.g., as it is and body scan exercise) associated with OM that demanded more. In addition to the athletes' poor adherence to regular practice potentially caused by both personal characteristics and realistic conditions (e.g., narrow residence space in Hong Kong, and adolescent athletes' hectic schedule) after the end of training, the entire duration of eight weeks for the MAIC training program in this study may not be long enough for adolescent athletes to get ready to advance to OM. That also explained why part of the athletes recommended extending the entire duration of the training in the interview. All these above discussed points may finally resulted in the drop of

the athletes' mindfulness after the end of the MAIC training.

Cultivating acceptance: Long time Work

Acceptance, as another core component of the existing mindfulness training interventions (Chambers, Gullone, & Allen, 2009), is associated and interacts with mindfulness (Lindsay & Creswell, 2017). Improving mindfulness can facilitate experiential acceptance (Gardner & Moore, 2007; Zhang, et al., 2016). That was also supported by the finds of the current study. In this study, the acceptance level of the athletes participating in the MAIC training was significantly improved at the data point post-training compared to the control group. However, there was no significant difference between the MT group and the control group at the data point following-up. In a previous study on the MAIC training within free combat athletes from Mainland China (Bu & Si, 2014), the improvement of acceptance was also not such significant as expected. That was explained as two main reasons, including (a) acceptance was introduced too late in the training, and there was no enough time for the participants to improve it sufficiently, and (b) acceptance was not so easy for the participants to understand. In fact, some mindfulness skills (e.g., FA) are easier to improve immediately after practice, while acceptance may take longer to cultivate (Lindsay & Creswell, 2017). Moreover, some mindfulness skills (e.g., OM) are the basic to cultivate acceptance. Therefore, mindfulness was often introduced in advance of acceptance in the existing mindfulness and acceptance-based training. In addition, acceptance as a broad construct, including some conceptions (e.g. nonjudgement, nonreactivity, openness) which are very distinct from the traditional PST, may be abstract and ambiguous and need more efforts and time for athletes to understand (Josefsson, Ivarsson, & Gustafsson et al., 2019). Given all the above mentioned points, it could become simple to understand why the athletes' acceptance level was not improved as well as expected after the end of the MAIC training in the current study. Like what happened to mindfulness, even the acceptance can't be introduced early as

mindfulness, enough long time may also be needed and imperative for the athletes to understand and practice it, especially for the adolescent athletes whose personal characteristics (e.g., perseverance and logical thinking) may not be mature enough.

Potential explanation on the improvement of the performance

Mindful mind raised along with mindfulness and acceptance improving may provide great preconditions for ideal sport performance (Josefsson et al., 2019). Not a few studies have found sport performance based on coach or self-rating was improved by participating in mindfulness and acceptance-based training (e.g., Gardner, & Moore, 2007; Lutkenhouse, 2007). Some previous studies on the MAIC training also supported sport performance could be improved by attending the training (Bu, 2015; Bu & Si, 2014; Liu et al., 2016; Si et al., 2016; Zhang et al., 2016). In line with these previous studies, athletes' training performance in this current study was significantly improved after receiving the MAIC training.

Furthermore, as the training performance improving, the athletes' performance-related satisfaction also had positive change. Although the underlying psychological mechanisms of mindfulness with mindfulness-related outcomes still need to further explore (Lindsay & Creswell, 2017; Lutz, Jha, Dunne, & Saron, 2015), certain elements of mindfulness (e.g., FA and acceptance) may result in behavioral improvements (Chambers et al., 2009). Focused attention on present task may be able to get it easier for athletes to be less impacted by various distractions that may restrain their performance (Gardner & Moore, 2012). Mindful acceptance, that facilitates changing athletes' relationship to internal experiences (e.g., thoughts, emotions, and feelings), may offer an economical way to utilize their mental resources for sport tasks in training or competition (Gardner & Moore, 2012; Moore, 2009). In addition, as reported by the athletes in the interviews, the improved abilities of flexible thinking and letting go of internal experiences that may facilitate improving the athletes' concentration, confidence, and poise. These improvements or changes may help athletes to

get ready and make right decisions for high-level performance when facing challenging situations in training or competition (Josefsson et al., 2019). Moreover, all sessions involving conceptual education and operational practices were implemented prior to the athletes' daily sport training in this current study that may also be one important facilitator for athletes to get good performance and feel satisfied in training. However, as the levels of mindfulness and acceptance dropped after the end of the MAIC training, both the athletes' training performance and performance-related satisfaction had some setbacks at data point following up. For athletes, especially adolescent athletes, in order to well assimilate and apply what have learnt from the mindfulness and acceptance-based training, a longer period of practice and evaluation may be needed to maintain or strengthen the effect of the mindfulness and acceptance-based training on their performance (Bühlmayer, Birrer, Röthlin, Faude, & Donath, 2017; Josefsson et al., 2019).

Effectiveness of the MAIC training program outside of sport

Not only do the mindfulness and acceptance-based interventions can provide benefits in sport, but they are also helpful and valuable for participants to apply outside of sport (Cote, Baltzell, & Diehl, 2019). There have been a few existing qualitative studies on the mindfulness and acceptance-based interventions supported that these interventions could benefit the participants' academic study, personal growth, interpersonal relationships, work-life balance, overall well-being, mental health and life satisfaction out side of sport contexts (Cote et al., 2019; Longshore & Sachs, 2015). Additionally, one RCT study on the MAIC training evidenced that the training was effective on motor skills learning of beginners (Zhang et al., 2016). The findings of the qualitative part in the current study also supported that the MAIC training could be beneficial for athletes not just in sport. As the levels of mindfulness and acceptance improved and some specific skills (e.g. flexible thinking, let go of internal experiences) were acquired, improved academic study, action efficacy, and

interpersonal relationships in the athletes' daily life were reported in the interviews of the current study. Given all these findings about the effectiveness of the mindfulness and acceptance-based interventions on the daily life outside of sport, the MAIC training that was specifically designed for Chinese athletes applying in sport training and competition may be transferrable from sport to athletes' daily life. Especially for the adolescent athletes who always have hectic schedules for both sport and academic study, they can use what they have learnt from the MAIC training to balance their sport and daily life, and achieve effective and efficient actions in and outside of sport.



Chapter 5: General Summary and Conclusion

In order to examine whether the MAIC training specifically designed for Chinese athletes is appropriate for Hong Kong elite adolescent athletes, this research used two studies, including one single-case designed study and one mixed-method (i.e., RCT and qualitative approach) study, to testify the effectiveness of the MAIC training on mindfulness, acceptance, sport training performance as well as performance-related satisfaction of the elite adolescent athletes from the HKSI, and explore the athletes' experience (i.e., receptiveness and perceptions) of attending the MAIC training. The findings of both studies together provided contributions to the MAIC training, in terms of its delivery, application, empirical research, and further development. Based on the findings and integrated with relevant existing literatures, this chapter generally discussed and summarized these contributions in detail from three aspects: (a) implications on the application and delivery of the MAIC training, (b) current research limitations and future research directions, (c) further possible development of the MAIC training.

Implications on the application and delivery of the MAIC training

As a mindfulness and acceptance-based training specifically designed for Chinese athletes, the MAIC has been applied with Chinese athletes from different sports (e.g., Chinese free combat, Shooting, Tennis, and Wushu) in a number of studies (e.g., Bu, 2015; Bu & Si, 2014; Liu et al., 2016; Zhang et al., 2016). The findings of these applied studies demonstrated the efficacy of the MAIC on relevant psychological factors (e.g., mindfulness, acceptance, cognitive flexibility, and mode state) and athletic performance (e.g., training or competition performance, flow experience, and skill acquisition) (Su et al., 2019). The findings of this current research were also in line with these existing studies. Mainly based on the findings of the current research as well as integrated with these existing studies, potential implications on how to effectively apply and deliver the MAIC training among Chinese

athletes were summarized as follows.

With regard to the application of the MAIC, even the current research and existing applied studies have generally supported its applied effectiveness, there are still several implications that needed to pay serious consideration and attention. Firstly, through the current research and other studies (e.g., Bu & Si, 2014) on the MAIC training, the findings implied that acceptance may be more difficult for the athletes to acquire and apply, compared with mindfulness. In contrast to mindfulness, acceptance may be more abstruse (Josefsson et al., 2019), and may take longer to cultivate while the skills of mindfulness, especially like the FA, seem easier to improve immediately after practice (Baer, Carmody, & Hunsinger, 2012; Desbordes et al., 2015). Hence, the practitioners often train their mindfulness at first, then progress to train their acceptance when they are familiar enough with the skills of mindfulness (Lindsay & Creswell, 2017). There should be association and interaction between mindfulness and acceptance, and they should be able to facilitate each other reciprocally. However, mindfulness seems more fundamental for practitioners first exposed to the mindfulness and acceptance-based training, especially for the adolescent athletes whose patience and understanding ability are not mature enough. To sum up, it could be a useful rule for novices to grasp and apply the MAIC that they would better gradually learn and apply mindfulness and acceptance in sequence with patience. Secondly, mindfulness should be systematically fostered in specific surrounding environments, and different styles of mindfulness practices and skills elicit different and specific psychological and physiological outcomes (Davis & Hayes, 2011). Clear and consistent connection between the mindfulness and acceptance-based training and specific surrounding environments where the athletes inhabit is essential for the athletes to achieve effective assimilation and application (Baltzell et al., 2014; Cote et al., 2019). The existing studies on the MAIC training were mainly applied in the athletes from individual sports, and the FA and OM of mindfulness skills were

mainly cultivated and applied. However, when applying the mindfulness and acceptance-based training to team sports, it should be imperative to create warmth and caring for self and team (Baltzell et al., 2014). In addition to FA and OM, the LK of mindfulness, which focuses on developing love and compassion for both self and others (Lippelt et al., 2014), then could be a potent consideration to cultivate athletes' caring and compassion. Furthermore, the MAIC as an indigenous mindfulness and acceptance-based training, socio-cultural contexts also need to be considered when applying it to Chinese athletes (e.g., how to use the MAIC to balance the personal and social-oriented values) (Bu, 2015; Bu & Si, 2014). Given the findings of the current research, if sport psychology practitioners would like to apply the MAIC in a social context like Hong Kong that has relevant social realities, such as narrow residence environment, hectic schedule on sport and school, and high expectation and requirement from family or the public, that could be big challenges for the adolescent elite athletes to bear and should be considered and integrated with the application to make sure achieving expected effectiveness. In summary, pertinent connection with specific sport environments and social environments should be helpful and imperative for athletes to achieve good assimilation and application of the mindfulness and acceptance-based training. Finally, not a few studies have found that the mindfulness and acceptance-based interventions not only positively impacted participants in sport, but also benefited them outside of the sport context (e.g., Baltzell et al., 2014; Cote et al., 2019; Sachs & Longhore, 2015). Especially for student athletes, in order to achieve satisfaction in sport, their satisfaction outside of the sport context may also be the inevitable factor that needs to be considered. Potential transferability of the impact of the mindfulness and acceptance-based interventions in sport to other domains (e.g., academics and mental health) of student athletes' lives has been demonstrated by relevant studies (Baltzell et al., 2014; Cote et al., 2019). In this current research, for the adolescent elite athletes from Hong Kong, most of whom were part-time athletes and full-

time students, academic study and interpersonal relationships with import others (e.g., parents, teachers, and friends) may be equally important as sport to them and may become challenges that could interfere their sport performance. Although the MAIC was mainly designed to train athletes in sport, the findings of the current research demonstrated that the impacts of the MAIC could be transferred to the athletes' daily life related to their academic study, interpersonal relationships and action efficiency. Hence, when applying the MAIC to student athletes, especially to the adolescent athletes, transferring its relevant impacts to accommodate the athletes' daily life may facilitate its overall effectiveness on the athletes in sport.

With regard to the delivery of the MAIC training, there are some potential implications revealed by the current research and other relevant studies. Firstly, in Study II of the current research, two coaches, who were in charge of the athletes' daily sport training, participated alongside the athletes in all the sessions of the whole MAIC training. During this process, except helping organize the sessions and relevant tests, both coaches were also learning and practicing with the athletes together and discussing and sharing their experience with the athletes in the sessions. Their active participation not only encouraged the athletes to engage more in the sessions, but also benefited them to instruct their athletes to effectively apply what had learnt from the sessions to daily sport training. Most of the athletes also expressed their coaches' participation was one of their favorite parts of the training. Hence, involving participation of the coach when delivering the mindfulness and acceptance-based training may be valuable and helpful for the athletes to gain more (Baltzell et al., 2014). Secondly, although the current research and relevant previous studies have supported the effectiveness of the MAIC training, it usually was found that the effectiveness dropped after the end of the training. Poor perseverance of regular practice may be one reason caused this situation. However, the entire duration of the MAIC training program was not long enough for the

athletes, especially for the adolescent athletes, to practice and assimilate all these novel knowledges and skills offered by the training may also be another reason. For example, in study II of the current research, part of the athletes suggested that if the entire duration of the training program could be longer, they would have learnt the MAIC better. Hence, in the future mindfulness and acceptance-based training for athletes, especially for the adolescent athletes, if the program and practice can be sustained longer enough, the better effectiveness may be achieved by the athletes (Bühlmayer et al., 2017; Josefsson et al., 2019; Doron, Rouault, Jubeau, & Bernier, 2020). Thirdly, key messages and skills provided by the mindfulness and acceptance-based interventions should be connected to a sport context for enhancing athletes' assimilation and application to their sports (Doron et al., 2020). In this current research, all the sessions of the MAIC training were implemented prior to the athletes' daily sport training. That was also reported by the athletes as one of their favorite parts which gave them chance to apply what they had just learnt in the sessions to their sports as immediately as possible. If possible, arranging the sessions prior to the athletes' daily sport training should be a beneficial choice when delivering the mindfulness and acceptance-based interventions. Finally, findings of relevant previous studies (e.g., Cote et al. 2019) revealed that athletes, especially the student athletes, thought team setting for delivering the mindfulness and acceptance-based training was not helpful, and they prefer one-on-one setting. In the current research, the athletes also proposed that the delivery could be better if the group could get smaller. They also expressed that they would like individual meeting with the instructor to share and discuss their experiences. Although it is hard to deliver the mindfulness and acceptance-based training in a one-on-one setting for a big group of athletes due to realistic reasons (e.g., limited time of the instructor and difficulties of setting an appropriate schedule for every athlete), the main reason why the athletes would like one-on-one setting is they would like a convenient and easy environment to share personal problems

and experiences with the instructor (Cote et al. 2019). However, even the one-on-one setting is hard to offer, relevant social communication platforms (e.g., WhatsApp, Wechat, and FaceBook) could be a potential choice to provide room that may get the athletes relaxed to share and discuss with the instructor, and also help the instructor to monitor the athletes' progress and provide pertinent feedbacks in time.

Current research limitations and future research directions

There are several limitations in the current research that should be recognized and addressed in the future research on the mindfulness and acceptance-based training. Firstly, there is always a difficulty of the researches on applying the mindfulness and acceptance-based interventions in an elite athlete sample and assessing its effects in comparison to a control group (Birrer & Morgan, 2010), since it usually is hard to select a large enough sample from elite athletes that are a unique and scarce population (Doron et al., 2020). Moreover, selecting elite athletes as part of a control group is also very difficult and ethically questionable (Doron et al., 2020). In the current research, in order to testify the effects of the MAIC training, four athletes were recruited in the study I with a single-case design and 40 athletes were recruited for the RCT part in the study II. Although the sample size of 40 in the study II could fulfill the basically accepted standard of the statistical tests needed, it was still not large enough to guarantee a robust statistic power. In addition, since the athletes were invited to receive the interviews voluntarily in the qualitative part of the study II, the interviews just covered 14 out of 20 athletes, rather than all 20 athletes participating in the MAIC training. Hence, the results should be read with caution. Secondly, the use of self-reported measures was reported as a potential limitation in many existing literatures of the studies on the mindfulness and acceptance based training (e.g., Doron et al., 2020; Josefsson et al., 2019; Zhang et al., 2016). However, in the current research, the self-reported measures were used to measure relevant psychological factors (i.e., mindfulness, acceptance, and

performance-related satisfaction) and athletes' training performance (i.e., athletes' self-rating training performance) as well. Although the sport-specific measures regarding mindfulness, acceptance, and performance-related satisfaction used in the current research were developed or revised specifically for Chinese athletes, and coach-rating training performance was also measured when it was impossible to develop a general objective performance measure that could be adequately appropriate for multiple sports (Josefsson et al., 2019), these self-reported measures may not be sufficiently accurate (Grossman & Van Dam, 2011) or easily cause common method biases (Podsakoff, MacKenzie, & Podsakoff, 2012) and relevant self-evaluation bias (e.g., Noetel, Ciarrochi, Sahdra, & Lonsdale, 2019). Finally, in the current research, except the coach-rating training performance, all the other measures were self-reported by the adolescent athletes. Given the characteristics of the adolescent athletes whose cognitions and behaviors may not mature enough and tending to build standing and expression as expected, there could be potential for them to not respond truthfully when completing these self-reported measures.

Based on the above mentioned limitations and current situation of the existing studies on the MAIC training, there could be several potential directions for the future researches. Firstly, even there have been not a few studies applying the MAIC training among Chinese athletes, most of these studies were case or single-case designed studies (e.g., Bu & Si, 2014; Bu, 2015; Liu et al., 2016; Si et al., 2016). Although the single-case designed method have been well developed and proved to be an important way of evaluating effects of interventions (especially for elite athletes) in the field of applied sport psychology (Su et al., 2019), the RCT studies are still imperative to sufficiently prove powerful evidences for the effectiveness of the interventions (Gardner & Moore, 2012). However, the RCT studies on the MAIC training are very scarce, the only one published RCT study so far was conducted with sports university students yet (Zhang et al., 2016), rather than elite athletes. In the future, more RCT

studies with large samples of elite athletes should be needed to further examine the effects of the MAIC training. Additionally, in order to gain in-depth understanding of the athletes' real experience (e.g., receptiveness and perceptions) of completing the mindfulness and acceptance-based interventions, the qualitative exploration studies are needed, but still are a few currently (Baltzell et al., 2014; Cote et al., 2019). Hence, qualitative exploration studies on the MAIC training should be also needed, and it would be better if more longitudinal studies could use mixed method design involving both the RCT and the qualitative exploration to thoroughly identify the effects of the MAIC training and the athletes' real experience in the future (Josefsson et al., 2019). Moreover, if possible, the interviews of the qualitative exploration should be better to cover all the athletes participating in the training (Baltzell et al., 2014; Cote et al., 2019), and inviting the coaches of the athletes to participate alongside as the interviewees could be considered as well in the future. Secondly, even not easy to make it, but to use more objective measures in the researches on the mindfulness and acceptance-based training has been appealed by a lot of studies (e.g., Zhang et al., 2016; Josefsson et al., 2019). In the future, hope more and more objective measures or indicators, such as the heart rate variability (HRV) and saliva secretory immunoglobulin A (SIgA) (Zhang et al., 2016), could be used in the researches on the MAIC training. Thirdly, some researchers have proposed that different kinds of sports (e.g., team sports VS. individual sports, and open-skill sports VS. closed-skill sports) require different performance proficiencies which may relate to athletes' real experience and adherence to different mindfulness practices that may have different functions (Cote et al., 2019; Lippelt et al., 2014). Therefore, different and specific effects of the mindfulness and acceptance-based interventions on athletes from different sporting environments should be explored, and that will yield inspiration on how to provide specific tailored interventions to different sports (Colzato & Kibele, 2017). To date, existing studies on the MAIC training were mainly

conducted with individual sports. In the future, the effects of the MAIC training on different kinds of sports still need to further explore. Additionally, athletes of different levels and different ages may have different characteristics and different main goals that may result in different experience and effects of the MAIC training (Su et al., 2019; Zhang et al., 2017). Hence, the effects of the MAIC training on athletes from different levels and ages need to be further explored as well. Fourthly, the transferability of the mindfulness and acceptance-based training from sport contexts to athletes' daily life and mental health has been proved by many studies (e.g., Baltzell et al., 2014; Cote et al., 2019). Moreover, the mental health of athletes has gained more and more attention all over the world (Reardon et al., 2019), and accommodating athletes' daily life should be very import for athletes' sport-specific performance, especially for adolescent student athletes. In the future, the effect of the MAIC's transferability on athletes' mental health and daily life may be worth further exploring. Finally, although the effects of the mindfulness and acceptance-based training has been supported by a lot of literatures (Birrer et al., 2012), there are still few theories link the psychological mechanisms of mindfulness to the mindfulness-related outcomes, and it catches heavy interests from researchers seeking to characterize the underlying mechanisms of the mindfulness and acceptance-based interventions (Lindsay & Creswell, 2017). The existing studies on the MAIC training have preliminarily supported its effects on relevant psychological factors and sport-related performance. However, the underlying process involved in the MAIC training is still vague, and the relationship between relevant psychological factors (e.g., mindfulness and acceptance) and sport-related performance still needs to explore. In the future, more researches on the underlying mechanisms and functioning process of the MAIC training for athletes in sports should be conducted.

Further possible development of the MAIC training

Based on the findings of the existing studies and the current research on the MAIC

training with Chinese elite athletes, several aspects could be considered for the further development of the MAIC training as follows:

Firstly, preparing and educating athletes to clearly know and understand what they are going to participate in before they really start their substantial learning activities in the mindfulness and acceptance-based training programs is very important for athletes to buy in the programs (Baltzell et al., 2014). In order to let athletes to have a brief and explicit understanding and expression of the MAIC training, a more explicit and coherent introduction of the entire structure of the MAIC training and arrangement guideline of the program procedure could be provided at the beginning in the further developed MAIC training (Su et al., 2019). The connections and relationships of the core contents (e.g., core conceptions and mindfulness skills) involved the MAIC training could be introduced. For instance, the connection and relationship between mindfulness and acceptance, and how to use particular mindfulness practices / techniques to cultivate them, as well as how to specifically apply them to different types of sports could be considered to introduce in the further developed MAIC. Furthermore, at the beginning of each session, the connection and relationship with last session could be explicitly introduced and explained. In addition, further developed arrangement guideline of the program procedure could be provided at the beginning. For example, athletes at different ages may need different entire duration to well assimilate the mindfulness and acceptance-based training, and young athletes (e.g., adolescent student athletes) may need more time to buy in the training program (Baltzell et al., 2014; Doron et al., 2020). Hence, the guideline of more flexible duration and sessions (e.g., 2-4 months and 7-12 sessions) of the training program could be provided according to athletes' requirements and realities, rather than limiting it within 2 months with 7-8 sessions.

Secondly, the mindfulness and acceptance-based interventions should be specific to the surrounding environments (e.g., social and sport environments) where athletes are involved

(Cote et al., 2019), and the sociocultural elements should be explored and placed to sport psychology trainings (Si, Duan, Li, & Jiang, 2011). For the further development of the MAIC training, the Chinese sociocultural elements could be further integrated with the training (Su et al., 2019). For example, the “Insight (覺悟)” from Chinese Zen Buddhism could be further explored and applied for developing the MAIC training (Zhang, Bu, & Si, 2012). Although insight has been integrated in the current MAIC training, more explicit operational concept, functional mechanisms, evaluation methods, and specific stories or cases could be explored and added in the future MAIC training. Additionally, the acceptance-based adversity coping model, which is consistent with the concept “suffering” of Eastern Buddhism (Zhang et al., 2012), categorized Chinese athletes into three stages, in terms of climb stage, plateau stage, and enlightened stage (Zhang, Si, Chung, & Bu, 2017). Athletes in different stages have distinct characteristics and main goals that would influence athletes to identify distinct stage-related values (Su et al., 2019). Integrating with the acceptance-based adversity coping model to help athletes identify specifically stage-related values and commit in values-driven behaviors could be added in the future MAIC training. Besides, relevant social realities for Chinese athletes, such as pressures and challenges from the society, should be considered and connected with the MAIC training in the future.

Thirdly, cultivating athletes’ mindfulness and acceptance with the mindfulness and acceptance-based interventions may need long-term, gradual, and regular practice (Baltzell et al., 2014; Doron et al., 2020), and perseverance of regular practice after the end of the intervention is imperative (Zhang et al., 2016). Hence, an explicit and elaborate instruction for athletes’ continuous practice after the MAIC ending could be provided in the future. This instruction could involve contents as follows: (a) how to persist the sustainable practice, (b) how to specifically apply the learnt to athletes’ own sports, (c) continuous feedback and evaluation (e.g., a continuous feedback platform has been provided by the MAIC developing

team with a Wechat Official Account called “Athletics Psychology (竞技心理)”, and (d) frequently asked questions encountered by athletes and relevant answers.

Fourthly, to further develop the MAIC training, new auxiliaries and applied materials could be added in the future (Su et al., 2019). Athletes’ individual and home-made practices are very important (Cote et al., 2019; Zhang et al., 2016), relevant audio guides of practices could be produced and provided to facilitate athletes’ individual practices by their own after the formal sessions. Moreover, the mindfulness and acceptance-based interventions for athletes should be linked to specific sporting environments (Colzato & Kibele, 2017). Hence, more real and sport-specific cases or stories of athletes could be added to illustrate how to well grasp the MAIC and apply it to sport-specific scenarios. Besides, relevant sport-specific measurements developed or revised specifically for Chinese athletes, such as the Athlete Mindfulness Questionnaire (AMQ; Zhang et al., 2017) and Chinese version of the Acceptance and Action Questionnaire II (CV-AAQ II; Zhang et al., 2014), could be added in the further developed MAIC training.

In fact, based a series applied studies on the MAIC training with Chinese elite athletes as well as the current research, five years after the manualized MAIC training first published in 2014, the second edition of the MAIC training manual including most of the above mentioned developments is coming out soon in 2020 (Si, Su, Zhang, Jiang, Li, & Huang, 2020). And, a brief accordance between the MAIC program design and aims of the second edition please see Figure 8.1.

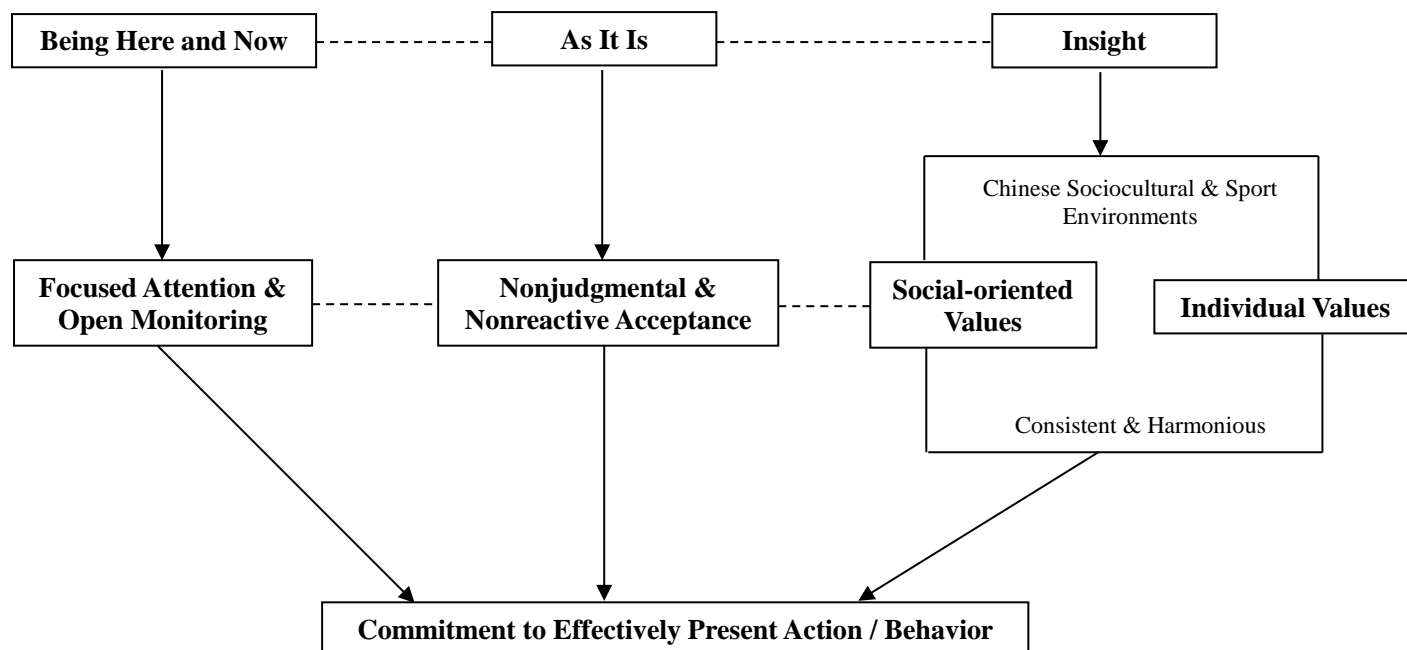


Figure 8.1. Accordance between the MAIC program design and aims in the 2nd edition

General Conclusion

Since the inception of the MAIC training program specifically designed for Chinese athletes in 2014, it has been six years passed. During the last six years, a series of applied studies on Chinese elite athletes from different sports and areas of China have examined and supported the effectiveness of the MAIC training (e.g., Bu & Si, 2014; Bu, 2015; Liu et al., 2016; Si et al., 2016; Zhang et al., 2016; Bu, Liu, Zhang, Si, & Chung, 2018). In line with these existing studies, the current research also supported the MAIC training should be effective on improving relevant psychological factors (i.e., mindfulness, acceptance, and performance-related satisfaction) and sport performance (i.e., sport training performance) for adolescent elite athletes from Hong Kong. Moreover, through qualitative exploration on the experiences of the athletes completing the MAIC training, the current research gained in-depth understanding of the athletes' real receptiveness and perceptions to the MAIC training. The results of the qualitative exploration were consistent with and support the findings of quantitative part in this research, as well as revealed the deficiencies of the current MAIC

training program and provided concrete suggestions for the further development of the training. Although preliminary supports for the effectiveness of the MAIC training for Chinese elite athletes have been obtained, there are still some limitations of the training and researches on it that need to be addressed in the future. Just like cultivating athletes' mindfulness can't accomplish in an action, the MAIC training as a mindfulness and acceptance-based training specifically designed for Chinese athletes also needs continuous development (Si et al., 2020). Base on the extant and future coming researches on the MAIC training, the researcher, as a core member of the MAIC developing team, will keep engaging in developing the MAIC training to be an indigenous and well theoretical- and practical-designed mindfulness and acceptance based training approach for Chinese athletes all the way with the other developing team colleagues.

Reference

- Aherne, C., Moran, A. P., & Lonsdale, C. (2011). The effect of mindfulness training on athletes' flow: An initial investigation. *The Sport Psychologist*, 25, 177-189.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: a conceptual and empirical review. *Clinical Psychology Science and Practice*, 10(2), 125-143.
- Baer, R. A., Carmody, J., & Hunsinger, M. (2012). Weekly change in mindfulness and perceived stress in a mindfulness-based stress reduction program. *Journal of Clinical Psychology*, 68(7), 755-765.
- Baltzell, A., & Akhtar, V. L. (2014). Mindfulness meditation training for sport (MMTS) intervention: Impact of MMTS with division I female athletes. *Journal of Happiness & Well-Being*, 2014, 2(2), 160-173.
- Baltzell, A., Caraballo, N., Chipman, K., & Hayden, L. (2014). A qualitative study of the mindfulness meditation training for sport: Division I female soccer players' experience. *Journal of Clinical Sport Psychology*, 8(3), 221-244.
- Baltzell, A., Chipman, K., Hayden, L., & Bowman, C. (2015). Qualitative study of MMTS: Coaches' experience. *Journal of Multidisciplinary Research*, 7(3), 5-20.
- Bandura, A. (1997). Self-efficacy: Towards a unifying theory of behavioral change. *Psychological review*, 84, 192-215.
- Behncke, L. (2004). Mental skills training for sports: A brief review. *Athletic Insight*, 6, 1-24.
- Bernier, M., Thienot, E., Codron, R., & Fournier, J. F. (2009). Mindfulness an acceptance approaches in sport performance. *Journal of Clinical Sports Psychology*, 4, 320-333.
- Birrer, D., & Morgan, G. (2010). Psychological skills training as a way to enhance an athlete's performance in high-intensity sports. *Journal of Medicine and Science in Sports*, 20, 78-87.
- Birrer, D., Röthlin, P., & Morgan, G. (2012). Mindfulness to enhance athletic performance:

- Theoretical considerations and possible impact mechanisms. *Mindfulness*, 3(3), 235-246.
- Bohart A. (1983). *Detachment: a variable common to many psychotherapies?* Paper Presented at the 63rd Annual Convention of the Western Psychological Association San Francisco, CA.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Breslin, C. F., Zack, M., & McMain, S. (2002). An information-processing analysis of mindfulness: Implications for relapse prevention in the treatment of substance abuse. *Clinical Psychology: Science and Practice*, 9, 275-299.
- 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, 822–848.
- Bu, D.R. (2015). The effectiveness of Mindfulness-Acceptance-Insight-Commitment (MAIC) on tennis athletes: A case study. *Hubei Sports Science*, 34(1), 55-57.
- Bu, D., Liu, J. D., Zhang, C.-Q., Si, G., & Chung P.-K. (2019). Mindfulness training improves relaxation and attention in elite shooting athletes: A single-case study. *International Journal of Sport Psychology*, 50, 4-25.
- Bu, D. R., & Si, G. Y. (2014). Effect of Psychological Intervention Based on Mindfulness-Acceptance on the Sanda Athletes' Performance: A Single-Case Design Study. *Journal of Tianjin University of Sport*, 29(6), 27-30.
- Bühlmayer, L., Birrer, D., Röthlin, P., Faude, O., & Donath, L. (2017). Effects of mindfulness practice on performance-relevant parameters and performance outcomes in sports: A meta-analytical review. *Sports Medicine*. 47(11), 2309-2321.
- Burton, D. (1989). Winning isn't everything: Examining the impact of performance goals on collegiate swimmers' cognitions and performance. *The sport psychologist*, 3, 105-132.

- Carmody, J. (2009). Invited Commentary: Evolving Conceptions of Mindfulness in Clinical Settings. *Journal of Cognitive Psychotherapy*, 23, 270-280.
- Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review*, 29(6), 560-572.
- Cheung, E., & Chiu, P. (2016). Students at breaking point: Hong Kong announces emergency measures after 22 suicides since the start of the academic year. *Online South China Morning Post: Health & Environment*. Retrieved from: <http://www.scmp.com/news/hong-kong/health-environment/article/1923465/students-breaking-point-hong-kong-announces>.
- Cohen, A., Pargman, D., & Tenenbaum, G. (2003). Critical elaboration and empirical investigation of the cusp catastrophe model: A lesson for practitioners. *Journal of Applied Sport Psychology*, 15, 144-159.
- Colzato, L. S. & Kibele, A. (2017). How Different Types of Meditation Can Enhance Athletic Performance Depending on the Specific Sport Skills. *Journal of Cognitive Enhancement*, 1, 122-126.
- Cote, T., Baltzell, A., & Diehl, R. (2019). MMTS 2.0: A Qualitative Exploration of Division I Tennis Players' Completing the Mindfulness Meditation Training for Sport 2.0 Program. *Sport Psychologist*, 33(3), 1-34.
- Cottraux, J. (2007). *Thérapie cognitive et emotions: La troisième vague [Cognitive therapy and emotions: The third wave]*. Paris: Elsevier Masson.
- Creswell, J.D. (2017). Mindfulness interventions. *Annual review of Psychology*, 68, 491-516.
- Daw, J., & Burton, D. (1994). Evaluation of a comprehensive psychological skills training program for collegiate tennis players. *The Sport Psychologist*, 8, 37-57.
- Davis, D. M., & Hayes, J. A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy (Chic)*, 48(2), 198-208.

- Deikman, A. J. (1982). *The observing self: Mysticism and psychotherapy*. Boston: Beacon Press.
- Desbordes, G., Gard, T., Hoge, E. A., Hölzel, B. K., Kerr, C., Lazar, S.W., Olendzki, A., & Vago, D. R. (2015). Moving beyond mindfulness: Defining equanimity as an outcome measure in meditation and contemplative research. *Mindfulness*, 6(2), 356 – 372.
- Doron, J., Rouault, Q., Jubeau, M., & Bernier, M. (2020). Integrated mindfulness-based intervention: Effects on mindfulness skills, cognitive interference and performance satisfaction of young elite badminton players. *Psychology of Sport and Exercise*, 47, 101638.
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5, 1-11.
- Gardner, R.C. (2001) 'Integrative motivation and second language acquisition', in Z. Dornyei and R. Schmidt (eds), *Motivation and second language acquisition*, Honolulu, HI: University of Hawai'i Press.
- Gardner, F. L., & Moore, Z. E. (2004). A mindfulness-acceptance-commitment-based approach to athletic performance enhancement: Theoretical considerations. *Behavior Therapy*, 35, 707–723.
- Gardner, F. L., & Moore, Z. E. (2007). *The psychology of enhancing human performance: The mindfulness-acceptance-commitment approach*. New York: Springer.
- Gardner, F. L., & Moore, Z. E. (2012). Mindfulness and acceptance models in sport psychology: A decade of basic and applied scientific advancements. *Canadian Psychology*, 4, 309-318.
- Gould, D., Damarjian, N., & Greenleaf, C. (2002). Imagery training for peak performance. In J. L. Van Raalte & B. W. Brewer (Eds.), *Exploring sport and exercise psychology* (2nd

- ed., pp. 49-74). Washington, DC: APA.
- Grabovac, A. D., Lau, M. A., and Willett, B. R. (2011). Mechanisms of mindfulness: A Buddhist psychological model. *Mindfulness*, 2(3), 154–166.
- Grossman, P., & Van Dam, N. (2011). Mindfulness, by any other name....: trials and tribulations of sati in western psychology and science. *Contemporary Buddhism*, 12(1), 219-239.
- Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers*. New York: John Wiley & Sons.
- Harvey, D.T., Van Raalte, J., & Brewer, B.W. (2002). Relationship between self-talk and golf performance. *International Sports Journal*, 6, 84-91.
- Hasker, S. M. (2010). *Evaluation of the mindfulness-acceptance-commitment (MAC) approach for enhancing athletic performance* (Doctoral Dissertation). Indiana University of Pennsylvania, Indiana, Pennsylvania.
- Hayes, S. C. (2004). Acceptance and Commitment Therapy, Relational Frame Theory, and the third wave of behavior therapy. *Behavior Therapy*, 35, 639-665.
- Hayes, S.C., Strosahl, K., & Wilson, K.G. (1999). *Acceptance and Commitment Therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Huang, Z. J., & Su, N. (2017). Mindfulness Applied in Sport: Systematic Review of Main Mindfulness-Based Approaches. *Chinese Journal of Sports Medicine*, 36(8), 740-747.
- Jackson, S. A., & Csikszentmihalyi, M. (1999). *Flow in sports*. Champaign, IL: Human Kinetics.
- Jackson, S. A., Thomas, P. R., Marsh, H. W., & Smethurst, C. J. (2001). Relationships between flow, self-concept, psychological skills, and performance. *Journal of Applied Sport Psychology*, 13, 129-153.
- Josefsson, T., Ivarsson, A., Gustafsson, H., et al. (2019). Effects of Mindfulness-Acceptance-

- Commitment (MAC) on sport-specific dispositional mindfulness, emotion regulation, and self-rated athletic performance in a multiple-sport population: An RCT study. *Mindfulness*, 10, 1518-1529.
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York: Delacourte.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion.
- Kabat-Zinn, J. (2013). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York: Bantam Dell.
- Kabat-Zinn, J., Beall, B., & Rippe, J. (1985). *A systematic mental training program based on mindfulness meditation to optimize performance in collegiate and Olympic rowers*. Poster presented at the World Congress in Sport Psychology, Copenhagen, Denmark.
- Kaufman, K., Glass, C., & Arnkoff, D. (2009). Evaluation of mindful sport performance enhancement (MSPE): A new approach to promote flow in athletes. *Journal of Clinical Sports Psychology*, 4, 334-356.
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., & Carmody, J. (2006). The Toronto Mindfulness Scale: Development and Validation. *Journal of Clinical Psychology*, 62(2), 1445-1467.
- Lindsay, E. K., & Creswell, J. D. (2017). Mechanisms of mindfulness training: Monitor and Acceptance Theory (MAT). *Clinical Psychology Review*, 51, 48-59.
- Linehan, M. M. (1993). *Skills training manual for treating borderline personality disorder*. New York: Guilford Press.
- Lippelt, D. P., Hommel, B., & Colzato, L. S. (2014). Focused attention, open monitoring and loving kindness meditation: effects on attention, conflict monitoring, and creativity - A review. *Frontiers in psychology*, 5, 1083.

- Liu, T., Liu, X. L., Guo, Y. N., Su, N., & Huang, Z. J. (2016). Effect of mindfulness intervention on Wushu training and competition. *Journal of Chengdu Sport University*, 42(5), 88-92.
- Longshore K., & Sachs, M. (2015). Mindfulness training for coaches: A mixed-method exploratory study. *Journal of Clinical Sport Psychology*, 9(2), 116-137.
- Lutkenhouse, J. M. (2007). The case of Jenny: A freshman collegiate athlete experiencing performance dysfunction. *Journal of Clinical Sport Psychology*, 1, 166-180.
- Lutz, A., Jha, A. P., Dunne, J. D., & Saron, C. D. (2015). Investigating the phenomenological matrix of mindfulness-related practices from a neurocognitive perspective. *American Psychologist*, 70(7), 632-658.
- Lutz, A., Slagter, H. A., Dunne, J. D., & Davidson, R. J. (2008). Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences*, 12(4), 163-169.
- Maynard, I. W., Smith, M. j., & Warwick-Evans, L. (1995). The effects of cognitive intervention strategy on competitive state anxiety and performance in semi-professional soccer players. *Journal of Sport and Exercise Psychology*, 17, 428-446.
- Meichenbaum, D. (1977). *Cognitive behaviour modification: An integrative approach*. New York: Plenum Press.
- Moore, Z.E. (2007). Critical thinking and the evidence-based practice of sport psychology. *Journal of Clinical Sports Psychology*, 1, 9-22.
- Moore, Z. E. (2009). Theoretical and empirical developments of the mindfulness-acceptance-commitment (MAC) approach to performance enhancement. *Journal of Clinical Sports Psychology*, 2009, 4, 291-30.
- Moore, Z. E., & Gardner, F. L. (2001, October). *Taking applied sport psychology from research to practice: Integrating empirically supported interventions into a self-regulatory model of athletic performance*. Workshop presented at the meeting of the

Annual Conference of the Association for the Advancement of Applied Sport Psychology, Orlando, FL.

- Murphy, S.M., & Woolfolk, R. (1987). The effects of cognitive interventions on competitive anxiety and performance on a fine motor skill accuracy task. *International Journal of Sport Psychology*, 18, 152-166.
- Noetel, M., Ciarrochi, J., Sahdra, B., & Lonsdale, C. (2019). Using genetic algorithms to abbreviate the Mindfulness Inventory for Sport: A substantive-methodological synthesis. *Psychology of Sport and Exercise*, 45, 101545.
- Orlick, T., & Partington, J. (1988). Mental links to excellence. *The Sport Psychologist*, 2, 105-130.
- Parker, R. I., & Vannest, K. J. (2009). An improved effect size for single-case research: Nonoverlap of All Pairs. *Behavior Therapy* 40, 357-367.
- Parker, R. I., Vannest, K. J., Davis, J. L. (2011). Effect size in single case research: A review of nine non-overlap techniques. *Behavior Modification*. 35, 302-322.
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2010). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63(1), 539-69.
- Purdon, C., & Clark, D. A. (1999). Metacognition and obsessions. *Clinical Psychology and Psychotherapy*, 6, 96-101.
- Reardon, C., Hainline, B., & Aron, C. M. et al. (2019). Mental health in elite athletes: International Olympic Committee consensus statement (2019). *British Journal of Sports Medicine*, 0, 1-33.
- Roemer, L. & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for Generalized Anxiety Disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive behavioral models. *Clinical Psychology: Science and Practice*,

9, 54-68.

- Rosenzweig, S., Greeson, J. M., Reibel, D. K., Green, J. S., Jasser, S. A., & Beasley, D. (2010). Mindfulness-based stress reduction for chronic pain conditions: Variation in treatment outcomes and role of home meditation practice. *Journal of psychosomatic research* 68(1), 29-36.
- Schwanhausser, L. (2009). Application of the Mindfulness-Acceptance-Commitment (MAC) Protocol with an Adolescent Springboard Diver: The Case of Steele. *Journal of Clinical Sports Psychology*, 3, 377-396.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: Guilford Press.
- Safran, J. D., & Segal, Z. V. (1990). *Interpersonal process in cognitive therapy*. New York: Basic Books.
- 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.
- Shapiro, S. L., Carlson, L. E., Astin, J.A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62, 373–386.
- Si, G. (2006). Pursuing “ideal” or emphasizing “coping”: The new definition of “peak performance” and transformation of mental training pattern. *Sport Science*, 26, 43–48.
- Si, G., Duan, Y., Li, H. Y., & Jiang, X. (2011). An exploration on sociocultural meridians of Chinese athletes’ psychological training. *Journal of Clinical Sport Psychology*, 5, 325-338.
- Si, G., Lee, H. C., and Lonsdale, C. (2010). Sport psychology research and its application in China. In M. H. Bond, (Ed.), *The Oxford handbook of Chinese psychology* (pp. 641–

- 656). Hong Kong, P. R. China: Oxford University Press.
- Si, G., Lo, C.-H., & Zhang, C.-Q. (2016). Mindfulness training program for Chinese athletes and its effectiveness. In A. Baltzell (Ed.), *The Cambridge Companion to Mindfulness and Performance* (pp. 235-267). New York, NY: Cambridge University Press.
- Si, G. Y., Zhang, G. Z., Su, N., & Zhang, C. Q. (2014). Theory origin and content design of mindfulness training program for Chinese athletes. *Chinese Journal of Sports Medicine*, (33)1, 56-61.
- Si, G. Y., Zhang, G. Z., Su, N., Zhang, C. Q., Jiang, X. B., & Li, H. Y. (2014). *Mindfulness training manual for athletes*. Beijing: Beijing Sport University Press.
- Si, G. Y., Su, N., Zhang, C. Q., Jiang, X. B., Li, H. Y., & Huang, Z. J. (2020). *Mindfulness training manual for athletes (2nd Edition)*. Beijing: Beijing Sport University Press.
- Su, N. (2016 June). *Theoretical and practical genesis of mindfulness-based training*. Oral presentation on Experience Sharing Symposium of mindfulness training. Guangdong Provincial Sports Training Center, Guangzhou, China.
- Su, N., Si, G. Y., & Zhang, C.-Q. (2019). Mindfulness and acceptance-based training for Chinese athletes: The mindfulness-acceptance-insight-commitment (MAIC) program. *Journal of Sport Psychology in Action*, 10(4), 255-263.
- Teasdale, J. D., Moore, R. G., Hayhurst, H. P., Williams, M., Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in depression empirical evidence. *Journal of Consulting and Clinical Psychology*, 70, 275-287.
- Tops, M., Boksem, M. A., Quirin, M., IJzerman, H., & Koole, S. L. (2014). Internally-directed cognition and mindfulness: An integrative perspective derived from reactive versus predictive control systems theory. *Frontier in Psychology*, 5, 429.
- Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality*, 62, 615-640.

- Weinberg, R. S. (2002). Goal setting in sport and exercise: Research to practice. In J. L. Van Raalte & B. W. Brewer (Eds.), *Exploring sport and exercise psychology* (2nd ed., pp. 25-48). Washington, DC: APA.
- Weinberg, R., Seabourne, T., & Jackson, A. (1982). Effects of vi-quo-motor behavior rehearsal on state-trait anxiety and performance: Is practice important? *Journal of Sport Behavior*, 5, 209-219.
- Whelan, J. P., Mahoney, M. J., & Meyers, A. W. (1991). Performance enhancement in sport: A cognitive behavioral domain. *Behavior Therapy*, 22, 307-327.
- Wolsdorf, B. A., & Zlotnick, C. (2001). Affect management in group therapy for women with posttraumatic stress disorder and childhood sexual abuse. *Journal of Clinical Psychology*, 57 (2), 169-181.
- Zaichkowsky, L. D., & Baltzell, A. (2001). Arousal and performance. In R. N. Singer, H. A. Hausenblas, & C. M. Janelle (Eds.), *Handbook of sport psychology* (2nd ed., pp. 319-339). New York: John Wiley & Sons.
- Zhang, C.-Q., Chung, P.-K., & Si, G. (2017). Assessing acceptance in mindfulness with direct-worded items: The development and initial validation of the Athlete Mindfulness Questionnaire. *Journal of Sport and Health Science*, 6(3), 311-320.
- Zhang, C.-Q., Chung, P.-K., Si, G., & Liu, J. D. (2014). Psychometric properties of the Acceptance and Action Questionnaire–II for Chinese college students and elite Chinese athletes. *Measurement and Evaluation in Counseling and Development*, 47(4), 256-270.
- Zhang, C., Si, G., Chung, P., & Bu, D. (2017). A three-stage adversity coping model for Chinese athletes. *Journal of Sport Psychology in Action*, 8 (2), 87-95.
- Zhang, C. Q., Si, G. Y., Duan, Y. P., Lyu, Y. J., Keatley, D. A., & Chan K. C. (2016). The effects of mindfulness training on beginners' skill acquisition in dart throwing: A randomized controlled trial. *Psychology of Sport and Exercise*, 22, 279-285.

- Zhang, G.Z., Bu, D.R., & Si, G.Y. (2012). Psychological intervention based on Mindfulness-Acceptance-Commitment approach: A mental training paradigm for athletes. *Chinese Journal of Sports Medicine*, 31, 1109-1116.
- Zhang, L. W., & Liang, Z. P. (2002). Athletes' life satisfaction: the contributions of individual self-esteem and collective self-esteem. *Acta Psychologica Sinica*, 34(2), 160-167.



Appendix A: Measures Used in Research

運動員正念量表 (AMQ; Zhang et al., 2017)

姓名：_____ 年齡：_____ 測試日期：_____ 運動項目：_____

以下是一些有關你在訓練或比賽中一些經驗的描述。請根據你最真實的感受來評定每個描述，並圈出每個描述後你所符合的等級數字（1,2,3,4,5）。你的答案沒有對錯之分，只需根據自己的實際情況，如實回答即可。

	1	2	3	4	5
	從 來 沒 有	很 少 這 樣	有 時 這 樣	經 常 這 樣	總 是 這 樣
1. 我能夠很好地將注意力集中在當下的訓練上。	1	2	3	4	5
2. 我能夠接受訓練或比賽中不愉快的想法和感受。	1	2	3	4	5
3. 我能夠很好地意識到訓練或比賽時的情緒在影響自己的想法和行為。	1	2	3	4	5
4. 當訓練或比賽中發生一些意想不到的事情時，我能夠意識到自己當時的情緒狀態。	1	2	3	4	5
5. 當發現自己心不在焉時，我能夠將注意力重新集中在當下的訓練上。	1	2	3	4	5
6. 當訓練或比賽很不順利時，我能夠意識到並接受內心的挫折和煩躁感。	1	2	3	4	5
7. 訓練或比賽時，無論表現好壞，我都可以接受自己。	1	2	3	4	5
8. 訓練或比賽時，我能夠做到放下生活中的負面事件所帶來的不好情緒。	1	2	3	4	5
9. 我能夠很容易地將注意力集中在當下的比賽上。	1	2	3	4	5
10. 當訓練中一些肌肉有疼痛感時，我還是能夠將注意力維持在自己該做的事情上。	1	2	3	4	5
11. 當訓練或比賽的情況發生變化時，我能夠意識到自己當時會有哪些想法和念頭在頭腦中閃過。	1	2	3	4	5
12. 當比賽過程完全出乎意料時，我能夠清楚地覺察到自己的身體反應和變化。	1	2	3	4	5
13. 訓練或比賽時，無論每個想法和感受是否令自己感到舒服，我都會去接納它們。	1	2	3	4	5
14. 注意力分散的情況一閃而過，我能夠很快回到當下的訓練或比賽中。	1	2	3	4	5

15. 訓練或比賽時，我能夠很快意識到自己情緒的變化。 1 2 3 4 5

16. 訓練或比賽時，即使有一些想法和感受是不愉快的或痛苦的，我也能夠與它們和平共處。 1 2 3 4 5

中文版接受與行為量表 II
(CV-AAQ II; Zhang et al., 2014)

姓名：_____ 年齡：_____ 測試日期：_____ 運動項目：_____

下面你將看到一系列的句子，請根據以下等級（1,2,3,4,5,6,7）來評定每句話。請把每句話後最符合你真實想法和感受的等級數字圈出來。你的答案沒有對錯之分，只需根據自己的實際情況，如實回答即可。

1	2	3	4	5	6	7
從來沒有	極少這樣	很少這樣	有時這樣	經常這樣	幾乎總是這樣	總是這樣

1. 痛苦的經驗和記憶會讓我很難去過一種我覺得有價值的生活。 1 2 3 4 5 6 7

2. 我自己的一些感覺會讓我感到害怕。 1 2 3 4 5 6 7

3. 我擔心無法控制自己的憂慮和感受。 1 2 3 4 5 6 7

4. 痛苦的記憶會阻礙我擁有充實的生活。 1 2 3 4 5 6 7

5. 情緒會給我的生活帶來問題。 1 2 3 4 5 6 7

6. 好像大多數人都能夠比我更好地處理自己的生活。 1 2 3 4 5 6 7

7. 憂慮阻礙我的成功。 1 2 3 4 5 6 7

運動員訓練及比賽滿意感
(TCSS; Zhang & Liang, 2002)

姓名：_____年齡：_____測試日期：_____運動項目：_____

以下句子與你對訓練、比賽的感受有關，你可能同意或不同意，請在每一句子後圈出一個數字來表示你贊成的程度。1 代表你完全不同意，7 代表你完全同意，其他數字代表 1 與 7 之間的不同程度。你的答案沒有對錯之分，只需根據自己的實際情況，如實回答即可。

1	2	3	4	5	6	7
完全不 同意						完全同意

1. 在很多方面，我的訓練和比賽情況都接近理想。
2. 我的訓練和比賽在各方面都很好。
3. 我對訓練和比賽感到滿意。
4. 現在我已得到了訓練和比賽中最重要的東西。
5. 總的來說，到現在為止，我的訓練比賽遭透了。
6. 如果可以再選擇一次，我仍希望像現在一樣繼續訓練和比賽。

運動員訓練表現教練評分表

編號	姓名	投入程度	動作質量	動作穩定性	總分
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

注：

請在 1-10 分的範圍內為投入程度，動作品質，動作穩定性打分

投入程度：1 分投入最低，10 分投入最高

動作質量和動作穩定性：1 分代表最差，10 分代表最好。

投入程度：投入的努力、精力與時間，對當前任務的專注，對目標展出的動力與欲望，對困難與挑戰的反應與應對

動作質量：完成動作任務的難度，動作任務完成的力度、精準度、流暢度，運動專項能力（技術、策略）的運用與展現

動作穩定性：出錯的次數，對目標技術、動作、任務完成的百分比

運動員訓練表現自我評分表

姓 名	投入程度	動作質量	動作穩定性

注：

請在 1-10 分的範圍內為投入程度，動作品質，動作穩定性打分

投入程度：1 分投入最低，10 分投入最高

動作質量和動作穩定性：1 分代表最差，10 分代表最好。

投入程度：投入的努力、精力與時間，對當前任務的專注，對目標展出的動力與欲望，對困難與挑戰的反應與應對

動作質量：完成動作任務的難度，動作任務完成的力度、精準度、流暢度，運動專項能力（技術、策略）的運用與展現

動作穩定性：出錯的次數，對目標技術、動作、任務完成的百分比

Appendix B: The MAIC Training Program Used in Study I

Session	Theme	Content
Session 1	Introduction and Psycho-education	Introduction of the entire structure of MAIC; Introduction of the theoretical rationale and specific goals; Introduction of acceptance-based adversity coping; Practice of Brief Centering Exercise; Q & A about practice, explanation; Homework
Session 2	Introducing and Practicing Mindfulness	Introduction of Mindfulness; Story example; Practice of mindfulness Q & A about practice, explanation; Homework
Session 3	Introducing and Practicing Decentering	Introduction of decentering; Ruminated self-orientation to decentered task-orientation; Story example; Mindfulness exercises Q & A about exercise, explanation; Homework
Session 4	Introducing and Practicing Acceptance	Introduction of acceptance; Using acceptance-based adversity coping to facilitate understanding acceptance and avoidance of experiences; Acceptance and nonjudgement of adversity or distractions; Story example; Coexistence exercises; Q & A about exercise, explanation; Homework
Session 5	Introducing Value and Insight	Introduction of value and insight; Understanding the relationship among value, insight, mindfulness, and acceptance; Story example; Instruction of insight to find out value; Q & A about exercise, explanation; Homework
Session 6	Introducing Commitment	Introduction of commitment; Commitment for facing adversity and distractions; Linking commitment to value, insight, mindfulness, and acceptance; Story example; Q & A about exercise, explanation; Homework
Session 7	Comprehensive Review and Consolidation	Summary of the MAIC; Continuous commitment

Appendix C: Informed Consent Forms for Athletes in Study I

THE EDUCATION UNIVERSITY OF HONG KONG Department of Health and Physical Education

CONSENT TO PARTICIPATE IN RESEARCH

(FOR PARTICIPANTS OF STUDY I)

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

I _____ hereby consent to participate in the captioned research supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning.

I understand that information obtained from this research may be used in future research and may be published. However, my right to privacy will be retained, i.e., my personal details will not be revealed.

The procedure as set out in the **attached** information sheet has been fully explained. I understand the benefits and risks involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Name of participant _____

Signature of participant _____

Date _____



INFORMATION SHEET

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

You are invited to participate in a project supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning, who are staff / students of the Department of Health and Physical Education in The Education University of Hong Kong.

This study aims to apply a novel psychological training approach, mindfulness and acceptance-based training approach, among Hong Kong elite adolescent athletes, and examine the efficacy of the training for the athletes, meanwhile, explore the athletes' real experience about the training. As an elite adolescent athlete of the Hong Kong Sports Institute (HKSI), we would like to cordially invite you to participate in this study that will benefit both your psychology and training performance.

In this study, four to six participants in total will be recruited from elite sports teams of the HKSI, and your contact information will be obtained from yourself and your coach through a demographic investigation. This study will include three phases, in terms of a. the baseline phase, b. intervention phase, and c. post-intervention phase. The baseline phase will last two weeks, in which you will be required to take four times self-reported tests about your mindfulness, acceptance, satisfaction, and training performance. The intervention phase will last three weeks, in this phase, a 7-sessions mindfulness and acceptance-based training will be provided for you. Two or three sessions will be conducted in each week, and each session will last about 45 minutes. Meanwhile, you will also be required to take six times self-reported tests that are same as the baseline phase during this three weeks period. The post-intervention phase will last two weeks, in which you will be required to take four times self-reported tests that are same as the baseline phase. There will be no any risk or discomfort for your participation. Moreover, you will benefit from this study for your psychology (e.g., mindfulness, acceptance, and satisfaction) and your training performance.

Your participation in the project is voluntary. You have every right to withdraw from the study at any time without negative consequences. All information related to you will remain confidential, and will be identifiable by codes known only to the researcher.

The results of this study will be potentially disseminated through the researcher's doctoral thesis, academic journals, or conferences. All information you provided will be kept strictly confidential. Only the results of analyses will be reported. In addition, the original data will be deleted within half a year after finishing the research.

If you would like to obtain more information about this study, please contact Mr. Su, Ning at telephone number [REDACTED] or their supervisor Dr. Si, Gangyan at telephone number 2948 8774.

If you have any concerns about the conduct of this research study, please do not hesitate to contact the Human Research Ethics Committee by email at hrec@eduhk.hk or by mail to Research and Development Office, The Education University of Hong Kong.

Thank you for your interest in participating in this study.

Su, Ning
Principal Investigator



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健康與體育教育系

參與研究同意書
(供研究一參與者使用)

香港精英青少年運動員正念-接受心理訓練

本人_____同意參加由姒剛彥博士負責監督,蘇寧先生執行的研究項目。

本人理解此研究所獲得的資料可用於未來的研究和學術發表。然而本人有權保護自己的隱私,本人的個人資料將不能洩漏。

研究者已將所附資料的有關步驟向本人作了充分的解釋。本人理解可能會出現的風險。本人是自願參與這項研究。

本人理解我有權在研究過程中提出問題,並在任何時候決定退出研究,更不會因此而對研究工作產生的影響負有任何責任。

參加者姓名:

參加者簽名:

日期:

有關資料

香港精英青少年運動員正念-接受心理訓練

誠邀閣下參加姒剛彥博士負責監督,蘇寧先生負責執行的研究計劃。她/他們是香港教育大學學生/教員。

本研究旨在為香港青少年精英運動員中提供一項新穎的以正念和接受為基礎的心理訓練,進而檢驗該訓練對於香港青少年精英運動員的功效,同時探索運動員對於此訓練的真實感受。閣下的心理及訓練表現將通過此訓練而受益,作為香港體育學院的青少年精英運動員,我們誠摯地邀請閣下參與本研究。

本研究將從香港體院的精英運動隊招募四至六名參與者。通過對閣下及閣下教練的相關信息調查,我們將獲得閣下的聯繫方式。本研究共包括三個階段的内容,分別為基綫階段、干預階段和干預後階段。基綫階段將持續兩周的時間,期間閣下將參加四次自我報告式的測試,測試用以調查閣下的正念、接受水平,滿足感,以及訓練表現。干預階段將持續三周的時間,在此階段,一項七次課程的正念-接受訓練將被提供給閣下,每周進行二到三次課程,每次課程約四十五分鐘。同時,閣下也將參加六次與基綫階段相同的自我報告式測試。干預後階段將持續兩周的時間,期間閣下將參加四次與基綫階段相同的自我報告式測試。參與本研究對閣下不會有任何風險或不適。而且,通過本研究將使閣下的心理及訓練表現有所收益。

閣下的參與純屬自願性質。閣下享有充分的權利在任何時候決定退出這項研究,更不會因此引致任何不良後果。凡有關閣下的資料將會保密,一切資料的編碼只有研究人員得悉。

本研究的結果可能會被發表在研究者的博士論文、學術期刊或會議上。我們將嚴格保密閣下所提供的一切資訊,只會對數據分析結果進行報告。另外,相關原始數據會在研究結束後半年內銷毀。

如閣下想獲得更多有關這項研究的資料,請與蘇寧先生聯絡,電話 [REDACTED] 或聯絡她/他們的導師姒剛彥博士,電話 2948 8774。

如閣下對這項研究的操守有任何意見,可隨時與香港教育大學人類實驗對象操守委員會聯絡(電郵:hrec@eduhk.hk; 地址:香港教育大學研究與發展事務處)。

謝謝閣下有興趣參與這項研究。

蘇寧
首席研究員



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Appendix D: Informed Consent Forms for Athletes in Study II

THE EDUCATION UNIVERSITY OF HONG KONG Department of Health and Physical Education

CONSENT TO PARTICIPATE IN RESEARCH

(FOR PARTICIPANTS OF STUDY II)

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

I _____ hereby consent to participate in the captioned research supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning.

I understand that information obtained from this research may be used in future research and may be published. However, my right to privacy will be retained, i.e., my personal details will not be revealed.

The procedure as set out in the **attached** information sheet has been fully explained. I understand the benefits and risks involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Name of participant

Signature of participant

Date

INFORMATION SHEET

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

You are invited to participate in a project supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning, who are staff / students of the Department of Health and Physical Education in The Education University of Hong Kong.

This study aims to apply a novel psychological training approach, mindfulness and acceptance-based training approach, among Hong Kong elite adolescent athletes, and examine the efficacy of the training for the athletes, meanwhile, explore the athletes' real experience about the training. As an elite adolescent athlete of the Hong Kong Sports Institute (HKSI), we would like to cordially invite you to participate in this study that will benefit both your psychology and training performance.

In this study, about 40 participants in total will be recruited from elite sports teams of the HKSI, and your contact information will be obtained from yourself and your coach through a demographic investigation. This study will provide a 7-sessions mindfulness and acceptance-based training for you. The training will be conducted once a week, and each session will last about 45 minutes. Meanwhile, you will take three times self-reported tests about your mindfulness, acceptance, satisfaction, and training performance before the training, immediately after the training, and two months later after the end of the training. In addition, immediately after the training, you might also be invited to receive a one-to-one semi-structure interview, the interview will last about 30 minutes. There will be no any risk or discomfort for your participation. Moreover, you will benefit from this study for your psychology (e.g., mindfulness, acceptance, and satisfaction) and your training performance.

Your participation in the project is voluntary. You have every right to withdraw from the study at any time without negative consequences. All information related to you will remain confidential, and will be identifiable by codes known only to the researcher.

The results of this study will be potentially disseminated through the researcher's doctoral thesis, academic journals, or conferences. All information you provided will be kept strictly confidential. Only the results of analyses will be reported. In addition, the original data will be deleted within half a year after finishing the research.

If you would like to obtain more information about this study, please contact Mr. Su, Ning at telephone number [REDACTED] or their supervisor Dr. Si, Gangyan at telephone number 2948 8774.

If you have any concerns about the conduct of this research study, please do not hesitate to contact the Human Research Ethics Committee by email at hrec@eduhk.hk or by mail to Research and Development Office, The Education University of Hong Kong.

Thank you for your interest in participating in this study.

Su, Ning

Principal Investigator



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香港精英青少年運動員正念-接受心理訓練

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參加者姓名:

參加者簽名:

日期:

有關資料

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本研究將從香港體院的精英運動隊招募近四十名參與者。通過對閣下及閣下教練的相關信息調查,我們將獲得閣下的聯繫方式。本研究將為閣下提供一項七次課程的正念-接受訓練。訓練課程每周進行一次,每次約四十五分鐘。同時,閣下還將參加三次有關閣下的正念、接受水平,滿足感,以及訓練表現的自我報告式測試,測試分別會在閣下接受訓練前,訓練結束後即刻,以及訓練結束兩個月後進行。此外,閣下在訓練結束後還有可能被邀請參加一個一對一的半結構式訪談,訪談將持續大約三十分鐘的時間。

參與本研究對閣下不會有任何風險或不適。而且,通過本研究將使閣下的心理及訓練表現有所收益。

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如閣下對這項研究的操守有任何意見,可隨時與香港教育大學人類實驗對象操守委員會聯絡(電郵:hrec@eduhk.hk; 地址:香港教育大學研究與發展事務處)。

謝謝閣下有興趣參與這項研究。

蘇寧
首席研究員



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Appendix E: Informed Consent Forms for Athletes' Parents in Study I

THE EDUCATION UNIVERSITY OF HONG KONG Department of Health and Physical Education

CONSENT TO PARTICIPATE IN RESEARCH

(FOR PARENTS OF PARTICIPANTS OF STUDY I)

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

I _____ hereby consent to my child participating in the captioned research supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning.

I understand that information obtained from this research may be used in future research and may be published. However, our right to privacy will be retained, i.e., the personal details of my child will not be revealed.

The procedure as set out in the **attached** information sheet has been fully explained. I understand the benefits and risks involved. My child's participation in the project is voluntary.

I acknowledge that we have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Name of participant

Signature of participant

Name of Parent or Guardian

Signature of Parent or Guardian

Date



INFORMATION SHEET

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

You are invited to participate with your child in a project supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning, who are staff / students of the Department of Health and Physical Education in The Education University of Hong Kong.

This study aims to apply a novel psychological training approach, mindfulness and acceptance-based training approach, among Hong Kong elite adolescent athletes, and examine the efficacy of the training for the athletes, meanwhile, explore the athletes' real experience about the training. As an elite adolescent athlete of the Hong Kong Sports Institute (HKSI), we would like to cordially invite your child to participate in this study that will benefit both your child's psychology and training performance.

In this study, four to six participants in total will be recruited from elite sports teams of the HKSI, and your contact information will be obtained from your child and your child's coach through a demographic investigation. This study will include three phases, in terms of a. the baseline phase, b. intervention phase, and c. post-intervention phase. The baseline phase will last two weeks, in which your child will be required to take four times self-reported tests about your child's mindfulness, acceptance, satisfaction, and training performance. The intervention phase will last three weeks, in this phase, a 7-sessions mindfulness and acceptance-based training will be provided for your child. Two or three sessions will be conducted in each week, and each session will last about 45 minutes. Meanwhile, your child will also be required to take six times self-reported tests that are same as the baseline phase during this three weeks period. The post-intervention phase will last two weeks, in which your child will be required to take four times self-reported tests that are same as the baseline phase. There will be no any risk or discomfort for your child's participation. Moreover, your child will benefit from this study for his/her psychology (e.g., mindfulness, acceptance, and satisfaction) and training performance.

Your child's participation in the project is voluntary. You and your child have every right to withdraw from the study at any time without negative consequences. All information related to your child will remain confidential, and will be identifiable by codes known only to the researcher.

The results of this study will be potentially disseminated through the researcher's doctoral thesis, academic journals, or conferences. All information your child provided will be kept strictly confidential. Only the results of analyses will be reported. In addition, the original data will be deleted within half a year after finishing the research.

If you would like to obtain more information about this study, please contact Mr. Su, Ning at telephone number [REDACTED] or their supervisor Dr. Si, Gangyan at telephone number 2948 8774.

If you or your child have/ has any concerns about the conduct of this research study, please do not hesitate to contact the Human Research Ethics Committee by email at hrec@eduhk.hk or by mail to Research and Development Office, The Education University of Hong Kong.

Thank you for your interest in participating in this study.

Su, Ning
Principal Investigator



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健康與體育教育系

參與研究同意書
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香港精英青少年運動員正念-接受心理訓練

茲同意敝子弟_____參加由姒剛彥博士負責監督,蘇寧先生執行的研究項目。

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參加者姓名:

參加者簽名:

父母姓名或監護人姓名:

父母或監護人簽名:

日期:

有關資料

香港精英青少年運動員正念-接受心理訓練

誠邀閣下及 貴子女參加姒剛彥博士負責監督,蘇寧先生負責執行的研究計劃。她/他們是香港教育大學學生/教員。

本研究旨在為香港青少年精英運動員中提供一項新穎的以正念和接受為基礎的心理訓練,進而檢驗該訓練對於香港青少年精英運動員的功效,同時探索運動員對於此訓練的真實感受。貴子女的心理及訓練表現將通過此訓練而受益,作為香港體育學院的青少年精英運動員,我們誠摯地邀請貴子女參與本研究。

本研究將從香港體院的精英運動隊招募四至六名參與者。通過對貴子女及貴子女教練的相關信息調查,我們將獲得貴子女的聯繫方式。本研究共包括三個階段的内容,分別為基綫階段、干預階段和干預後階段。基綫階段將持續兩周的時間,期間貴子女將參加四次自我報告式的測試,測試用以調查貴子女的正念、接受水平,滿足感,以及訓練表現。干預階段將持續三周的時間,在此階段,一項七次課程的正念-接受訓練將被提供給貴子女,每周進行二到三次課程,每次課程約四十五分鐘。同時,貴子女也將參加六次與基綫階段相同的自我報告式測試。干預後階段將持續兩周的時間,期間貴子女將參加四次與基綫階段相同的自我報告式測試。參與本研究對貴子女不會有任何風險或不適。而且,通過本研究將使貴子女的心理及訓練表現有所收益。

閣下及 貴子女的參與純屬自願性質。閣下及 貴子女享有充分的權利在任何時候決定退出這項研究,更不會因此引致任何不良後果。凡有關 貴子女的資料將會保密,一切資料的編碼只有研究人員得悉。

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如閣下或 貴子女對這項研究的操守有任何意見,可隨時與香港教育大學人類實驗對象操守委員會聯絡(電郵:hrec@eduhk.hk; 地址:香港教育大學研究與發展事務處)。

謝謝閣下有興趣參與這項研究。

蘇寧
首席研究員



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Appendix F: Informed Consent Forms for Athletes' Parents in Study II

THE EDUCATION UNIVERSITY OF HONG KONG Department of Health and Physical Education

CONSENT TO PARTICIPATE IN RESEARCH

(FOR PARENTS OF PARTICIPANTS OF STUDY II)

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

I _____ hereby consent to my child participating in the captioned research supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning.

I understand that information obtained from this research may be used in future research and may be published. However, our right to privacy will be retained, i.e., the personal details of my child will not be revealed.

The procedure as set out in the **attached** information sheet has been fully explained. I understand the benefits and risks involved. My child's participation in the project is voluntary.

I acknowledge that we have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Name of participant _____

Signature of participant _____

Name of Parent or Guardian _____

Signature of Parent or Guardian _____

Date _____



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In this study, about 40 participants in total will be recruited from elite sports teams of the HKSI, and your child's contact information will be obtained from your child and your child's coach through a demographic investigation. This study will provide a 7-sessions mindfulness and acceptance-based training for your child. The training will be conducted once a week, and each session will last about 45 minutes. Meanwhile, your child will take three times self-reported tests about your child's mindfulness, acceptance, satisfaction, and training performance before the training, immediately after the training, and two months later after the end of the training. In addition, immediately after the training, your child might also be invited to receive a one-to-one semi-structure interview, the interview will last about 30 minutes. There will be no any risk or discomfort for your child's participation. Moreover, your child will benefit from this study for his/her psychology (e.g., mindfulness, acceptance, and satisfaction) and training performance.

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茲同意敝子弟_____參加由姒剛彥博士負責監督,蘇寧先生執行的研究項目。

本人理解此研究所獲得的資料可用於未來的研究和學術發表。然而本人有權保護敝子弟的隱私,其個人資料將不能洩漏。

研究者已將所附資料的有關步驟向本人作了充分的解釋。本人理解可能會出現的風險。本人是自願讓敝子弟參與這項研究。

本人理解本人及敝子弟皆有權在研究過程中提出問題,並在任何時候決定退出研究,更不會因此而對研究工作產生的影響負有任何責任。

參加者姓名:

參加者簽名:

父母姓名或監護人姓名:

父母或監護人簽名:

日期:

有關資料

香港精英青少年運動員正念-接受心理訓練

誠邀閣下及 貴子女參加姒剛彥博士負責監督,蘇寧先生負責執行的研究計劃。她/他們是香港教育大學學生/教員。

本研究旨在為香港青少年精英運動員中提供一項新穎的以正念和接受為基礎的心理訓練,進而檢驗該訓練對於香港青少年精英運動員的功效,同時探索運動員對於此訓練的真實感受。貴子女的心理及訓練表現將通過此訓練而受益,作為香港體育學院的青少年精英運動員,我們誠摯地邀請貴子女參與本研究。

本研究將從香港體院的精英運動隊招募近四十名參與者。通過對貴子女及貴子女教練的相關信息調查,我們將獲得貴子女的聯繫方式。本研究將為貴子女提供一項七次課程的正念-接受訓練。訓練課程每周進行一次,每次約四十五分鐘。同時,貴子女還將參加三次有關貴子女的正念、接受水平,滿足感,以及訓練表現的自我報告式測試,測試分別會在貴子女接受訓練前,訓練結束後即刻,以及訓練結束兩個月後進行。此外,貴子女在訓練結束後還有可能被邀請參加一個一對一的半結構式訪談,訪談將持續大約三十分鐘的時間。參與本研究對貴子女不會有任何風險或不適。而且,通過本研究將使貴子女的心理及訓練表現有所收益。

閣下及 貴子女的參與純屬自願性質。閣下及 貴子女享有充分的權利在任何時候決定退出這項研究,更不會因此引致任何不良後果。凡有關 貴子女的資料將會保密,一切資料的編碼只有研究人員得悉。

本研究的結果可能會被發表在研究者的博士論文、學術期刊或會議上。我們將嚴格保密貴子女所提供的一切資訊,只會對數據分析結果進行報告。另外,相關原始數據會在研究結束後半年內銷毀。

如閣下想獲得更多有關這項研究的資料,請與蘇寧先生聯絡,電話 [REDACTED] 或聯絡她/他們的導師姒剛彥博士,電話 2948 8774。

如閣下或 貴子女對這項研究的操守有任何意見,可隨時與香港教育大學人類實驗對象操守委員會聯絡(電郵:hrec@eduhk.hk; 地址:香港教育大學研究與發展事務處)。

謝謝閣下有興趣參與這項研究。

蘇寧
首席研究員



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of Hong Kong Library

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Appendix G: Informed Consent Forms for Institute

THE EDUCATION UNIVERSITY OF HONG KONG Department of Health and Physical Education

CONSENT TO PARTICIPATE IN RESEARCH (FOR INSTITUTE)

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

My Institute hereby consents to participate in the captioned project supervised by Dr. Si, Gangyan and conducted by Mr. Su, Ning, who are staff / students of the department of Health and Physical Education in The Education University of Hong Kong.

I understand that information obtained from this research may be used in future research and may be published. However, our right to privacy will be retained, i.e., the personal details of my students'/teachers' will not be revealed.

The procedure as set out in the **attached** information sheet has been fully explained. I understand the benefits and risks involved. My students'/teachers' participation in the project are voluntary.

I acknowledge that we have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Signature:

Name of Principal/Delegate*:

Post:

Name of Institute:

Date:

(* *please delete as appropriate*)

(Prof/Dr/Mr/Mrs/Ms/Miss*)



INFORMATION SHEET

Mindfulness and Acceptance-Based Training for Hong Kong Elite Adolescent Athletes

We would like to invite 44 to 46 elite adolescent athletes in total from your institute to participate in a research supervised Dr. Si, Gangyan and conducted by Mr. Su, Ning, who are staff / students of the Department of Health and Physical Education in The Education University of Hong Kong. Meanwhile, Mr. Su, Ning also is a full- time psychology consultant of the department of SPC of the HKSI.

This research project aims to apply a novel psychological training approach, mindfulness and acceptance-based training approach, among Hong Kong elite adolescent athletes, and examine the efficacy of the training for the athletes, meanwhile, explore the athletes' real experience about the training. The project will include two studies, in terms of study I and study II.

In study I, four to six participants will be recruited from elite sports teams of the HKSI, and their contact information will be obtained from themselves and their coach through a demographic investigation. There will be three phases in study I, in terms of a. the baseline phase, b. intervention phase, and c. post-intervention phase. The baseline phase will last two weeks, in which the participants will be required to take four times self-reported tests about their mindfulness, acceptance, satisfaction, and training performance. The intervention phase will last three weeks, in this phase, a 7-sessions mindfulness and acceptance-based training will be provided for the participants. Two or three sessions will be conducted in each week, and each session will last about 45 minutes. Meanwhile, the participants will also be required to take six times self-reported tests that are same as the baseline phase during this three weeks period. The post-intervention phase will last two weeks, in which the participants will be required to take four times self-reported tests that are same as the baseline phase.

In study II, about 40 participants in total will be recruited from elite sports teams of the HKSI, and their contact information will be obtained from themselves and their coach through a demographic investigation. This study will provide a same training as study I for the participants. The training will be conducted once a week, and each session will last about 45 minutes. Meanwhile, the participants will take three times self-reported tests about your mindfulness, acceptance, satisfaction, and training performance before the training, immediately after the training, and two months later after the end of the training. In addition, immediately after the training, part of the participants might also be invited to receive a one-to-one semi-structure interview, the interview will last about 30 minutes.

There will be no any risk or discomfort for the participants. Moreover, the participants will benefit from this study for their psychology (e.g., mindfulness, acceptance, and satisfaction) and training performance.

The athletes' participation in the project is voluntary. They have every right to withdraw from the study at any time without negative consequences. All information related to them will remain confidential, and will be identifiable by codes known only to the researcher.

The results of this study will be potentially disseminated through the researcher's doctoral thesis, academic journals, or conferences. All information the participants provided will be kept strictly confidential. Only the results of analyses will be reported. In addition, the

original data will be deleted within half a year after finishing the research.

If you would like to obtain more information about this study, please contact Mr. Su, Ning at telephone number [REDACTED] or their supervisor Dr. Si, Gangyan at telephone number 2948 8774.

If you have any concerns about the conduct of this research study, please do not hesitate to contact the Human Research Ethics Committee by email at hrec@eduhk.hk or by mail to Research and Development Office, The Education University of Hong Kong.

Thanks so much for your support. We are looking forward to your kind cooperation.

Su, Ning
Principal Investigator



香港教育大學
健康與體育教育系

參與研究同意書(合作機構)

香港精英青少年運動員正念-接受心理訓練

本校同意參加由姒剛彥博士負責監督,蘇寧先生負責執行的研究計劃。她/他們是香港教育大學學生/教員。

本人理解此研究所獲得的資料可用于未來的研究和學術發表。然而本人有權保護本校學生/教師的隱私,其個人資料將不能洩漏。

研究者已將所附資料的有關步驟向本人作了充分的解釋。本人理解可能會出現的風險。本人是自願讓本校學生/教師參與這項研究。

本人理解本人及本校學生/教師皆有權在研究過程中提出問題,并在任何時候決定退出研究,更不會因此而對研究工作產生的影響負有任何責任。

簽署:

校長/ 學校代表*姓名:

職位:

學校名稱:

日期:

(*請刪去不適用者)

(教授/博士/先生/女士/小姐
*)

有關資料

香港精英青少年運動員正念-接受心理訓練

我們誠邀貴院四十四至四十六名青少年精英運動員作為研究參與者，參加由姒剛彥博士負責監督，蘇寧先生執行的研究項目。她/他們是香港教育大學學生/教員。蘇寧先生亦是貴院運動心理中心的全職心理諮詢師。

本研究課題究旨在為香港青少年精英運動員中提供一項新穎的以正念和接受為基礎的心理訓練，進而檢驗該訓練對於香港青少年精英運動員的功效，同時探索運動員對於此訓練的真實感受。本課題將包括兩個研究，即研究一與研究二。

研究一將從香港體院的精英運動隊招募四至六名參與者。通過對他們及他們教練的相關信息調查，我們將獲得他們的聯繫方式。研究一共包括三個階段的內容，分別為基綫階段、干預階段和干預後階段。基綫階段將持續兩周的時間，期間參與者將參加四次自我報告式的測試，測試用以調查他們的正念、接受水平，滿足感，以及訓練表現。干預階段將持續三周的時間，在此階段，一項七次課程的正念-接受訓練將被提供給閣下，每周進行二到三次課程，每次課程約四十五分鐘。同時，參與者也將參加六次與基綫階段相同的自我報告式測試。干預後階段將持續兩周的時間，期間參與者將參加四次與基綫階段相同的自我報告式測試。

研究二將從香港體院的精英運動隊招募近四十名參與者。通過對他們及他們教練的相關信息調查，我們將獲得參與者的聯繫方式。研究二將為參與者提供一項與研究一相同的訓練。訓練課程每周進行一次，每次約四十五分鐘。同時，參與者還將參加三次有關閣下的正念、接受水平，滿足感，以及訓練表現的自我報告式測試，測試分別會在閣下接受訓練前，訓練結束後即刻，以及訓練結束兩個月後進行。此外，部分參與者在訓練結束後還有可能被邀請參加一個一對一的半結構式訪談，訪談將持續大約三十分鐘的時間。

參與本研究課題對參與者不會有任何風險或不適。而且，通過本研究課題將使參與者下的心理及訓練表現有所收益。

貴院運動員參與本研究課題純屬自願性質。參與者享有充分的權利在任何時候決定退出這項研究，更不會因此引致任何不良後果。凡有關參與者的資料將會保密，一切資料的編碼只有研究人員得悉。

本研究課題的結果可能會被發表在研究者的博士論文、學術期刊或會議上。我們將嚴格保密參與者所提供的一切資訊，只會對數據分析結果進行報告。另外，相關原始數據會在研究結束後半年內銷毀。

如貴院想獲得更多有關這項研究的資料，請與蘇寧先生聯絡，電話 [REDACTED] 或聯絡她/他們的導師姒剛彥博士，電話 2948 8774。

如貴院對這項研究的操守有任何意見，可隨時與香港教育大學人類實驗對象操守委員會

聯絡(電郵: hrec@eduhk.hk; 地址:香港教育大學研究與發展事務處)°

期望能得到貴院對本研究支持。非常感謝和期待與貴院的合作！

蘇寧

首席研究員

