

2023-04-27

# Evaluation of the LTD program on the psychological development in athletes

McLean, Maxime

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McLean, M. (2023). Evaluation of the LTD program on the psychological development in athletes (Master's thesis, University of Calgary, Calgary, Canada). Retrieved from <https://prism.ucalgary.ca>.  
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UNIVERSITY OF CALGARY

Evaluation of the LTD program on the psychological development in athletes

by

Maxime McLean

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE

DEGREE OF MASTER OF SCIENCE

GRADUATE PROGRAM IN KINESIOLOGY

CALGARY, ALBERTA

APRIL, 2023

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## ABSTRACT

The Long-Term Development (LTD) model is utilized by multiple National Sport Organization (NSO) to aid in the development and progression of individuals who partake in physical activity.

The LTD model consists of 7 stages (Active Start; FUNdamentals; Learn to Train; Train to Train; Train to Compete; Train to Win; Active for Life) which track and progress various skills during target training times to aid in improving performance. The LTD model works on developing five elements of sport which consists of physical, technical, tactical, psychological, and emotional skills. Under the current LTD model, there lacks research on the Psychological Skills Training (PST) that are implemented throughout the stages of development. A content analysis was conducted to determine upper level categories in regards to PST for determining the type of psychological skills being prescribed at the Train to Train; Train to Compete; Train to Win stages. Twelve upper level categories were found through this content analysis 1) *Individual Psychological Preparation*, 2) *Psychological Skills Development*, 3) *Competition Plans & Routines*, 4) *External Factors*, 5) *Arousal, Anxiety and Stress Management*, 6) *Communication*, 7) *Sport Enjoyment*, 8) *Self-Talk*, 9) *Goal Setting*, 10) *Imagery/Visualization*, 11) *Teamwork Components*, 12) *Focus/Refocus*. An evaluation of these categories and the progression between the stages being analyzed were shown to have inconsistencies in progression and prescription. An analysis to determine the prevalence of PST in various sport types (Individual; Team; Combative; Artistic) was also completed. Findings show a lack of regularity in PST recommendation throughout both stages and sport types. Intentional practice and consistency should be advised to ensure adequate understanding and utilizing PST.

## ACKNOWLEDGMENTS

I would like to thank my supervisor Dr. Dave Paskevich for his wise insight and mentorship throughout the past few years. There have been many obstacles throughout this research which would not have been possible without his support and determination.

I would also like to acknowledge my committee members, Dr. Cari Din and Dr. Kim Dorsch for being resources and aiding in the thought process and feedback throughout this process.

I will be forever grateful for the support from my friends during this degree. Thank you Daimhin, for always being there for me and supporting me no matter what, to Jenna, for being a bright light on cloudy days, to Ryleigh, to always giving me a reason to laugh; to Mackenzie, for providing support provinces away. Thank you to my roommates, who were supportive during the stressful moments that occurred throughout the past few years.

I would like to thank the city of Fernie, British Columbia for being a new environment to help inspire ideas and aid in concentration. Finally, to my family, you are the reason I have made it through this degree. Your love and support are everything to me and words cannot describe the gratitude I will forever have to all of you. Mom, thank you for being my biggest cheerleader and always picking me up when I was down. Dad, you inspired me to work my hardest and always believed in me. Thank you both for raising me and equipping me with the skills to succeed.

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## **Chapter One: Introduction**

### **Long-Term Development**

One major purpose for the creation of athlete development models is to allow for the proper training (i.e., develop), tracking (i.e., monitor) and evaluation (i.e., provide feedback) of physical, technical, tactical and mental skills with the purpose of optimizing athlete performance (Balyi, 2004). The desire for athletic success and dominance is idealized by many sports, organizations, and nations, which has led researchers to begin discovering new ways in facilitating athlete development. This research has laid the foundation for what is now the Long-Term Athlete Development (LTAD) model.

Ericsson and colleagues (Ericsson, 1996; Ericsson et al., 1993) explored the concept of expert practices, emphasizing that deliberate, extended practice increases ones' chances to be successful in their desired environment (e.g., sports, arts, and education). Based on their research, Ericsson and colleagues suggested that deliberate practice and early specialization were key elements in achieving athletic success (Ericsson, 1996; Ericsson et al., 1993). While these elements are undoubtedly true, further research in this area has suggested there are other elements which can also positively impact the development and success of athletes. These include deliberate play, role of peers/parents, and diverse play (Abbott & Collins, 2004; Bailey & Morley, 2006; Côté, 1999; Durand-Bush & Salmela, 2002; Morgan & Giacobbi, 2006). All of these factors may play a part in the development, maintenance, and progression of both physical and psychological skills in the athletic population.

Creating a model which focused on the development of various athletic skills (i.e., physical, technical, tactical, mental, and emotional) was the foundation for the LTAD model.



The LTAD model was built off of the training regime of UK elite swimmers, who followed a specific training program in order to hit target training areas within their development and achieve superior performance. Results of this training regime were brought to the National Coaching Institute in the 1990's and began a new wave of training to enhance Canada's athletic performance (Balyi, 2004).

The LTAD model consists of seven stages (i.e., Active Start; FUNdamentals; Learn to Train (L2T); Train to Train (T2T); Train to Compete (T2C); and Train to Win (T2W): and Active for Life) which focus on developing five elements of sport: Technical, Tactical, Physical, Psychological, and Emotional. As individuals enter the model (i.e., Active Start, FUNdamentals, and L2T), the primary focus is to develop foundational, general sport skills (e.g., running, jumping, and swimming). As individuals progress through the stages (i.e., T2T, T2C, and T2W), there is an increased focus on sport specific skills and performance. This shift in focus of training is done with the expectation of developing wholistic, well-rounded athletes who can achieve podium results. In a variety of sports, there is sufficient research and background to support the physical, technical, and tactical development of athletes (Black & Holt, 2009; Lang & Light, 2010; Ford et al., 2011). However, there is less research surrounding the training, delivery and maintenance surrounding the psychological and emotional components of athletic development (Milavic et al., 2019).

The creation of a LTAD model allows athletes, coaches, and sport organizations to account for multiple athletic factors and develop training programs related to their respective development model. Researchers began the conversation of analyzing the athlete developmental age (i.e., to the age of the individuals in reference to their environment from a physical and mental standpoint) and not just their chronological age (Balyi, 2004). The inclusion of

developmental age allowed coaches, practitioners, and athletes to account for growth-related differences (e.g., hormones, growth, and muscular build) when developing plans for athletes to follow throughout a practice and/or season. This allowed for the creation of a tailored training regime which allows each athlete to improve based on their skills and requirements (Visek et al., 2013).

Balyi (2004) proposed that throughout an athlete's development, there are "windows of opportunity" that needed to be targeted for specific training to see improvement in their desired sport. The research indicated that teaching skills during windows of opportunity allowed athletes the opportunity to have greater success in their sport (Higgs et al., 2019). Accordingly, sport organizations have been creating their own sport-specific model to target these identified training zones in which certain skills need to be taught and when athlete peaks may occur. In Canada, the model has often been known as the LTAD (Balyi, 2004), however, in 2018, the name changed to the Long-Term Development (LTD) model in an effort to be more inclusive towards all individuals who wish to participate in sport, not just those who identify as athletes (MacNeil et al., 2014). For the purpose of this thesis, the model throughout this manuscript will now be referred to as the LTD.

A significant factor in determining the efficacy of any LTD model is its knowledge translation and compatibility to its desired sport group. As one of the benefits of the LTD is its accessibility and adaptability to all sports, it can sometimes also cause disorganization and misinterpretation (Black et al., 2009; Lang et al., 2010). It is important that National Sport Organizations (NSOs') be adaptive in creating their psychological skills training to be specific to the needs of their respective sport in order to see positive responses in the psychological ability of their athletes (Banack et al., 2012; Ford et al., 2011). Based on each sports peak age

(e.g., gymnastics, 14-18 years old), physical (e.g., hockey, being cleared through pre-season training before the competitive season starts) and mental (e.g., tennis, the ability to bounce back after a lost serve) requirements, each sport LTD will highlight different constructs (e.g., concentration and anxiety management) and prioritize these based on the needs of the athletes and the LTD stage. The LTD model has continually evolved since its origination, and has become much more dynamic in its use in the sport environment. There is still additional work that needs to be done to make the model more effective in the respective sport frameworks, however, the growth of the model indicates that improvements will continue to be made and will add benefit to the success and development of athletes.

### **Psychological Skills Training**

It is important to understand the effect psychological skills training (PST) has on athletes and see how this impacts their ability to optimize their performance (Higgs et al., 2019). While developing a strong PST base can improve an athlete's performance, it can also have a positive impact on the athlete's experience in sport (Norris, 2010). Research has found that the implementation of PST in adolescent athletes may promote coping skills and confidence in their formative years as they mature (Sheard & Golby, 2006). A number of research studies have publicized the benefits of PST and its impact on athlete performance and outcomes (Blijlevens et al., 2018; Fletcher & Hanton, 2001; Larsen et al., 2012; Orlick & Partington, 1988; Pankow et al., 2020; Visek et al., 2013; Weinberg & Comar, 1994). Additionally, the value and impact of PST has been recognized by many athletes as contributing to their athletic success at various international competitions (e.g., National Championships, World Cups, and Olympics) (Orlick & Partington, 1988). Olympic athletes have spoken to the beneficial impact PST has had in their

ability to deliver peak performances resulting in podium finishes at international competitions (Gould et al., 2002; Gould & Maynard, 2009).

A training regimen involving psychological skills helps foster and develop mentally fit individuals, which is crucial for athletic success. Thus, it seems important to develop these foundational mental skills (e.g., relaxation, energization, visualization, concentration, and self-talk) early in the athletic pathway (i.e., Active Start; FUNdamentals; and L2T) in order for athletes to optimize their use of mental skills in the latter three stages of the LTD model (i.e., T2T, T2C, and T2W) where athletes are beginning to mature into adolescence and later transitioning into adulthood (13-18+ year-old range). Early exposure to PST in adolescent athletes has shown positive impacts on competitive performance and athletes adherence in their respective sports (Sheard & Golby, 2006). The implementation of psychological skill techniques such as goal setting, imagery, relaxation, and stress management have shown to benefit physical abilities as well as self-confidence and self-esteem (Tremayne & Tremayne, 2004).

Using PST can create a positive and efficient working environment in which the athlete is able to thrive, and while the value of PST is well known and acknowledged by the athletic community, there still lacks the implementation of consistent and systematic PST within a practice and season (Cumming & Hall, 2002; Greenleaf et al., 2001; Orlick & Partington, 1988). Systematic and consistent training and practice are required to firmly establish psychological skills which can aid in the development of self-confidence and create positive impacts on the performance of athletes (Hanton et al., 2005). Thus, individual sport organizations and sport governing bodies should optimize the effectiveness of PST by implementing their PST strategy within a well thought out and developed training program.

## **Statement of the Problem**

In Canada, there lacks research analyzing the content of PST proposed within our NSO's T2T, T2C, and T2W stages. Through analysis of psychological skills reported by various NSO LTD models the aim is to compare the psychological skills prescribed in the final three stages of development (T2T, T2C, and T2W) within and across NSOs. With this information, the content of the PST currently being prescribed within the developmental requirements of each stage will be more fully understood.

## **Significance**

The ability to deliver “best in class” PST programs to high performance athletes (i.e., those in the T2T, T2C, and T2W stages) can only take place with a better understanding of what NSOs are prescribing to their athletes. The use of the content analysis will provide insight into the current landscape of PST recommendations within the daily training and competitive environments of Canadian high-performance athletes. As sport is comprised of more than just physical, technical and tactical skills, it essential that high performance athletes be exposed to and develop psychological skills. This research will bring to light the importance of identifying psychological skills thought to be important in the final three stages of the LTD model (i.e., T2T, T2W, and T2C stages) across NSOs.

## **Purpose**

The purpose of this research is to examine the current state of the PST being prescribed by NSO's during the three final stages of the LTD model (i.e., T2T, T2C, and T2W). Through the use of a content analysis, NSO LTD models will be analyzed to determine which psychological skills they are prescribing in these three final stages.

## **Research Design**

Beginning with a content analysis of various LTD models, the aim is to provide an overview of the psychological skills being prescribed throughout the various NSOs' LTD models. The sample of sport LTD models were taken from the Canadian Sport 4 Life (CS4L) website. The CS4L philosophy which is aligned with the LTD, sets the foundation of sport organizations within in the CS4L to be rooted by the development model of the LTD. Thus, the sample examined is comprised of the sports listed on the CS4L website. the psychological skills of each NSO (e.g., specific sports such as volleyball or basketball) will be examined the psychological skills being prescribed at each stage of development. Separately, a content analysis was done on the T2T-T2C-T2W stages of development (i.e., examine skills being prescribed across all the sports at each of these levels), as well as examining sport types (i.e., Individual, Team, Combative, and Artistic) which would identify the psychological skills that were identified by NSO's as being important to be delivered at each of the three stages (i.e., T2T, T2C, and T2W). For purposes of simplicity, upper-level categories were developed to categorize the psychological skills.

## **Definitions**

In this section, definitions of the key terms will be defined in order to provide clarity regarding the main focuses of this research.

Long-Term Development: A model used to track and systematically identify crucial training periods while also integrating key training skills to aid in performance ( Higgs et al., 2019). The basis of this model is to provide a framework in which overall development is prioritized throughout the progression of all individuals participating in physical activity.

Psychological Skills Training: These are skills that focus on increasing psychological abilities of athletes. It provides individuals with a variety of skills to aid in performance in addition to the technical, tactical, and physical skills.

Train to Train (T2T): In this stage, individuals range from the ages 11-15 in females and 12-16 in males (Higgs et al., 2019). It is considered a transition stage as athletes begin maturing and shift into adulthood. It is a critical stage in development as it maps out the future direction of the athlete's journey through sport (Higgs et al., 2019). Individuals can choose to either continue on in the sport and train at a high-performance level, working towards the Podium Pathway; or continue in recreational levels of sport or drop out of the sport. A focus of this stage is to begin the refinement of skills while also incorporating more targeted training (i.e., sport specialization). As this is a maturation stage, training is also targeted to properly identify crucial training moments in regards to Peak Height Velocity (PHV) and the individual's growth spurt (Higgs et al., 2019). This stages' skill set is focused on developing and refining skills to be more geared towards the individuals desired sport.

Train to Compete (T2C): In this stage, individuals have surpassed their growth spurt and often are on track for national and/or international ranking. For females, traditionally ages range from 16-18 and for males, 17-19. This stage begins the focus on sport specific training, while using additional training (i.e., fitness, physical, and mental) as a secondary source (Higgs et al., 2019). This is done in order to enhance the individual's capabilities in their specific sport environment. Furthermore, there is an increase in competitions in this stage in order to test and train individuals to adapt and perform under pressure situations (Higgs et al., 2019). The focus of this stage is to elevate the performance and training of individuals in order to properly prepare for the upcoming demands in this stage and future stages.

Train to Win (T2W): This stage is primarily focused on achieving national and international excellence (Higgs et al., 2019). For the females, participants are often aged 20+ in this stage whereas men are 21+. This stage is geared towards refining and consolidating skills towards achieving the highest performance and national/international success (Higgs et al., 2019). Skills are being taught and practiced prioritizing optimal performance and performing a winning style of play. There is a larger emphasis on participating in competitions, in order to consolidate skills in the realistic environments to allow individuals to adapt and control the pressure (Higgs et al., 2019).

Content Analysis: A qualitative method used to analyze data and interpret its meaning. A successful content analysis consists of systematic research which leads to the development of categories, models, and/or a conceptual map (Dixon-Woods et al., 2005; Elo et al., 2014). The research question in a content analysis signifies what the analysis is looking at and what is being created. Through the analysis, concepts are extracted to provide description of the contents being analyzed.



## **Limitations/Delimitations**

This study uses the LTD models provided by various NSOs. With this, the findings reflect what each NSO have published on their website regarding their LTD model. The categories generated in the content analysis are created through the psychological skills that NSOs state they are prescribing to their athletes in the various stages of development. However, no information about what is actually being delivered to athletes in these sport environments regarding PST can be ascertained from this study.

## Chapter Two: Review of Literature

### Psychological Skills Training

The use of PST has connected mental toughness and psychological development to increased performance in a variety of athletes (Golby & Wood, 2016; Sheard & Golby, 2006). Psychological skills training refers to the “systematic and consistent practice of mental or psychological skills for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and physical activity self-satisfaction” (Weinberg & Gould, 2007, p. 250). There is an assortment of constructs that PST target (e.g., self-talk, confidence, visualization, relaxation, coping skills, goal setting, and athletic plans/routines) that work together to increase the psychological fitness of athletes. In order to have athletic success, the development of wholistic athletes is needed, therefore, it is important to train both physical and psychological skills. While there is sufficient research analyzing the impact of physical skills on athletic success, there is less looking at the psychological skills that relate to athletic success (Dohme et al., 2020; Spink, 1990).

As the margin of error is becoming progressively smaller at the elite level of sport, the demand and usage of PST is seen by many to provide a performance advantage (Birrer & Morgan, 2010). The implementation of PST into an athlete’s training regime provides them with a strong set of skills in order to consistently compete at the highest level. It can also be a separating factor between elite athletes and assist in success at important international meets (Birrer & Morgan, 2010).

It is important to ensure that the individuals partaking in PST are given the foundational tools and consistent practice in order to learn and execute the skills to the fullest extent. It has been suggested that implementing PST during the developmental years (i.e., consolidating and

developing skills in athletes) could relate to better coping skills as the athletes mature (Lane et al., 2004). Introducing psychological skills to developing athletes would allow for greater practice of these skills and would help the long-term refinement of these skills for athletes (Harwood et al., 2004). Athletes are working at developing both physical and psychological sport specific skills as they enter the Train to Train stage of development (MacNeil et al., 2014). Thus, incorporating PST in their training regime would provide the athletes with the appropriate opportunities to see progression and success with these skills. Skills such as self-confidence, anxiety control, and the ability to focus/refocus have been identified in Olympic athletes which enabled them to perform successfully under high pressure and stressful situations (Gould et al., 1992; Fletcher & Sarkar, 2012; Orlick & Partington, 1988). Athletes with well-developed psychological skills are capable of performing at their best during international competitions (Fletcher & Sarkar, 2012). It was also noted that through the development and maintenance of psychological skills, athletes were seen to be more resilient, which in turn aided in their ability to perform and overcome obstacles in crucial moments (Fletcher & Sarkar, 2012).

It has been acknowledged by those involved in sport (e.g., coaches, athletes, and mental performance consultants) that integrating PST into an athlete's training is crucial in order to see consistent athletic improvement (Boes et al., 2014; Gould & Maynard, 2009; Jones et al., 2002; Orlick & Partington, 1988). The chronological age in which PST is introduced and integrated into the training regime of athletes can impact the development and success of these athletes (Pankow et al., 2020). Starting PST with athletes at a younger age allows athletes, coaches and mental performance consultants to monitor and evaluate the development of these psychological skills as the athletes' progress. Consistent practice of these psychological skills is another key element to the efficacy and efficiency of these skills (Blijlevens et al., 2019; Pankow et al., 2020).

Developing a better understanding of how PST is developed, delivered, monitored, and evaluated are fundamental in the value of the skills (Foster et al., 2016; Golby & Wood, 2016).

Many high performance athletes attribute their success to the development and usage of PST (MacNeil et al., 2014). In the proposed study, the three later stages, T2T, T2C, and T2W directly relate to the development and consolidating stages of athletes who are working towards podium performances at National and International competitions. There is an extensive body of literature examining the relationship between PST and talented, successful elite/high performing athletes (Black & Holt, 2009; Collins et al., 2019; Gould & Maynard, 2009; MacNamara et al., 2010; MacNamara & Collins, 2013; Pankow et al., 2020).

A key aspect to effective PST is the quality training an athlete is exposed to in order to increase their confidence surrounding their preparation and competition routines (Orlick & Partington, 1988). This preparation increases an athlete's mental readiness prior to competing, allowing athletes to perform with greater self-confidence. Mamassis and Doganis (2004) provided evidence that teaching and educating youth tennis athletes on psychological skills can help eliminate performance weaknesses, resulting in increased self-efficacy. By incorporating PST of skills such as goal setting, positive self-talk, and imagery, results showed that athletes were more confident in subsequent competitions and therefore saw improvements in their performance (Mamassis & Doganis, 2004).

It has also been acknowledged by a variety of athletes from the National Olympic Training Center in Norway that while physical attributes are key to athletic performance, psychological skills are crucial to success (Boes et al., 2014). Findings from this study indicated that PST should be implemented in training to be fully functional in a competition setting (Boes et al., 2014). Fournier et al. (2005) found that the addition of psychological skills enhanced the

efficacy of physical skills. Integrating both physical and psychological skill building into an athletes training regime aided in the holistic development of athletes (Fournier et al., 2005). Gould and Maynard (2009) found that PST can also benefit athletes in various high stress conditions (i.e., team trial, and mock competitions) by providing the athletes with the skills to adapt to stressful situations, cope with anxiety, and utilize positive imagery/visualization. These findings support the research done by MacNeil et al. (2014) confirming that incorporating PST into an athletes training regime provided athletes with the sufficient tools to successfully prepare for competitions at the highest level (Gould & Maynard, 2009; Orlick & Partington, 1988).

Blijlevens et al. (2018) found that there is a need to teach and evolve psychological skills and characteristics throughout an athletic career. As their sample of gymnasts progressed through their development, the requirement of certain psychological skills became more pertinent and therefore resulted in a shift of PST in order to meet those needs (Blijlevens et al., 2018). It was found in the “initiation phase” (beginning of LTD stages) that athletes should focus on “maximizing their potential” (p. 76) ; as they progressed to the “developmental stage”(similar to T2T & beginning of T2C), that athletes add “working with their environment” (p. 80) and, in the “Mastery stage” (p. 81) (i.e., similar to the end of T2C & T2W), that athletes combine the previous two skills with “delivering high performance” (p. 208) (Blijlevens et al., 2018). Ensuring athletes were introduced and taught specific psychological skills at targeted times allowed the athletes to properly develop the skills as they were relevant to the current demands of their sport (Blijlevens et al., 2018).

Research by Pankow et al. (2020) found that psychological skills evolved as the athletes’ progressed through the developmental levels of their sport (i.e., Junior to professional hockey). Pankow et al. (2020) analyzed three areas of development (i.e., minor hockey, junior hockey and

professional hockey) which are stages similar to the one's found in the LTD model (i.e., T2T, T2W, and T2C) (Pankow et al., 2020). Results indicated that different stages of development elicited different psychological skills. Psychological skills in minor hockey were oriented more towards the development and formation of a socially supportive environment for the athletes to thrive in. In junior hockey players, psychological skills training focused on primarily on the development of athlete characteristics, tied to experience and success. Finally, professional hockey players were developing and refining performance focused psychological skills, while also actively learning from the environment around them (i.e., teammates and coaches).

It was noted by Pankow et al. (2020) that foundational psychological skills (i.e., goal setting, visualization, and confidence) in PST were developed before moving on to performance-oriented skills. Creating a strong set of psychological skills to build a long-lasting base allows athletes to scaffold additional psychological skills and characteristics as they develop and progress through their sport. Psychological characteristics are defined as considerably stable attributes in various environments, whereas psychological skills are learned abilities which are used to enhance psychological characteristics (Dohme et al., 2017; Pankow et al., 2020). Pankow et al. (2020) also found that the chronological sequence of PST was beneficial in the comprehension and application of these psychological skills for the athletes. These findings indicate that psychological skills should be taught in a progressive manner from minor hockey to the professional ranks, as well as aligning with the needs of their identified stage. Pankow et al. (2020) referred back to Hockey Canada's LTD model and noted that their findings were inconsistent with the skills prescribed by Hockey Canada. The researchers found that their participants viewed the development of psychological characteristics at a higher weight in comparison to psychological skills. However, as prescribed by the Hockey Canada LTD model,

psychological skills (i.e., goal setting, visualization, focus, self-awareness and independence) were the focus of their development model. The research indicated that athletes found themselves being taught psychological characteristics (i.e., interpersonal and individual psychological characteristics and performance-oriented psychological characteristics) which indicated inconsistencies with the prescribed skills and the skills being taught as suggested by Hockey Canada.

Determining the alignment between what is being prescribed to the athletes (i.e., LTD model) and what is currently going on (i.e., athlete perspective) is crucial in order to see an effective use of psychological skills training and progression. Studies by both Blijlevens et al. (2019) and Pankow et al. (2020) showed similar findings regarding the progression and development of psychological skills in athlete development, supporting the notion that consistent monitoring, evaluation, and clarity of psychological skills are essential to have a positive effect and allow athletes the opportunity to gain all the benefits from these psychological skills at the correct stage.

The importance of introducing PST to athletes by coaches and/or Mental Performance Consultants (MPCs) while they are still in the developmental stage of progression allows for the development of a foundational base of psychological skills that athletes can build upon (Foster et al., 2016). Teaching and educating athletes psychological skills requires diagnosis (e.g., gap analysis) to understand and prescribe skills based on each athlete's individual needs (Foster et al., 2016). Teaching towards the individual characteristics of the athletes (i.e., age, maturity, development, and stage in sport) is referred to in sport psychology as matching. Foster et al. (2016) found that the interaction between MPCs and athletes provided the consultants with the proper information as to which skills were needed for each athlete (i.e., sport psychology

matching), based on their skills and maturational age when working with “youngsters” (i.e., athletes <12 and from 12-18).

It was also noted by Foster et al. (2016) that proper delivery of skills to the athletes based on their chronological age supported an athlete’s understanding of these skills. Likewise, the PST program athletes were introduced to should also be associated with their maturational age as it provided a base for them to develop further skills (Foster et al., 2016). The research of Foster et al. (2016) is supported with similar findings from Pankow et al. (2020) who also stated that that PST should be tailored to the maturational and developmental needs of the athletes in order to be effective as it allows the athlete to work on the proper psychological skills at the correct time of their training stage. Targeted training (i.e., based on age and stage) provides a base to allow for the evaluation, monitoring and progression of psychological skills of the athletes.

Equipping athletes with the correct skills to regulate and control their thoughts and emotions is a key factor to the progression and development in sport (Dohme et al., 2020). These researchers were looking at the relationship between psychological skills and characteristics (PSC) and youth athlete development. The goal was to identify the PSCs that were seen as facilitative to the research sample (i.e., youth tennis athletes). It was seen in the development, intervention and evaluation of the Mental Skills Training Program on elite youth tennis athlete that psychological development should be personalized, relative to the athlete’s needs, and age appropriate in order to provide benefit (Dohme et al., 2020). In turn, these researchers found increased self-awareness, confidence, and motivation in the athletes as the psychological skills which allowed them to self-regulate and make educated decisions based on their psychological needs (Dohme et al., 2020).



The idea of monitoring, evaluating, and progressing psychological skills throughout athletic development is crucial as it allows the athletes to understand the process of PST and target the desired requirements based on their age, maturity, and development. It was also noted in the research done by Dohme et al. (2020) that PST helped athletes deal with the challenges and stressors of elite sport, and positively impacted their ability to succeed (Dohme et al., 2020). In summary, evaluating the needs of athletes at the individual level can provide insight on the necessary skills that should be taught. When developing PST programs for athletes, the training should provide time to monitor and adaptively manage these skills in order to see optimal benefits.

Keegan et al., (2020) found the transition into different development pathways led to adjusting and progressing PST to match the requirements at the stage (e.g., confidence levels from T2T to T2C). A sample of MPC's were interviewed to understand the relationship between research and applied psychological skills. It was expressed by the MPC's that adjusting their delivery based on the development and maturity of athletes is key to see progression through the sport. Also, to develop what Keegan et al. (2020) calls the "Winning Edge" (p. 5), incorporating progression on already learned skills while also teaching skills relevant to the specific stages' requirements can benefit an athlete's development (Keegan et al., 2020). A primary focus of the "Winning Edge" strategy is to prepare athletes' as they transition to a higher level or into another pathway of sport (e.g., from provincial to national team). Keegan et al. (2020) stated that skills must be developed and nurtured, while also evolving with the needs of the athlete to target the requirements of the level of sport they are currently at or working towards. It is important to follow and match the PST to the needs of the athletes. In order to see optimal progression, skills should be specific and targeted to allow the skills to grow with, and be consolidated by, the

athletes. Therefore, if skills need to be individualized based on an athlete's needs, a more dynamic and adaptable reference model is needed.

A similar trend was seen in research completed on elite and non-elite Croatian volleyball players (Milavic et al., 2019). The Psychology Skills Inventory for Sport (Youth Version) Short form (PSIS-Y- SF) was created in order to distinguish the psychological skills between a variety of athletes. The PSIS-Y-SF measured six dimensions consisting of: mental preparation, motivation, concentration, self-confidence, team emphasis, and anxiety control. Findings indicated that at different levels (i.e., male youth elite vs female youth non-elite), there were different psychological skills being prioritized by these groups of athletes. Psychological skills such as confidence and team emphasis were seen to be viewed as a higher priority in the elite groups in comparison to the non-elite groups (Milavic et al., 2019). Thus, the level, age, and intensity of an athlete can play a part into their psychological needs. Highlighting that each stage has specific psychological requirements.

A pillar of the LTD model is to develop foundational physical, technical, and tactical skills at a young age, then take the proper steps to improve these skills and introduce new skills as the athlete matures and progresses (Norris, 2010). Similarly, the same process should be provided for psychological skills, as they take time to learn and develop to a point where they can be implemented into training and competitive situations (Bell et al., 2020).

Athletes in different sport types may require different PST, therefore, the skills within their development model should account for any of these potential differences (Dohme et al., 2019). It was also recognized by Dohme et al. (2019) that future research should target the requirements of athletes in their respective sport, while also accounting for the developmental stage of the athlete. The systematic review done by Dohme et al., (2019) signified that many

researchers have taken the time to investigate the implications of PST in athletes. However, there lacks a solid foundation of how these skills are delivered, monitored, and tracked throughout an athlete's developmental progression (Dohme et al., 2019). This presents a gap in current literature to further investigate the prescribed skills NSO's identify as important with regard to an athlete's PST as they progress through the LTD model. Consistent follow up is needed to see how PST is progressing and developing for athletes. There may be limited variation of physical skills as athletes progress through stages of development (i.e., T2T - T2C), however, levels of psychological readiness could be impacted as future progress through these stages (i.e., T2T, T2C, and T2W). Research is needed to better understand the type of psychological skills prescribed for athletes in each of these stages and how these skills can be fostered over an athletes' competitive career.

## **Chapter Three: Methodology**

### **Research Question**

The present research aims to shed light the current standing of PST in our NSO LTD models, specifically in the final three stages of development. The research is structured to investigate the following questions:

- 1- What psychological skills are being prescribed by each individual NSO within the T2T, T2C, and T2W stages?
- 2- Compare and contrast how PST progresses across NSO's between the final three stages (i.e., T2T, T2C, and T2W) of the LTD model?
- 3- How does the categorization of sport (i.e., Individual, Team, Combative, and Artistic) impact the prescription of PST throughout the last stages (i.e., T2T, T2C, and T2W) of the LTD model?

### **Research Protocol**

Ethics approval was obtained from the CHREB and the University of Calgary (REB20-0786). NSO groups were selected from the CS4L website and their respective LTD models were taken to be used for content analysis. Each LTD model is presented as public information and provided on the CS4L website. The psychological skills listed from each NSOs LTD model provided the information for the content analysis.

### **Participants and Sample Size (47)**

A total of 47 LTD models were taken from the CS4L website. As all sports were under the CS4L umbrella, all followed the same LTD model template. For the purpose of this research, only able-bodied sports were chosen to be a part of the sample. There is a need for research in the area of PST in athletes with disabilities and the PST required for the population may differ

from able-bodied athletes. Although NSO's provided their LTD on the CS4L website, some also required going to the NSO's online website to further comprehend their LTD models.

## **Analysis**

As the research falls under a qualitative lens, the main analysis will be category extraction from a manifest summative content analysis. The manifest summative content analysis will showcase various psychological skills that are being prescribed at certain stages of the LTD model (i.e., T2T, T2C, and T2W). Additionally, the manifest portion of the analysis will look to identify psychological skills being prescribed across stages (e.g., goal setting being prescribed in both the T2T and T2C stages) through only analyzing the text provided (i.e., LTD model). The summative portion of the analysis tracks frequencies and for the purpose of this research, it will be tracking the regularity of psychological skills within the various LTD models. The primary goal of the manifest summative content analysis is to report which psychological skills are being prescribed in sports throughout the three stages of development. This research will provide initial insight into the foundation of psychological skills and the opportunity to refine/consolidate these skills.

Sports were then categorized based on the type of sport being reviewed, and the type of psychological skills that may be required for that sport category (i.e., Team, Individual, Combative, and Artistic). These categories were made to separate sports based on the psychological skills that NSOs emphasized will lead to podium performances. For example, artistic swimming is a team and artistic sport, therefore, the NSO's will identify similar PST models across these sports for athletes in each of the classified stages, and their focuses will be tailored to one category more than the other. With the classification of sports into groups (i.e.,

Team, Individual, Combative, and Artistic) the aim is to have an organized classification and examine any trends related to the psychological skills that are prescribed based on the sport type.

The manifest summative content analysis will follow an inductive analysis to develop larger categories based on the skills provided by each NSO's LTD. Based on the psychological skills provided by the various NSO's LTD models, larger order categories will be created with the purpose of being more visually appealing. It will also provide insight to the type of skills being prioritized throughout each of the stages and across sports. The process of the manifest summative content analysis will clearly demonstrate the various psychological skills being prescribed within the 47 LTD models, in the three stages of development (i.e., T2T, T2C, T2W) and the frequency throughout these models.

## Chapter Four: Results

Table 1 reflects the PST skills that are being recommended by NSO's for each level (i.e., T2T, T2C, and T2W) sport taken from the CS4L website. It also identifies at which stages the PST skills are being taught. From the 47 NSO sports analysed, 10 demonstrated a consistency in the delivery of psychological skills throughout the stages (i.e., they had the same skills being taught and progressed through each of the three stages). If psychological skills need to be learned, developed and progressed based on the differing requirements of each stage, this should be reflected in the frequency of PST in each NSO LTD's. Of note, six NSO's in the sports of *Baseball, Cycling, Lacrosse, Nordic Skiing, Sailing, Taekwondo* had only one skill listed (i.e., sport specific skills) for each stage.

**Table 1***Psychological skills in NSO's LTD models in three stages (i.e., T2T, T2C, and T2W)*

SPORT	PSYCHOLOGICAL SKILLS
Alpine Skiing	T2T <ul style="list-style-type: none"> <li>- Goal setting</li> <li>- Arousal States</li> <li>- Focus</li> <li>- Imagery</li> <li>- Self-Talk</li> <li>- Individualized Emotions</li> <li>- Performance</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Goal setting</li> <li>- Arousal States</li> <li>- Focus</li> <li>- Imagery</li> <li>- Self-Talk</li> <li>- Individualized Emotions</li> <li>- Performance</li> <li>- Routine Plans</li> <li>- Mindfulness</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Goal setting</li> <li>- Arousal States</li> <li>- Focus</li> <li>- Imagery</li> <li>- Self-Talk</li> <li>- Individualized Emotions</li> <li>- Performance</li> <li>- Routine Plans</li> <li>- Mindfulness</li> </ul>



Archery	T2T - Cognitive Development
	T2C - Competition Season
	T2W - Competition Season - Mental Training
Artistic Swimming	T2T - Routines - Goal Setting - Coping
	T2C - Goal Setting - Mental Preparation - Individual Factors
	T2W - Routines - Mental Preparation - Individual Factors
Athletics	T2T - Mental Development - Modelling
	T2C - Mental Development
	T2W - Mental Development
Badminton	T2T - Psychological Development - Goal Setting - Mental Preparation - Media Training
	T2C - Psychological Development - Goal Setting - Mental Preparation - Media Training
	T2W - Psychological Development - Goal Setting - Mental Preparation - Media Training - Focus Cues - Team Training

Baseball	T2T - Psychological Development
	T2C - Psychological Development
	T2W - Psychological Development
Basketball	T2T - Goal Setting - Mental Skills - Individualized Training Program - Team Dynamics - Coach Impact
	T2C - Goal Setting - Mental Skills - Individualized Training Program - Team Dynamics - Coach Impact
	T2W - Goal Setting - Mental Skills - Individualized Training Program - Team Dynamics - Coach Impact
Biathlon	T2T - Concentration & Focus Skills - Race Plans
	T2C - Concentration & Focus Skills - Race Plans
	T2W - Concentration & Focus Skills - Race Plans - Adaptation to Environment Changes

Boxing	T2T <ul style="list-style-type: none"> <li>- Psychological Skills Development</li> <li>- Individual Arousal</li> <li>- Competition Mindset</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Psychological Skills Development</li> <li>- Individual Arousal</li> <li>- Competition Mindset</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Psychological Skills Development</li> <li>- Individual Arousal</li> <li>- Competition Mindset</li> </ul>
Broomball	T2T <ul style="list-style-type: none"> <li>- Skill Refinement</li> <li>- Strategy for Tournament Play</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Skill Refinement</li> <li>- Execution of Skills in Tournament Play</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Skill Refinement</li> <li>- Execution of Skills in Tournament Play</li> </ul>
Canoe/Kayak	T2T <ul style="list-style-type: none"> <li>- Focus Skills</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- No Psychological Skills Recommended</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Mental Skills</li> <li>- Attention and Distraction Skills</li> </ul>
Curling	T2T <ul style="list-style-type: none"> <li>- Psychological Development</li> <li>- Mental Preparation</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Psychological Development</li> <li>- Mental Preparation</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Psychological Skill Mastery</li> </ul>

Cycling	T2T - In-Play Choices - Team Dynamics
	T2C - In-Play Choices - Team Dynamics
	T2W - In-Play Choices - Team Dynamics
Diving	T2T - No Psychological Skills Recommended
	T2C - No Psychological Skills Recommended
	T2W - No Psychological Skills Recommended
Equestrian	T2T - Psychological Skills Development
	T2C - Psychological Skills Development - Tactical Psychological Skills
	T2W - Psychological Skills Development
Fencing	T2T - Goal Setting - Adaptation - Mental Preparation
	T2C - Goal Setting - Mental Preparation - Emotional Maturity
	T2W - Goal Setting - Mental Preparation - Societal Expectation

Field Hockey	T2T <ul style="list-style-type: none"> <li>- Mental Capacities</li> <li>- Goal Setting</li> <li>- Self-Talk</li> <li>- Mental Skills</li> <li>- Coping</li> <li>- Competitive Attitude</li> <li>- Teamwork</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Mental Capacities</li> <li>- Goal Setting</li> <li>- Competitive Attitudes</li> <li>- Teamwork</li> <li>- Individualized Psychological Strategies</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Mental Capacities</li> <li>- Goal Setting</li> <li>- Competitive Attitudes</li> <li>- Teamwork</li> <li>- Individualized Psychological Strategies</li> </ul>
Figure Skating	T2T <ul style="list-style-type: none"> <li>- Fundamental Mental Skills</li> <li>- Ideal Performance State</li> <li>- Anxiety Management</li> <li>- Team Dynamics</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Fundamental Mental Skills</li> <li>- Ideal Performance State</li> <li>- Mental Tactics</li> <li>- Mental Strategies</li> <li>- Individualized Mental Training Plan</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Anxiety Management</li> <li>- Mental Tactics</li> <li>- Individualized Mental Training Plan</li> </ul>

Football	T2T <ul style="list-style-type: none"> <li>- Communication</li> <li>- Mental Tactics</li> <li>- Individualized Success and Planning</li> <li>- Mental Strategies</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Communication</li> <li>- Mental Tactics</li> <li>- Individualized Success and Planning</li> <li>- Mental Strategies</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Communication</li> <li>- Mental Tactics</li> <li>- Individualized Success and Planning</li> <li>- Mental Strategies</li> </ul>
Freestyle Skiing	T2T <ul style="list-style-type: none"> <li>- Competition Ready</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- IST Training</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- IST Training</li> </ul>
Golf	T2T <ul style="list-style-type: none"> <li>- Individual Psychological Preparation</li> <li>- Modelling</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Individual Psychological Preparation</li> <li>- Modelling</li> <li>- Goal Setting</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Individual Psychological Preparation</li> <li>- Goal Setting</li> </ul>

Gymnastics	T2T <ul style="list-style-type: none"> <li>- Self-Discipline</li> <li>- Stress Management</li> <li>- Environmental Demands</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Self-Discipline</li> <li>- Mental Preparation Skills</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Self-Discipline</li> <li>- Environmental Demands</li> <li>- Mental Preparation Skills</li> <li>- Individualized Mental Skills</li> </ul>
Ice Hockey	T2T <ul style="list-style-type: none"> <li>- Mental and Tactical Skills</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Competitive Environment Preparation</li> <li>- Individualized Psychological Skills</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Mental and Tactical Skills</li> <li>- Competitive Environment Preparation</li> </ul>
Judo	T2T <ul style="list-style-type: none"> <li>- Judo Specific Skills</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Judo Specific Skills</li> <li>- Ideal Performance State</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Judo Specific Skills</li> <li>- Ideal Performance State</li> </ul>
Lacrosse	T2T <ul style="list-style-type: none"> <li>- Mental Training</li> <li>- Goal Setting</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Mental Training</li> <li>- Goal Setting</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Mental Training</li> <li>- Goal Setting</li> </ul>

Nordic Skiing	T2T - Sport Specific Skills
	T2C - Sport Specific Skills
	T2W - Sport Specific Skills
Rowing	T2T - Goal Setting - Self-Assessment - Enjoyment - Routines - Regulations - Imagery - Relaxation - Reframing Thoughts - Conflict Management - Leadership - Additional Resources
	T2C - Goal Setting - Self-Assessment - Enjoyment - Routines - Regulations - Imagery - Relaxation - Reframing Thoughts - Conflict Management - Leadership - Additional Resources
	T2W - Goal Setting - Self-Assessment - Enjoyment - Routines - Regulations - Imagery - Relaxation - Reframing Thoughts - Conflict Management - Leadership - Additional Resources



Rugby	T2T - No Psychological Skills Recommended
	T2C - No Psychological Skills Recommended
	T2W - No Psychological Skills Recommended
Sailing	T2T - Mental Skills
	T2C - Mental Skills
	T2W - Mental Skills
Shooting	T2T - Visualization - Multi-Sport
	T2C - Independence - Modelling - Adaptability - Individual Mental Skills
	T2W - Adaptability - Individual Mental Skills

Snowboarding	<p>T2T</p> <ul style="list-style-type: none"> <li>- Mental Skills</li> <li>- Confidence</li> <li>- Imagery</li> <li>- Relaxation</li> <li>- Reflection</li> <li>- Coach Relationship</li> </ul>
	<p>T2C</p> <ul style="list-style-type: none"> <li>- Mental Skills</li> <li>- Confidence</li> <li>- Coach Relationship</li> </ul>
	<p>T2W</p> <ul style="list-style-type: none"> <li>- Mental Skills</li> <li>- Confidence</li> </ul>
Soccer	<p>T2T</p> <ul style="list-style-type: none"> <li>- Routines</li> <li>- Mental Preparation</li> <li>- Goal Setting</li> <li>- Coping</li> <li>- Independence</li> </ul>
	<p>T2C</p> <ul style="list-style-type: none"> <li>- Routines</li> <li>- Mental Preparation</li> <li>- Goal Setting</li> <li>- Coping</li> <li>- Independence</li> </ul>
	<p>T2W</p> <ul style="list-style-type: none"> <li>- Routines</li> <li>- Mental Preparation</li> <li>- Goal Setting</li> <li>- Coping</li> <li>- Independence</li> </ul>

Softball	<p>T2T</p> <ul style="list-style-type: none"> <li>- Mental Skills</li> <li>- Visualization</li> <li>- Decision Making</li> <li>- Goal Setting</li> <li>- Emotions</li> <li>- Stress Management</li> </ul>
	<p>T2C</p> <ul style="list-style-type: none"> <li>- Mental Skills</li> <li>- Visualization</li> <li>- Decision Making</li> <li>- Goal Setting</li> <li>- Emotions</li> <li>- Stress Management</li> <li>- Game Plans</li> </ul>
	<p>T2W</p> <ul style="list-style-type: none"> <li>- Mental Skills</li> <li>- Visualization</li> <li>- Decision Making</li> <li>- Goal Setting</li> <li>- Emotions</li> <li>- Stress Management</li> <li>- Game Plans</li> </ul>
Sport Climbing	<p>T2T</p> <ul style="list-style-type: none"> <li>- Mental Preparation</li> <li>- Independence</li> <li>- Focus</li> <li>- Goal Setting</li> <li>- Imagery</li> <li>- Relaxation</li> <li>- Routines</li> </ul>
	<p>T2C</p> <ul style="list-style-type: none"> <li>- Mental Preparation</li> <li>- Independence</li> <li>- External Factors</li> </ul>
	<p>T2W</p> <ul style="list-style-type: none"> <li>- Mental Preparation</li> <li>- Independence</li> <li>- Routines</li> </ul>

Sport Parachute	T2T <ul style="list-style-type: none"> <li>- Mental techniques</li> <li>- Teamwork</li> <li>- Individual Psychological Skills</li> <li>- Routines</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Mental techniques</li> <li>- Teamwork</li> <li>- Individual Psychological Skills</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Mental techniques</li> <li>- Teamwork</li> <li>- Individual Psychological Skills</li> <li>- Routines</li> </ul>
Squash	T2T <ul style="list-style-type: none"> <li>- Psychological Skills</li> <li>- Imagery</li> <li>- Routines</li> <li>- Goal Setting</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Psychological Skills</li> <li>- Imagery</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Psychological Skills</li> <li>- Imagery</li> <li>- Goal Setting</li> </ul>
Swimming	T2T <ul style="list-style-type: none"> <li>- Imagery</li> <li>- Relaxation and Focus</li> <li>- Individual Factors</li> <li>- Goal Setting</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Imagery</li> <li>- Relaxation and Focus</li> <li>- Individual Factors</li> <li>- Goal Setting</li> <li>- Routines</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Imagery</li> <li>- Relaxation and Focus</li> <li>- Individual Factors</li> <li>- Routines</li> </ul>

Table Tennis	T2T <ul style="list-style-type: none"> <li>- External Factors</li> <li>- Mental Skills</li> <li>- Decision Making</li> <li>- Game Plan</li> <li>- Coping Skills</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- External Factors</li> <li>- Mental Skills</li> <li>- Decision Making</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- External Factors</li> <li>- Mental Skills</li> </ul>
Taekwondo	T2T <ul style="list-style-type: none"> <li>- Mental Awareness</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Mental Awareness</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Mental Awareness</li> </ul>
Tennis	T2T <ul style="list-style-type: none"> <li>- Individual factors</li> <li>- Mental Skills</li> <li>- Ideal Performance State</li> <li>- Team Dynamics</li> <li>- Goal Setting</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Individual factors</li> <li>- Mental Skills</li> <li>- Ideal Performance State</li> <li>- Injury</li> <li>- Focus</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Individual factors</li> <li>- Mental Skills</li> <li>- Ideal Performance State</li> <li>- Team Dynamics</li> </ul>
Triathlon	T2T <ul style="list-style-type: none"> <li>- Individual Factors</li> <li>- Mental Skills</li> </ul>
	T2C <ul style="list-style-type: none"> <li>- Individual Factors</li> <li>- Mental Skills</li> </ul>
	T2W <ul style="list-style-type: none"> <li>- Individual Factors</li> </ul>

Ultimate	T2T - Enjoyment
	T2C - Performance
	T2W - International Success
Volleyball	T2T - Mental Preparation - Importance - Concentration - Stress Management - Coping
	T2C - Mental Preparation - Importance - Visualization - Time Management
	T2W - Mental Preparation - Visualization - Distraction - Relaxation
Water Polo	T2T - Mental Growth - Skill development
	T2C - Environmental Factors
	T2W - Teamwork
Waterski & Wakeboard	T2T - Individual Factors
	T2C - Performance Factors and Pressures
	T2W - Performance Factors and Pressures
Weightlifting	T2T - Stressful Situations - Concentration - Visualization - Muscles Relaxation
	T2C - Stressful Situations
	T2W - Stressful Situations - Personal Factors

Wrestling	T2T - Personal Factors
	T2C - Performance
	T2W - Adapt to Environment

The inductive analysis resulted in the creation of twelve upper level categories based on the skills prescribed by the NSO's. The categories created were: 1) *Individual Psychological Preparation*, 2) *Psychological Skills Development*, 3) *Competition Plans and Routines*, 4) *External Factors*, 5) *Arousal, Anxiety and Stress Management*, 6) *Communication*, 7) *Sport Enjoyment*, 8) *Self-Talk*, 9) *Goal Setting*, 10) *Imagery/Visualization*, 11) *Teamwork Components*, 12) *Focus/Refocus*.

**Table 2***Definition of categories from content analysis.*

CATEGORIES	DEFINITION
Individual Psychological Preparation	The psychological skills used to create an optimal performance state for the athlete to perform at a high standard. These skills are unique and specific to the athlete.
Psychological Skills Development	The process of learning, teaching and developing psychological skills for the athletes. It includes the steps that are made to help grow these psychological skills.
Competition Plans & Routines	The methodological process an athlete goes through prior to engaging in their sport or competition in order to feel mentally prepared and in the correct mindset in order to compete.
External Factors	Elements outside of the individual's specific psychological setting. Factors can consist of environmental, peripheral stimuli, non-sport related components that require psychological strategy to maintain focus for performance.
Arousal, Anxiety, and Stress Management	An individual's ability to regulate and control their emotions to aid in their sport performance.
Communication	The relationship between athletes and individuals to understand and converse about the needs of the athlete.
Sport Enjoyment	The amount in which an individual appreciates their sport and consists of activities to enhance this enjoyment.
Self-Talk	Process of internal or external dialogue either before, during or after an athletic event. Can be used in training and competition
Goal Setting	The development of achievements for athletes to work towards throughout an athletic season and career.
Imagery/Visualization	The practice of replicating athletic situations through mental images in order to prepare for the athletic situation athletes will be a part of.
Teamwork Components	The team elements that play into the success and efficacy of a team sport and the skills that can help nurture a productive team environment.
Focus/Refocus	Cues to bring athlete back to the desired task at hand to put all efforts into succeeding in the athletic demand.



Skills were examined and placed into categories which best suited their desired focus and outcome which is shown in Table 3.

**Table 3**

*Represents the classification of psychological skills into the higher order categories.*

<b>Individual Psychological Preparation</b>	<ul style="list-style-type: none"> <li>• Individual Components</li> <li>• Self-Assessment</li> <li>• Self-Discipline</li> <li>• Independence</li> </ul>
<b>Psychological Skills Development</b>	<ul style="list-style-type: none"> <li>• Mental/Psychological Skills</li> <li>• Cognitive/Psychological Development</li> <li>• Mental Techniques/Training/Tactics</li> <li>• Mental Growth/Capacities</li> <li>• Concentration</li> </ul>
<b>Competition Plans/Routines</b>	<ul style="list-style-type: none"> <li>• Routines</li> <li>• Mental Preparations</li> <li>• Race/Game Plan</li> <li>• Reframing</li> <li>• Performance</li> <li>• Competition Mindset/Cues</li> </ul>
<b>External Factors</b>	<ul style="list-style-type: none"> <li>• External Factors</li> <li>• Environmental Demands</li> <li>• Situational Demands</li> <li>• Media Training</li> <li>• Coach Impact</li> </ul>
<b>Arousal, Anxiety &amp; Stress Management</b>	<ul style="list-style-type: none"> <li>• Arousal</li> <li>• Emotions</li> <li>• Adaptations</li> <li>• Coping</li> <li>• Anxiety/Stress Management</li> <li>• Decision Making</li> <li>• Relaxation</li> </ul>
<b>Communication</b>	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Modelling</li> <li>• Reflection</li> </ul>
<b>Sport Enjoyment</b>	<ul style="list-style-type: none"> <li>• Sport Specific</li> <li>• Enjoyment</li> <li>• Multi-Sport</li> <li>• Personal Factors</li> </ul>
<b>Self-Talk</b>	<ul style="list-style-type: none"> <li>• Self-talk</li> <li>• Internal dialogue</li> </ul>

<b>Goal Setting</b>	<ul style="list-style-type: none"> <li>• Goal setting</li> <li>• Yearly Training Plans</li> <li>• Career Expectations</li> </ul>
<b>Imagery/Visualization</b>	<ul style="list-style-type: none"> <li>• Imagery/visualization</li> <li>• Mental Images</li> </ul>
<b>Teamwork Components</b>	<ul style="list-style-type: none"> <li>• Team environment</li> <li>• Team building</li> <li>• Group work</li> </ul>
<b>Focus/Refocus</b>	<ul style="list-style-type: none"> <li>• Focus/Refocus skills</li> </ul>

A qualitative analysis was used to examine if skills that were identified and introduced in a stage (i.e., T2T, T2C, T2W) are further identified and developed as athletes progress through later stages (i.e., from T2T through T2W stages). It also identifies the types of skills that are being taught across sports. This analysis provides an overview PST at the T2T, T2C, and T2W levels across NSO's.

**Table 4***Train to Train (T2T)*

TRAIN TO TRAIN (T2T) SKILLS	PERCENTAGE
Psychological Skills and Development	23/47 (49%)
Competition Plans/Routines	17/47 (36%)
Goal Setting	15/47 (32%)
Individual Psychological Preparation	14/47 (30%)
Arousal, Anxiety & Stress Management	11/47 (23%)
External Factors	8/47(17%)
Teamwork Components	6/47 (13%)
Imagery/Visualization	5/47 (11%)
Communication	4/47 (9%)
Sport Enjoyment	4/47 (9%)
Focus/Refocus Cues	3/47 (6%)
Self-Talk	2/47 (4%)

*Note.* Identified PST in the T2T Stage across NSOs' (N=47)

In the T2T stage, *Psychological Skills and Development* (23/47; 49%) showed the highest percentage of prescription across NSO's. The skill *Self-Talk* (2/47; 4%) showed the lowest percentage of prescription across all NSO's. Data represents the number of sports (i.e., 47) that prescribe the higher order categories (i.e., 12) prescribed in T2T stage.

**Table 5***Train to Compete (T2C)*

TRAIN TO COMPETE (T2C) SKILLS	PERCENTAGE
Psychological Skills and Development	19/47 (40%)
Competition Plans/Routines	16/47 (34%)
Individual Psychological Preparation	14/47 (30%)
Goal Setting	13/47 (28%)
Imagery/Visualization	6/47 (13%)
Arousal, Anxiety & Stress Management	5/47 (11%)
External Factors	5/47 (11%)
Focus/Refocus Cues	4/47 (9%)
Sport Enjoyment	4/47 (9%)
Teamwork Components	3/47 (6%)
Communication	2/47 (4%)
Self-Talk	1/47 (2%)

*Note.* Identified PST in the T2C Stage across NSOs' (N=47)

Based on the percentages, the category *Psychological Skills and Development* (19/47; 40%) we identified with the highest frequency in the T2C stage across NSO's. The skill reported by NSO's with the lowest frequency was *Self-Talk* (1/47; 2%). *Self-Talk* was also the lowest reported skill in the T2T stage. Data represents the number of sports (i.e., 47) that prescribe the higher order categories (i.e., 12) prescribed in T2C stage.

**Table 6***Train to Win (T2W)*

TRAIN TO WIN (T2W) SKILLS	PERCENTAGE
Psychological Skills and Development	21/47 (45%)
Competition Plans/Routines	21/47 (45%)
Goal Setting	13/47 (28%)
Individual Psychological Preparation	13/47 (28%)
External Factors	8/47(17%)
Focus/Refocus Cues	7/47 (15%)
Arousal, Anxiety & Stress Management	6/47 (13%)
Teamwork Components	6/47 (13%)
Imagery/Visualization	5/47 (11%)
Sport Enjoyment	5/47 (11%)
Communication	1/47 (2%)
Self-Talk	1/47 (2%)

*Note.* Identified PST in the T2W Stage across NSOs' (N=47)

In the T2W stage, *Psychological Skills and Development* and *Competition Plans/Routines* (21/47; 45%) were reported most frequently. Similarly, to the previous two stages (i.e., T2T and T2C), *Self-Talk* (1/47; 2%) was the least frequent psychological skill prescribed in this stage. Data represents the number of sports (i.e., 47) that prescribe the higher order categories (i.e., 12) prescribed in T2W stage.

Tables 4, 5, and 6 identify the percentage of PST skills reported from NSO's across stages (i.e., T2T, T2C, and T2W). Of the 12 PST skills examined the only skill prescribed that increased across all three stages was *Focus/Refocus Cues* (T2T: 3/47; 6% - T2C: 4/47; 9% - T2W: 7/47; 15%). Skills such as *Imagery/Visualization; Psychological Skills and Development; Performance and Competition; Teamwork Components; External Factors; Arousal, Anxiety and Stress Management; and Communication* fluctuated throughout the T2T, T2C, and T2W stages, indicating a shift of recommendation by NSO's.

The following four tables (i.e. Table 7, 8, 9, 10, and 11) identify the PST recommended by NSO's in the four categorized sport groups (i.e., Individual, Team, Combative, Artistic). The content analysis consisted of 47 NSO LTD models taken from the CS4L website. Each NSO sport was categorized into one of four groups: Team, Individual, Combative or Artistic Sports. The categorization of these sports is shown in Table 7.

**Table 7***NSO categorization into Individual, Team, Combative, or Artistic Sports*

<b>Individual</b>	<b>Team</b>	<b>Combative</b>	<b>Artistic</b>
Alpine Skiing	Baseball	Boxing	Artistic Swimming
Archery	Basketball	Judo	Figure Skating
Athletics	Broomball	Taekwondo	Gymnastics
Badminton	Canoe/Kayak	Wrestling	
Biathlon	Curling		
Cycling	Field Hockey		
Diving	Football		
Equestrian	Ice Hockey		
Fencing	Lacrosse		
Freestyle Skiing	Rowing		
Golf	Rugby		
Nordic Skiing	Soccer		
Sailing	Softball		
Shooting	Sport Parachute		
Snowboarding	Volleyball		
Sport Climbing	Ultimate		
Squash	Water Polo		
Swimming			
Table Tennis			
Tennis			
Triathlon			
Wakeboard/Waterski			
Weightlifting			

*Note.* Selected LTD models, provided from Canadian Sport 4 Life Website.

**Table 8***Individual Sport*

<b>Skill</b>	<b>Percentage</b>
Individualized Psychological Preparation	12/23 (52%)
Psychological Skills and Development	11/23 (48%)
Competition Plans/Routines	10/23 (43%)
Arousal, Anxiety & Stress Management	8/23 (35%)
Goal Setting	8/23 (35%)
Imagery/Visualization	7/23 (30%)
External Factors	6/23 (26%)
Focus/Refocus	4/23 (17%)
Teamwork Components	3/23 (13%)
Communication	2/23 (9%)
Sport Enjoyment	2/23 (9%)
Self-Talk	1/23 (4%)

*Note.* PST Identified in Individual Sport NSO's (N=23)

In individual sports, *Individualized Psychological Preparation* (12/23; 52%) was the most prescribed PST identified across the various sports. *Self-Talk* (1/23; 4%) was the least prescribed PST across individual sports. Data represents the number of categories (i.e., 12) prescribed in Individual sport types (i.e., 23).



**Table 9***Team Sport*

<b>Skill</b>	<b>Percentage</b>
Psychological Skills and Development	12/14 (86%)
Individual Psychological Preparation	8/14 (57%)
Competition Plans/Routines	6/14 (43%)
Arousal, Anxiety & Stress Management	5/14 (36%)
Goal Setting	5/14 (29%)
Imagery/Visualization	3/14 (21%)
Teamwork Components	3/14 (21%)
External Factors	2/14 (14%)
Focus/Refocus Cues	2/14 (14%)
Communication	1/14 (7%)
Sport Enjoyment	1/14 (7%)
Self-Talk	0/14 (0%)

*Note.* PST identified in Team Sport NSO's (N=14)

NSO's identified *Psychological Skills and Development* (12/14; 86%) was the highest prescribed PST. *Self-Talk* (0/14; 0%) was the least prescribed PST in team sports. Data represents the number of categories (i.e., 12) prescribed in Team sport types (i.e., 14).

**Table 10***Combative Sport*

<b>Skill</b>	<b>Percentage</b>
Individual Psychological Preparation	4/4 (100%)
Competition Plans/Routines	2/4 (50%)
External Factors	1/4 (25%)
Psychological Skills Development	1/4 (25%)
Sport Enjoyment	1/4 (25%)
Arousal, Anxiety & Stress Management	0/4 (0%)
Communication	0/4 (0%)
Goal Setting	0/4 (0%)
Individual Psychological Preparation	0/4 (0%)
Teamwork Components	0/4 (0%)
Imagery/Visualization	0/4 (0%)
Focus/Refocus Cues	0/4 (0%)
Self-Talk	0/4 (0%)

*Note.* PST identified in Combative Sport NSO's (N=4)

The PST with the highest report frequency was *Individual Psychological Preparation* (4/4; 100%). The PST, *External Factors*, *Psychological Skills Development*, *Sport Enjoyment* (1/4; 25%) were the least frequent by PST in the combative sport NSO's. A number of psychological skills were not recorded in the combative sport NSO's LTD models. Data represents the number of categories (i.e., 12) prescribed in Individual sport types (i.e., 4).

**Table 11***Artistic Sport*

<b>Skill</b>	<b>Percentage</b>
Arousal, Anxiety & Stress Management	3/3 (100%)
Individualized Psychological Preparation	3/3 (100%)
Competition Plans/Routine	2/3 (67%)
External Factors	1/3 (33%)
Goal Setting	1/3 (33%)
Psychological Skills and Development	1/3 (33%)
Teamwork Components	1/3 (33%)
Imagery/Visualization	0/3 (0%)
Focus/Refocus Cues	0/3 (0%)
Self-Talk	0/3 (0%)
Communication	0/3 (0%)
Sport Enjoyment	0/3 (0%)

*Note.* PST identified in Artistic Sport (N=3)

The PST's with the highest frequency were *Arousal, Anxiety and Stress Management* and *Individualized Psychological Preparation* (3/3; 100%). *External Factors, Goal Setting, Psychological Skills and Development* and *Teamwork Components* (2/3; 66%) were the least frequent by NSO's in Artistic sports alongside *Imagery/Visualization, Focus/Refocus, Self-Talk, Communication* and *Sport Enjoyment* (0/3; 0%).

*Communication*, and *Sport Enjoyment* were not reported (0/3; 0%). Data represents the number of categories (i.e., 12) prescribed in Individual sport types (i.e., 4).

These results provide insight into the skills being prescribed in the various sport types. *Psychological Skills Development* was consistently seen in each group, with majorities seen in *Team*, *Combative*, and *Artistic* sports. *Individual Preparation and Plans/Routines* was also a skill seen in all categories. Table 11 showcases the skills being prescribed in each sport. They indicate what skills are being taught and in which stage to demonstrate progression and potential consistent progression of developing and refining psychological skills.

## **Chapter Five: Discussion**

The present study set out to better understand the current status of PST within and across NSO LTD models in Canada. The value of PST has been acknowledged by many sport organizations as a key component to the progression of skills into the mastery level of sport, while also aiding performance at an international level (Birrer & Morgan, 2010). PST is often used in a planned, systematic, controlled and goal oriented manner in order to reap the most benefit from the desired psychological skills (Birrer & Morgan, 2010). Talent development consists of complex and challenging phases which can prepare individuals to perform at the highest levels of competition (Blijlevens et al., 2018). The use of PST can be a resource to aid in talent development and elite performance (Blijlevens et al., 2018). Throughout the final chapter of this thesis, findings alongside strengths and limitations of the research as well as future directions will also be discussed.

### **Train to Train (T2T)**

The fundamental components of the T2T stage indicate the beginning of high-performance activity while tailoring training towards sport specific skills (i.e., physical, technical, tactical, mental and emotional) ( Balyi, 2004; Higgs et al., 2019). The T2T stage is an introduction to elite training and performance where individuals begin to partake in structured training (Blijlevens et al., 2018). Within this stage, there is a focus on developing psychological skills to equip the individuals for the demands of high-performance sport. Skills referring to work ethic, discipline and interpersonal relationships to aid in the overall progression of athletes performance are prioritized at this stage (Blijlevens et al., 2018; Pankow et al., 2020). As the T2T is a critical stage in deciding which path athletes will follow (i.e., continue into the podium pathway or move to into a recreational pathway) the psychological skills being taught should

prepare athletes for the requirements needed based on their pathway choice (Higgs et al., 2019; Norris, 2010).

### ***Psychological Skills and Development***

In the T2T stage the content analysis revealed that the category “*Psychological Skills and Development*” was the most reported of all psychological skills in this stage (50%) (i.e., skills consisting of the learning, regulation and application of psychological skills are foundational in this category). “*Psychological Skills and Development*” are skills that train the psychological fitness of athletes which can help increase performance standards for these individuals (i.e., Mental/Psychological Skills) (Banack et al., 2012; Dohme et al., 2020). As this stage is a pivotal moment in the decision-making process of young athletes, providing them with sufficient tools to cope with the demands of high-performance sport is important (Dohme et al., 2020).

Across the NSO’s examined in this study, only 50% of sports identified “*Psychological Skills and Development*” in the content of their LTD in the T2T stage, and a number of sports (e.g., Archery, Canoe/Kayak, Field Hockey, Figure Skating, and Water Polo) prescribed skills under the category “*Psychological Skills and Development*” solely in the T2T stage.

Psychological development is a skill which aids the growth and progression of athletes as they transition into higher levels of sports (Boes et al., 2014). Sports such as Diving and Rugby indicate no PST is conducted as it was not explicitly stated in their LTD model. There were, however, a number of sports that did report *Psychological Skills and Development* skills at two or all three of the stages (i.e., 16 of the 22 sports who prescribed skills in this category).

It has also been acknowledged by youth athletes that the incorporation of PST during youth training, and continuing on into adolescence helps manage the challenges that arise during the transitions in sport (Bell et al., 2020). During a competitive season, the sample of athletic,

swimming and triathlete youth athletes noted that the incorporation of PST was a useful tool to aid in performance and would like to have consistent training of PST (Bell et al., 2020).

Introducing PST to youth athletes can aid with current and future sport enjoyment, as well as being a tool to learn and increase usage of mental skills (Visek et al., 2009). The addition of PST in training athletes within the T2T stage has aided in the athletes confidence and coping abilities (Sheard & Golby, 2006).

### ***Competition Plans/Routines***

The category of “*Competition Plans/Routines*” refers to individual psychological skills which are targeted to developing a schedule to allow the individual to feel mentally prepared prior to training/competition. In the T2T stage, the category “*Competition Plans/Routines*” was reported in 36% of the LTD’s. The creation of a pre-performance plan allows athletes to regulate individual factors prior to competing (Gould & Maynard, 2009). In a 15 month intervention, psychological skills were taught to a group of elite youth tennis players to aid in concentration, the addition of individual routines and pre-performance plans was shown to increase the focus, while also enhancing the sense of control the individuals have prior to serving/receiving a serve (Dohme et al., 2020). The development of individualized routines and the 15-month trial period provided athletes with sufficient time to learn and then implement the psychological skill (Boucher, 2012; Dohme et al., 2020). The integration of individualized athletic plans/routines is useful to athletes in the T2T stage as it provides a path for them to follow throughout their performance. This plan/routine can benefit the athlete by enhancing focus and directing attention to the important and relevant cues to their performance. This supports that adequate education and sufficient trial time is beneficial when introducing competition plans/routines to athletes in the T2T stage (Boucher, 2012; Dohme et al., 2020).

### ***Goal Setting***

“*Goal Setting*” was the third highest reported category (i.e., 33%) in the T2T stage across NSO’s. As athletes in the T2T stage are beginning to understand to the potential pathways they can pursue in their sport, having goals that align with these performance choices is critical. It is common that youth athletes express the importance of goal setting in their progression throughout their sport (Bell et al., 2020; Dohme et al., 2017). When asking a group of youth athletes to rank psychological skills (i.e., Goal Setting, Visualization and Focus), goal setting was positioned at the top, suggesting that youth athletes are aware of its importance, even if it is not being utilized (Dohme et al., 2017). An analysis of PST as reported by youth elite athletes Harwood et al. (2004), reported that goal setting was the psychological skill most utilized in both training and competition settings. Harwood et al., (2004), suggested that this could relate to improved task execution (i.e., performance of skills) which in turn, could translate to an increased sense of achievement during training. This study was conducted over a two-year span to provide adequate time for the education of goal setting and time to implement the skill of goal setting in both training and competition environments. Incorporating goal setting throughout the duration of the T2T stage allows athletes the opportunity to plan, learn, get feedback and the new information in both practice and competition settings. Goal Setting is a necessary skill to the T2T stage as athletes are beginning to uncover their athletic potential and dreams, which can help in the development of both short and long-term skills (i.e., across all area: physical, technical, tactical, mental, and emotional) moving into the T2C/T2W stages.

### ***Individual Psychological Preparation***

30% of NSO’s had skills listed under the category that were “*Individual Psychological Preparation*” in their LTD. As the T2T stage identifies psychological skills that could aid in



performance, individual psychological preparation that occurs prior to performance often differs between athletes (Gould & Maynard, 2009). Psychological preparation incorporates techniques to overcome any barriers, challenges, and obstacles the athlete may be facing and prepare the athlete to optimize their performance readiness (Militiadis et al., 2011). The need and usage for Individualized Psychological Preparation is acknowledged by both coaches and athletes (Birrer & Morgan, 2010; Militiadis et al., 2011). Throughout all stages of development in the podium pathway from junior elite athletes to Olympians (i.e., T2T, T2C, and T2W) it is imperative to improve focus and optimize arousal levels prior to competing (Gould & Maynard, 2009). Developing these individualized skills as an athlete in the T2T stage would provide time for development, evaluation, and refinement when transitioning into further stages. PST is utilized by individuals to accomplish tasks to see immediate results, as well as improvements over time (Dohme et al., 2019). The individual differences impact the usage of PST as the efficacy of the skills are dependent on the needs of the athlete (Dohme et al., 2019).

### ***Arousal, Anxiety, and Stress Management***

The skills under the category of “*Arousal, Anxiety, and Stress Management*” was reported 24% across NSO’s. This category encompasses an athlete’s arousal regulation throughout training and competition. The purpose in developing psychological techniques and routines prior to (i.e., pre-competition), during (i.e., competition) , and post-performance (i.e., competition debrief) is to better understand ones’ individual arousal, anxiety, coping mechanisms and the impact (i.e., either facilitative or debilitating) it may have on one’s performance (Birrer & Morgan, 2010). It has been suggested that arousal regulation is a key element to aiding in performance (Mamassis & Doganis, 2004). In a year-long MTP intervention, junior tennis athletes utilized PST to develop techniques to regulate arousal

throughout a season (Mamassis & Doganis, 2004) Targeting skills to monitor arousal, anxiety and stress symptoms during competition showed an increase in the self-confidence of these athletes, additionally on improvement in performance throughout the season was demonstrated (Mamassis & Doganis, 2004). As arousal levels differ between sports and individuals, it is important to introduce arousal regulation at a young age to allow the individual sufficient time to improve and establish their desired arousal levels (Birrer & Morgan, 2010; Mamassis & Doganis, 2004). As previously stated, the T2T stage is when athletes are starting to be exposed to high performance sport and incorporating psychological skills such as arousal regulation can help in the psychological preparation of these athletes in order to optimize training and competitive performance.

### ***External Factors; Teamwork Components***

Skills under the following categories of “*External Factors*” (17%); “*Teamwork Components*” (13%) were similar in their response rate in the T2T stage. For “*External Factors & Teamwork Components*”, they involve certain aspects of sport which may not always play a part in the psychological routine of individuals. For example, an athlete who competes as an individual (e.g., rhythmic gymnastics), does not have to deal with the elements of “*Teamwork Components*”. A qualitative research study was done to analyze the effects of both internal and external factors on both Italian and Slovenian winter sport athletes who are pursuing both athletic and professional careers (Kerstajn et al., 2018). The relationship between the athletic demands and the external variables (i.e., academic, psychosocial, financial, and environment) played a role in the training ability of these athletes (Kerstajn et al., 2018). Responses from 123 athletes concluded that additional resources should be available to support these athletes to account for the external factors that affect athletes’ training and competition (Kerstajn et al., 2018). With the

ratio of training to competition favoring time spent in training (i.e. 60%-40%), it provides athletes with increased time to practice their psychological skills in order to feel prepared for competition settings (Higgs et al., 2019). Therefore, there is a need for psychological training to account for external factors, which can be taught and practiced during training in the T2T stage. Conversely, in youth athletes, the external evaluation placed by peers onto individual performance plays a large role in the self-confidence of these athlete (Visek et al., 2013). In a study comparing the difference of psychological skills between individual and team sports, researchers acknowledged the challenges surrounding team dynamics, group thinking and gearing individual performance towards the teams goals (Kajbafnezhad et al., 2011). As identified by Pankow et al. (2020), the relationships between teammates become a factor into the psychological development of individuals and the overall team throughout the junior/youth stages. For athletes in the T2T stage, understanding the working relationship between teammates and peers can be a foundational psychological skill into the progression and success of these athletes (Kajbafnezhad et al., 2011).

### ***Imagery/Visualization***

Interestingly, category of “*Imagery/Visualization*” was reported at 11% even though the psychological skill of “*Imagery/Visualization*” has shown to be a vital component in the success of many athletes competing in high-performance environments (Cumming & Hall, 2002). An analysis on the impact of implementing a PST program to a group psychological indicators was conducted via weekly 30 min training sessions (Fournier et al., 2005). Results showed that imagery showed improvement as performance increased throughout the competitive season. Additionally, an intervention of imagery in junior soccer players indicated a positive relationship between imagery and athletes (Veraksa & Gorovaya, 2012). It provided the athletes with the

opportunity to utilize their imagination which triggered motivation and created a positive atmosphere and aided in performance (Veraksa & Gorovaya, 2012). An extended and consistent training program in reference to psychological skills was shown to aid in the understanding and thus, performance of the athletes.

### ***Communication; Sport Enjoyment***

The categories “*Communication*” and “*Sport Enjoyment*” were reported at 9% in the T2T stage. The category of “*Communication*” can be related to interpersonal and intrapersonal communication which consists of internal dialogue, and external conversation (Van Raalte et al., 2016) . This skill establishes boundaries and a further understanding between groups of individuals (i.e., coach and athlete). Developing strong communication skills in the coach-athlete relationship has shown to be an important element in athletic success (Höök et al., 2021). It was also acknowledged by these researchers that coaches who ensured their athletes had good communication with them and their integrative sports team showed the most success as it increased the sense of trust within the group (Höök et al., 2021). The T2T stage is a pivotal stage in which many athletes either continue through sport, or they drop out (Higgs et al., 2019). Therefore, collaborative work and sufficient communication lines between athletes, coaches, organizations and stakeholders is crucial to maintain athletes pursuits towards further development (Higgs et al., 2019).

The category “*Sport Enjoyment*” is often correlated to the competitive aspects of the sport, meaning that working hard and winning should be enjoyable for the individuals (Holland et al., 2010). As seen in youth elite rugby players, “*Sport Enjoyment*” was seen to be an upper level category associated with the mental qualities seen in these successful athletes (Holland et al., 2010). In a retrospective and prospective research study, athletic perspectives on sport

enjoyment were analyzed, which consistently increased sport enjoyment with perceived physical competence (Zanatta et al., 2018). Linking both sport enjoyment and physical competence with talent development correlated to continued participation in sport (Zanatta et al., 2018). As athletes are beginning to increase the intensity of their sport/competition in the T2T stage, it is important to maintain the enjoyment of the sport to ensure positive attitudes and maintenance in the sport environment (Zanatta et al., 2018). As the T2T stage is a definitive stage for most athletes (i.e., continue in sport or drop-out), integrating aspects to increase Sport Enjoyment should be added in order to keep athletes in sport and motivated to transition into future levels of sport (i.e., T2C/T2W).

### ***Focus; Self-Talk***

Finally, the categories of “*Focus*” and “*Self-Talk*” were prescribed less than 10% in the various LTD models in the T2T stage (i.e., 7% and 4% respectively). The category of “*Self-Talk*” has been shown to be used by individuals who are in the process of learning new skills, by focusing on the technical skills associated with improving performance (Tod et al., 2011). Often, self-talk is utilized in conjunction with other psychological skills and is often rooted in motivation (Fournier et al., 2005). This often leads athletes and researchers to see elevated levels of self-talk before explicitly implementing it into training programs (Fournier et al., 2005). It was seen by Thibodeaux et al. (2020) that the development of a systematic model of self-talk should be created for youth athletes to follow in both training and competition settings. Often youth athletes vary from their training self-talk which is why consistent, methodical practice of self-talk phrases or cues would aid in the consistency of this psychological skill (Thibodeaux & Winsler, 2020). In a study done by Boucher (2012), junior elite hockey players self-talk routines were examined. The application of both motivational and instructional cues throughout a game

showed to aid in decision making and performance production (Boucher, 2012). The question of how is self-talk being taught to athletes in this stage and is it being monitored and evaluated in the most effective way is needed to ensure that it is facilitating athlete training and competitive performances. Understanding the type of self-talk (i.e., motivational, technical, negative, or positive) being done by athletes is important to ensure that it is helping and facilitating the development of the athletes.

Focus is also a skill that can align itself with other psychological skill (e.g., routines/pre-performance plans), however, there is evidence that developing and improving focus skills can positively impact the learning of specific skill (Fournier et al., 2005). A content analysis examining various psychological skills, including focus, which taught researchers the importance of understanding the individual needs of athletes and how to tailor focus drill to the desired needs of both the athlete and the sport (Holland et al., 2010). Having a better understanding of attentional focus and how to introduce and teach it can aid in the progression and monitoring of this psychological skill (Holland et al., 2010). In a systematic review, both process-focused and outcome-focused skills were researched and deemed important in Talent Identification and Development in youth athletes (Koopmann et al., 2020). As these athletes are in an important developmental stage, acquiring skills that can enhance focus would have positive impacts on one's' development (Koopmann et al., 2020). Given that the T2T stage is a transitional stage into high-performance, it is interesting to see that both "*Focus*" and "*Self-Talk*" were identified as the least prescribed categories, as they could aid in the adjustment to the increased training and performance standard.

The findings of the content analysis align with the foci of the T2T stage; which focus on developing and implementing psychological skills in training and competition settings.

Interestingly, in a study done by Bell et al., (2020) a group of youth athletes states that the most important psychological skills were Goal-Setting, Visualization, Positive Self-Talk and pre-performance routines. However, these psychological skills fluctuated in regards to the recommended prescription of psychological skills in this stage (Goal Setting:31%, Visualization:10%, Self-Talk:4%, Pre-performance Routines:21%). In the T2T stage, athletes are often learning how to implement skills that are tailored to their desired sport. Vissek et al. (2013) acknowledge that athletic skills at this stage should begin to train sport specific skills to allow athletes to develop the bodily awareness and ability to perform in their desired sport. It also provided athletes with an appropriate amount of time to learn and progress in their skills before they continued on at a higher-performance level. Therefore, all skills (i.e., physical, technical, tactical, mental, and emotional) in the T2T stage should begin to develop a foundation of PST in order to guide athletes on the correct path towards success. A focus on psychological development is critical if one of the major outcomes of LTD models is to put athletes on podiums (i.e., T2W stage).

### **Train to Compete**

In the T2C stage the focus is the refinement of physical, technical, tactical, mental, and emotional skills with the emphasis on allowing specialization in a sport specific training environment (Higgs et al., 2019). Pankow et al. (2020), found that during the T2C stage the PST begins to focus on performance-oriented skills. This is done so the psychological skills that have been introduced and learned in T2T stage can now be transitioned into competition environment. There is an increase of competition in comparison to the T2T stage (i.e., 40% -60%). As the pressures of sport begin to rise, it is important to equip athletes with the proper skills to effectively manage the pressure of high performance competitions (Pankow et al., 2020).

### ***Psychological Skills and Development***

The most reported category by NSO's was "*Psychological Skills & Development*" (41%) which reflects efforts to focus on the continued learning and development of psychological skills as athlete's progress from the training environment into competition. The transition into the T2C stage is the onset of the performance pathway which increases the intensity of training and athletic expectation (i.e., performance outcomes) (Higgs et al., 2019). Therefore, the development and consolidation of psychological skills in both the daily training environment and competition is imperative at this stage to properly prepare for optimized performance. There is a noted decrease in the reported focus on psychological skill and development from the T2T stage (i.e., from 50% in the T2T stage to 41% in the T2C stage). One possible reason for this could be the increased time spent in competition at the T2C stage (i.e., moving from 40% - 60%), resulting in decreased practice time. Even though these athletes spend more time in a competition setting, the amount of time spent working on psychological skills across training and competitions should stay relatively consistent. As the athletes transition through the stages, the continuous learning of skills (e.g., Self-confidence, arousal regulation, psychological preparation etc.) must continue to occur in order to properly develop and consolidate skills (Higgs et al., 2019). The development and implementation of psychological skills should be valued across all podium pathway stages (i.e., T2T, T2C, T2W) to holistically develop the athlete (e.g., physical, technical, tactical, mental, and emotional) in order to enhance and optimize performance.

Sharp et al., (2013) introduced adolescent (16 & under) rugby athletes to a seven-month intervention of psychological skills through lectures, discussions and practical tasks alongside their physical training and rugby training. The consistency and duration of the intervention



allowed the participants to develop a better understanding of PST and how to properly utilize it to their advantage (Sharp et al., 2013). This study found that the psychological skills aided in the preparation and coping mechanisms prior to and during competition, which is a primary focus in terms of outcomes in the T2C stage (Sharp et al., 2013). Due to the increase of competition in the T2T stage (i.e., from 40% in the T2T stage to 60% in the T2C stage), equipping athletes with sufficient resources to cope with the demands of increased competitions and performance expectations would prove beneficial for this pool of athletes. Developing and nurturing psychological skills would provide support during the increased competition times and increased intensity of the training being conducted at the T2C stage. Additionally, it was found that not only was the implementation of PST could be useful for increased performance in their respective sport for this sample of Junior Rugby players, it generalized to other areas in life as well (e.g., school) (Sharp et al., 2013).

### ***Competition Plans/Routines***

As the competition component increases in the T2C stage (i.e., from 40-60%), the category *Competition Plans/Routines* (34%) should be recognized as being highly important in order to allow athletes the opportunity to develop and practice their psychological competition plans/routines. Pre-competition routines can be beneficial in focusing the individual on task-relevant information which can aid in confidence with the task (Dohme et al., 2019), while the development of competition plans/routines provides a strong base for building and maintaining a PST program within a daily, monthly and yearly training plan (Beauchamp et al., 2021).

In a sample of junior elite Spanish athletes, the creation and utilization of competition plans helped the athletes keep their focus on the task at hand (González-Hernández et al., 2019). The creation of these plans also leads to enhancing communication between the athletes and their

coaches, which promotes the mental and overall growth of the athlete (González-Hernández et al., 2019). The consolidation and refinement of pre-competition and competition skills should continue to be nurtured throughout development and progression through all stages of the podium pathway.

As the ratio of competition increases in this stage in comparison to the T2T stage (i.e. 40%-60%), the recommendation by LTD plans regarding competitions shows a decrease from the T2T-T2C stage (i.e., 36%-34%). With a proposed 20% increase in competition focus, it would intuitively seem that there should also be increased awareness and focus on the development on competition plans to aid in this transition.

As both pre-competition and competition plans and routines need to be curated to the individual needs of the athlete (Dohme et al., 2019), the importance of developing, using, and evaluating the effectiveness of these plans would seem to be a priority for all athletes in the T2C stage. These plans are utilized to help reduce feelings of anxiety, and provide focus for the athlete prior to competing. They are also a useful tool in the reflection process of athletes for them to learn and modify their future training (González-Hernández et al., 2019).

### ***Individual Psychological Preparation***

The category “*Individual Psychological Preparation*” was the third highest reported in the T2C stage (30%). As previously stated, the T2C stage is the onset of high-performance competition where the athletes begin to take personal bearing on the successes and failures in their sport (Blijlevens et al., 2018; Higgs et al., 2019; Pankow et al., 2020). Similar to the T2T stage, the continued development of individual psychological skills aids each athletes ability to manage thoughts, feelings, and behaviors prior to competing is beneficial in a wide range of ages and athletes (Gould & Maynard, 2009). Development and refinement of individual psychological

skills to aid in the competitive performance aspect of their sport is a major tenet in the T2C stage. Due to the increased pressure and expectation in the T2C stage, each athlete begins to develop a personal claim in their sport and therefore creates their own psychological process towards training and competition. In relation to the T2T stage, the content of “*Individual Psychological Preparation*” remained consistent at 30%. Even with the shift in training-competition (40%-60%) in the T2C stage, it is positive to see the same demand psychological preparation is being recommended throughout the stages of development. As athletes become increasingly more individualized in terms of their strengths and weakness (i.e., as identified in their gap analysis), it increasingly becomes important in the T2C stage to not only maintain the focus in individual psychological preparation but to start to recognize the idiographic nature of the content and its delivery.

### ***Goal Setting***

“*Goal Setting*”, was reported category at 28% by NSOs in this stage. Goal setting is a skill that aligns with the both the intrinsic desires these athletes have regarding their passion for the sport and the personal goals they have set as well as working towards the performance and outcome goals of podium results. These goals are cultivated and progress as the athletes continue through the T2C stage and onto the T2W stage. Due to the increase in intensity in the T2C stage, the goals being made should align with the trajectory of the athletes’ career and should embody goals within the T2C stage and one's that can be built upon in the T2W stage. Goal setting provides a template for individuals to maintain focused, aid in determination and confidence, while also providing an opportunity for the individuals to evaluate their progress (Dohme et al., 2019).

As individuals have actively chosen to continue on in sport (i.e., chosen the podium pathway), developing and striving towards performance and outcome goals becomes more important and prevalent in this stage (Higgs et al., 2019). Providing a clear path with an end target gives direction for their physical, technical, tactical, and psychological training, which all contribute to sustained excellence and an athletes' success (MacNamara et al., 2010). As noted by a sample of 16-18 year old junior elite soccer players, the development of goals aided to increase the positive atmosphere surrounding their sport (Gomes et al., 2020). From an individual standpoint, creating goals throughout the season provided feelings of achievement and success which positively impacted the athletes (Gomes et al., 2020). From the team perspective, creating a season long goal kept the group motivated and focused throughout the entire season (Gomes et al., 2020). The creation of goals aided this junior elite soccer team to create positive relationships with both teammates and coaches, which has shown to positively impact sport performance (Gomes et al., 2020).

As there is an increase in high-performance competition in the T2C stage, it is interesting to note a decrease in the reported use of this skill in comparison to the T2T stage (i.e., moving from 33% in the T2T stage to 28% in the T2C stage). As athletes progress through the stages of podium pathway, it seems intuitive that the use of goal setting in both the daily training environment and competition settings would increase (e.g., not only more short, intermediate, and long-term goals but also process, performance, and outcome goals using that athletes Yearly Training Plan (YTP) and Individualized Performance Plan (IPP)) to direct focus, mobilize effort, increase persistence, and develop new learning strategies for athletes in the T2C stage. There is still a requirement of similar recommendation of PST regardless of the time allotted to training.

### ***Arousal, Anxiety & Stress Management***

The category of “*Arousal, Anxiety & Stress Management*” (11%) is recommended to aid in the emotional regulation of athletes in this stage. Athletes in high performance conditions have had to learn how to deal with adverse situations and grow from them in order to excel further in their sport ( MacNamara et al., 2010). Stress is not inherently negative, if the proper guidance towards management and skill development are provided (Beauchamp et al., 2021). It has also been seen that elite performers who have a variety of psychological skills at their disposal and are able to use them in stressful situations are able to better cope with difficult situations and struggles in development (e.g., transitioning from T2T – T2C) ( MacNamara et al., 2010). It is expected in the T2C stage that athletes have advanced mental and emotional management skills and are moving towards performing consistently in high-performance environments (i.e., training and competition) (Higgs et al., 2019).

When analyzing the coping skills of adolescent athletes, it is noted that there is a lack of skills for these athletes to utilize in stressful situations (Campbell et al., 2018). Partially due to the pressure placed on these athletes, learning adaptive coping skills is crucial for them to address stressful situations, and manage symptoms of anxiety in order to focus on their performance (Campbell et al., 2018). It is suggested to provide athletes with adaptive coping skills that are appropriate with their level of sport (i.e., T2C) while also providing opportunities for growth on these skills as they mature through stages of sport and development (i.e., T2T-T2C) (Campbell et al., 2018). This is important as the stressful situations change as the athletes

age and mature, which enforces teaching coping skills that can be built upon throughout the years (Campbell et al., 2018).

The decrease in the of recommended practice of this psychological skill (i.e., arousal, anxiety, and stress management) from the T2T stage to T2C stage (i.e., from 24% - 11%) is interesting. If the expectation and pressure placed on athletes is increased in the T2C stage regarding performance and performance outcome, sufficient arousal, anxiety, and stress management skills training should be a priority to this stage of athletes.

### ***External Factors***

The category “*External Factors*” (11%) depicts the peripheral influences (i.e., crowd, weather, stadium differences, and competitors) that must be accounted for during the T2C stage. With the increase of competition in a high-performance setting (i.e., National competitions), there is an increase in factors and pressures that could play a part in the athletes’ performance. As the number of national and international competitions increase with higher performance expectations, the psychological preparation for these events must be addressed in the T2C stage (Higgs et al., 2019). When analyzing the optimal development of junior elite athletic athletes, the management of external factors played a role when developing goals and a race plan (Menting et al., 2019). An athletes’ behaviour can be largely impacted by their external environment (i.e., competitors or weather), therefore, developing psychological skills to effectively manage an athletes thoughts and feelings related to these factors is crucial in order to stay focused on the task at hand (Menting et al., 2019). Also, external factors outside of the sport context such as school and personal relationships can influence the athletes in this stage (Bell et al., 2020). Therefore, the development of psychological skills in reference to external factors can be utilized to aid in many aspects of the athletes’ life. However, there is a decrease of recommendation of

this category from the T2T stage to the T2C stage (17%-11%). As the athletes begin to mature and expose themselves an ever-increasing number of environments, it is important to develop athletes who have psychological skills to successfully perform while managing external factors.

### ***Focus/Refocus; Sport Enjoyment***

The categories of “*Focus/Refocus*” and “*Sport Enjoyment*” were recommended by NSO’s at 9% in the T2C stage. Given the expectations and pressures placed on athletes, ensuring that athletes are sufficiently equipped with the psychological skills to be able focus and refocus is crucial in order to aim for success (Golby & Wood, 2016). “*Focus/Refocus*” is a psychological skill that works towards narrowing one field of view to focus on the task at hand (Nideffer, 1996). The use of this psychological skill can aid in removing external stimuli and tailoring their focus to the desired task. A 10-month intervention of psychological skills indicated that focus and refocus skills were positively impacted by consistent development and monitoring over a span of two competitive seasons in junior elite female gymnasts (Fournier et al., 2005). It was noted by athletes, coaches and administrators that the performance abilities of these athletes improved through the intervention of focus/refocus skills (Fournier et al., 2005). Seeing the implementation of focus skills in athletes in the T2C stage for two seasons allowed this pool of athletes to improve their performances in competition settings by staying focused on the task at hand (Fournier et al., 2005). Within the T2C stage, there is an increase in competition and performance demand, which requires athletes to be more precise and focused while performing. Nothing that only 9% of NSOs suggest training this psychological skill in the T2C stage, proposing a more frequent, and continual implementation of focus/refocus skills would be useful.

The category “*Sport Enjoyment*” stayed consistent from the T2T stage to the T2C stage (both 9%). As competitions increase, it is important to ensure that the participants are actively

engaged in their activities. Developing a positive training atmosphere is crucial for this stage of athletes as the increase of intensity, pressure and expectation can negatively impact the wellbeing of athletes (Menting et al., 2019). Even though the focus of the sport may shift (i.e., participation vs. success), the enjoyment factor should evolve accordingly. With this shift in the T2C stage, evolving and sustaining a sense of enjoyment is important to maintain participation and development throughout athletes (i.e., transitioning from T2C to T2W).

### ***Teamwork Components***

The category of “*Teamwork Components*” would show value in team-based sports, to aid in the developing of interpersonal relationships between team members (Pankow et al., 2020). However, in the T2C stage, it was recommended by only 7% of the NSOs of our sample. The relationships between individuals in the T2C stage become more important as peer interaction and expectation increases (Visek et al., 2013). Therefore, there should be increased exposure to psychological skills that can educate and help cultivate positive relationships between peers and teammates (Visek et al., 2013). However, the shift from T2T to T2C does not account for this developmental shift in this population (i.e. 13% - 7%). With this increased peer expectation in relationship styles, the T2C stage should be accommodating to those needs. Introducing athletes in the T2C stage how develop positive and healthy working relationships would provide benefit for them as they continue through the T2C stage, and onto the T2W stage. As noted by many athletes, it is a collective group that assists in the success of an athlete, which is important to prioritize throughout development. This teamwork development is crucial in team and coach relationships, as well as the relationships built with an athlete's IST.



### ***Communication; Self-Talk***

Finally, the categories, “*Communication*” (4%) and “*Self-Talk*” (2%) showed the lowest recommendation in this stage. Interestingly, Self-Talk has been associated with increased self-confidence in junior athletes, which could suggest its importance to be taught to individuals in athletic situations (Mamassis & Doganis, 2004). A season long intervention of a Mental Training Plan was introduced to elite tennis athletes and was shown to be a part of the psychological routine of these athletes in order to mentally prepare for a match, and properly recover throughout the match (Mamassis & Doganis, 2004). The usage of a season long Mental Training Plan provided sufficient time for the athletes in the T2C stage to learn, understand, and implement the psychological skills and help reduce performance weaknesses (Mamassis & Doganis, 2004). As noted by the athletes, the introduction and usage of self-talk was a crucial component to the growth and success of these athletes (Mamassis & Doganis, 2004). Providing these athletes with sufficient time (i.e., season long) and opportunity (i.e., increased competition in the T2C stage) to understand and implement self-talk was useful in seeing its efficacy (Mamassis & Doganis, 2004). From an already a low recommendation, Self-Talk decreased from the T2T stage to the T2C stage (i.e., 4%-2%). As indicated by research, it would be useful to increase the Self-Talk as it is reported to be a beneficial asset for athletes. Based on the findings from Mamassis et al., (2004), self-talk for junior elite athletes allowed athletes to feel mentally prepared and confident prior to competing. Self-talk is a beneficial tool during the T2C stage as it can aid self-confidence and help optimize an athlete’s performance.

“*Communication*” is needed in the T2C stage it is in the stage that the athletes begin working more fully with a high performance team consisting of coaches, practitioners and other

high performance athletes (Higgs et al., 2019). As athletes are becoming more involved and stake a personal claim in their sport, increasing effective communication would be useful to get an increased understanding of the athletes' goals and expectations throughout training and competition. However, there lacks research in the impact of communication in the T2C population, which also relates to the small prescription provided to this skill (i.e.,4%).

The T2C stage is where athletes should begin performing at a consistently higher level, and begin performing at national and international level competitions. The time spent on sport specific training increases to begin refinement of more sport specific skills. With the additional competitions in this stage, it is important to provide psychological skills to aid in these environments.

### **Train to Win**

In the T2W stage, the objective is to achieve international success while consolidating the physical, technical, tactical, mental and emotional skills previously learnt. The focus in the T2W stage is to apply the athlete's abilities in performance and strive for success (i.e., podium placement) in National and International events (Higgs et al., 2019). With this expectation, athletes are assumed to have consolidated physical, technical, tactical, and psychological skills and use them in both training and competition settings (Higgs et al., 2019).

### ***Psychological Skills and Development***

In the T2W stage, "*Psychological Skills and Development*" was reported 45% across NSO'S, reinforcing skills regarding mental fitness and cognitive development. In Olympic athletes, psychological skills have shown to have a positive effect on the performance of athletes on the International Stage (Greenleaf et al., 2001). Specifically, psychological factors consisting of mental skills and preparation were key pillars to aid in the positive affect that resulted in the

optimal performances at the Olympic Games (Greenleaf et al., 2001). Similarly, in elite athletes, the development and maintenance of psychological skills provided athletes with the tools to perform both in practice and competition (Durand-Bush & Salmela, 2002). In the T2W stage, the recommendation of “*Psychological Skills and Development*” increased from the T2C stage (i.e., 41% - 45%), which suggests that NSOs view the value and importance of training psychological skills even during the consolidation phase.

### ***Competition Plans/Routines***

As individuals in the T2W stage are often mature, professionals in their field, they have developed and refined their “*Competition Plans/Routines*”. This category was represented in 45% of sports across NSO as these psychological skills can provide structure and a routine for individuals to follow prior to training/competition (Higgs et al., 2019). Athletes with well-established pre-competition routines are seen to be more capable to perform at their highest ability (Orlick & Partington, 1988). Athletes at the T2W stage are aiming for success in international competitive situations and require an individual psychological plan to mentally prepare for these situations. It has been recognized that “*Competition Plans/Routines*” can be beneficial in diminishing intrusive thoughts that may be distracting or debilitating prior to competing (Hanton et al., 2005). Athletes within the T2W stage who noted that when debilitating and negative thoughts began to creep in, referring back to their competition routine helped re-focus the athletes on the task at hand (Hanton et al., 2005).

In a sample of Norwegian female elite-athletes, it was found that with the increased intensity on performance and competition, athletes who began to incorporate strategic planning with provided a competitive edge which aided the athletes (Jordalen et al., 2019). The development and maintenance of planning for practice/competition provided the athletes with a

sense of self-control and motivated them to work hard during their training and performance programs (Jordalen et al., 2019). The creation and maintenance of performance routines is cited to be a positive factor in relation to performance of Olympic athletes as it provides stability and can aid in eliminating distractions from an athletes performance (Greenleaf et al., 2001). Athletes at the highest level of sport still require systems and routines in order to psychologically prepare to compete at the highest level of competition. In comparison to the T2C stage, there is an increase in the prescription of these psychological skills (i.e. from 34% in T2C to 45% in the T2W stage) which supports the importance of nurturing and developing this psychological skill in the T2W stage.

### ***Individual Psychological Preparation***

The role of proper individualized preparation throughout training and competition aided athletes competing in the Olympics by creating a positive atmosphere prior to competing (Greenleaf et al., 2001). The preparation of both intrinsic (e.g., sport enjoyment) and extrinsic (e.g., external validation) factors must be developed for athletes competing on the international stage as there are various stimuli that may come into play and by creating programs to aid in the adjustment and preparedness to perform at this level of competition allows athletes to prepare optimally (Greenleaf et al., 2001). For athletes competing at the highest level, the development and maintenance of psychological skills within the “*Individual Psychological Preparation*” category has shown to aid in targeting training towards the ultimate goal the athletes have (i.e., peak performance at the Olympics) (Greenleaf et al., 2001). There is a slight decrease in the prescription of this category from the T2C stage (i.e. 30% to 28% in the T2W stage). Athletes mature, they should become more independent with increased awareness of their needs leading to the individualization of their psychological preparation for optimal performance. Given the

increase in competition and pressures associated with the T2W stage, increased importance should be placed on the refinement and consolidation of “*Individual Psychological Preparation*”.

### ***Goal Setting***

The category of “*Goal Setting*” was prescribed at 28% across NSO’s at the T2W stage. It has been seen that goal setting is an element that can differentiate between successful and unsuccessful athletes (Durand-Bush & Salmela, 2002). Greenleaf et al. (2001), found a number of factors that influenced Olympic performers at both the Atlanta (1996) and Nagano (1998) Olympics. Three athletes noted that their main goal for the Olympics was achieving peak performance and also cited “my goal was making the Olympic team..... for me that was just the beginning” (p. 166) indicating that multiple goals can be set throughout the year and they can work towards achieving larger, long-term goals (Greenleaf et al., 2001). The duration of goal setting is an extended period which has short-term goals and accomplishments to work towards a long-term goal. This provides athletes with daily, monthly, and yearly goal setting plans to work towards. Developing the proper preparation prior to training/competing is key to seeing peak performance at the highest level of competition (Durand-Bush & Salmela, 2002; Greenleaf et al., 2001). The creation and focus towards goal setting at this stage also indicated positive emotions towards the overall perception of the Olympic Games, which gives focus and drive towards achieving peak performance at the Games (Greenleaf et al., 2001). The recommendation of “*Goal Setting*” in the T2W stage is consistent to the prescription of the skill in the T2C stage (i.e., both 28%). With the increase of competition in the T2W stage (i.e., 30% Training – 70% Competition), increased focus on goal setting related to yearly training plans, gap analyses, and

individualized performance plans related to achieving peak performances at competitions would be ideal.

### ***External Factors***

At the T2W stage, a primary focus is the refinement of sport specific skills in high-performance conditions (i.e., international competitions) (Higgs et al., 2019). As athletes have been performing at a high standard for a number of years, performing at a high level at important competitions becomes vital to the success of the athletes (Pankow et al., 2020). With this added pressure it is also seen that athletes are held at higher expectation, both from themselves and from society (Higgs et al., 2019). This creates a focus to work on managing the “*External Factors*” (e.g., crowd, weather, stadium differences, and competitors), which was prescribed at 17% across NSO’s. This is an element of sport which can deter focus on task appropriate cues and have a negative impact the individual’s performance. Being able to direct one's focus on the task at hand can be beneficial in controlling the external factors that could impede an athletes focus, and potentially performance (Nideffer, 1996). There is increased pressure and expectation throughout this stage, therefore extensive mental preparation is crucial to adhere to these external pressures (Durand-Bush & Salmela, 2002). In a sample of elite international athletes, by blocking out external factors such as stressors and outside pressures, they found it easier to focus on the task in front of them (Durand-Bush & Salmela, 2002). In comparison to the T2C stage, there is an increase in the recommendation of this psychological skill to T2W athletes (i.e. from 11% in the T2C stage to 17% in the T2W stage).

### ***Focus/Refocus***

With there being an increase in international competition at the T2W stage, skills regarding “*Focus/Refocus*”, were prescribed in 15% of NSO’s. As the ratio of competition-

training is 70% - 30%, it is important to prepare athletes for the competition environment (Higgs et al., 2019). Pankow et al. (2020), acknowledged that psychological skills being taught at this stage should address performance-focused psychological skills. Providing athletes with the psychological skills to focus on the task at hand throughout a competition coincides with the main goals of the T2W stage. Ensuring peak performance at competitions is crucial to these athletes and providing them with the psychological skills to redirect focus to the task at hand is critical for T2W athletes (Nideffer, 1996; Pankow et al., 2020). The psychological skill “*Focus/Refocus*” increased from the T2C stage (i.e., 8%) to 15% in the T2W stage. Given the need for optimal performance (i.e., on task) focus will positively impact the performance in the T2W stage, thus psychological focus and refocus skills are essential.

### ***Teamwork Components; Arousal, Anxiety & Stress Management***

The psychological skills in the categories of “*Teamwork Components*” and “*Arousal, Anxiety & Stress Management*” were prescribed 13% in the T2W stage. In a sample of elite British athletes, factors such as increased anxiety have shown to be debilitating for athletes, therefore, developing and refining coping skills is important to help athletes perform in high pressure competitions (Hanton et al., 2005). This sample of athletes had previous experience dealing with symptoms of anxiety and the findings of this research indicated that the symptoms and skills utilized by these athletes throughout their careers led them to an elite status. Having the athletes become aware and develop coping skills for their symptoms, anxiety, and stress as they progressed through sport aided in their progression to the elite level of sport.

As the expectation of athletes in this stage (i.e., T2W) is to achieve peak performance at the highest level of competition, an array of skills (i.e., psychological and emotional) must be

utilized to aid in arousal regulation (Blijlevens et al., 2018). With these added pressures, increased control over arousal, anxiety, and stress in athletes during training and competition would be beneficial. There is a slight increase in the recommendation of this psychological skill in comparison to the T2C stage (i.e. 11%) to 13% in the T2W stage. Given the greater amount of perceived pressure at the T2W stage, is this slight increase focused on developing and maintaining the psychological skills attributed to managing arousal, anxiety, and stress enough to consistently place athletes on the podium?

As athletes in team sports specialise in their sport, the psychological skills and components geared towards team cohesion should be aligned with this maturity in sport (Blijlevens et al., 2018). In a sample of mastery-level Dutch gymnasts, the athletes are like-minded in the sense that they all have prioritized their athletic careers at this stage. They are aware that their dedication and the dedication of their teammates are crucial to optimal performance and group success (Blijlevens et al., 2018). As the psychological needs and psychological components vary from individual to team sports, it is important to address the proper skills to aid in the development of athletes within a team (Blijlevens et al., 2018). Similarly to the T2C stage, *Teamwork Components* are dependent on the sport type, but still are linked to increasing interpersonal relationships (i.e., respect, professionalism, and cohesion) between teammates (Blijlevens et al., 2018; Pankow et al., 2020). There is an increase from the T2C to T2W stage for *Teamwork Components* (i.e. from 7%- 13%). Given the research stating that team athletes begin to specialise and focus more directly towards the team elements of sport (e.g., team cohesion, team goals, group think and success) as they progress through the stages of development, working on the cohesion of a team and developing a competitive environment is an important element to athletic success (Blijlevens et al., 2018).



### ***Imagery/Visualization; Sport Enjoyment***

“*Imagery/Visualization*” and “*Sport Enjoyment*” were both prescribed at the same frequency (11%). “*Imagery/Visualization*” was shown to be an important factor in the psychological toolbox of elite hockey players and the use of “*Imagery/Visualization*” as athletes progressed and transitioned through phases of development (i.e. T2C - T2W) aided these athletes in their focus abilities and their overall self-confidence to achieve tasks (Pankow et al., 2020). The use of Imagery/Visualization throughout stages (i.e., T2T, T2C, T2W) demonstrates NSO’s consider this a skill that can aid athletes to excel in the elite level of sport (Pankow et al., 2020). In conjunction with other skills (i.e., self-talk, thought stopping), “*Imagery/Visualization*” is a valuable element in the progression of elite athletes and is attributed to a portion of their success (Pankow et al., 2020). Given the stated importance of this psychological skill for athletes in this stage, the given prescription of this skill (i.e., 11%) does not align with the needs of athletes in this stage.

As athletes are often adults in the T2W stage, the choice to stay and pursue their sport aligns with the enjoyment they have in their sport. Athletes who have chosen to continue pursuing their sport and actively participate in the journey towards their goal are looking for a positive sport environment (Durand-Bush & Salmela, 2002). In the sample of elite Dutch gymnasts, the athletes developed a passion for their sport and a hunger for competition and success which motivated to stay in sport (Blijlevens et al., 2018). The intrinsic desire to stay and work towards excellence must be aligned with aspects of enjoyment (Pankow et al., 2020). This element of enjoyment is most successful when fostered and nurtured throughout the athletes

journey in sport, (i.e., beginning in developmental stages and progressing through to elite level) (Blijlevens et al., 2018; Pankow et al., 2020). In comparison to the T2C stage, the focus on “*Sport Enjoyment*” increases when entering the T2W stage (i.e. from 9% to 11%). This small increase indicates that a focus on ensuring enjoyment when the pressures and expectation of sport and performance increase slightly when entering the T2W stage.

### ***Self-Talk; Communication***

“*Self-Talk*” and “*Communication*” were the least prescribed categories (i.e., both at 2%) in the T2W stage. *Self-Talk* has shown to aid in the self-confidence, arousal levels and overall preparation of athletes prior to competition (Milavic et al., 2019). In conjunction with imagery/visualization, “*Self-Talk*” was a skill utilized by elite hockey players to increase confidence and to deal with adversity in sport (Pankow et al., 2020). Also, when studying a group of Olympic athletes, all reported using “*Self-Talk*” to help keep them focused, motivated and increase their confidence during their preparation for competition (Durand-Bush & Salmela, 2002). The recommendation of “*Self-Talk*” is consistent in both the T2C and T2W stages (i.e., 2%) and seems to be a skill that is utilized throughout an athlete’s journey in sport alongside various other psychological skills. Given the request by athletes and support in the literature for the positive effect Self- Talk can have on performance in the T2W stage, an increase in skill prescription and development should be implemented (Durand-Bush & Salmela, 2002)..

A lack of communication can lead to distrust and confusion, which then can result in lesser performance and poor results at the Olympic Games (Durand-Bush & Salmela, 2002). Reflection and evaluation led a sample of elite athletes and their coaching staff to the understanding that the importance of communication is crucial in aiding focus and mediating

stress levels, particularly at the highest level of competition (Durand-Bush & Salmela, 2002). During the journey and between Olympic games, it was discovered that increasing communication is a valuable tool in creating a functional and successful training environment to allow the athletes the best opportunity for success (Durand-Bush & Salmela, 2002). In comparison to the T2C stage, there is a decrease when progressing to the T2W stage (i.e. from 4% in the T2C stage to 2% in the T2W stage). Given the importance of clear communication at the highest levels of competing are important, ensuring adequate communication skills are being prescribed and executed at the T2W stage are crucial to optimize performance.

The podium expectation of these athletes in the T2W stage is increased and the pressure to perform and succeed at an international level is a priority (Higgs et al., 2019). Athletes are expected to have a rigorous training regime, with calculated rest periods and increased sport specific training (Higgs et al., 2019). Psychological skills should not only be associated with the recovery process, but also in the management related to the pressures of performing at high levels multiple times within a competitive season to achieve podium performances.

### **Overview of the three stages**

As highlighted by the original LTD model, each stage has its individual focuses to lead athletes towards excellence (MacNeil et al., 2014). It is important for the psychological skills taught at these stages to align with the requirements of each stage. Reviews and adjustments should be made to the psychological skills being taught if they are to be consistent with the concentrations of each stage. As stated by Banack et al. (2012), individualized PST is important to focus on the specific needs of both the individual and sport types. As the requirements of athletes vary as they progress through the stages of development, it is important to individualize the PST in order to facilitate the needs of various athlete types (Milavic et al., 2019). A proper

assessment of the needs of the athletes within and across sport types is important to ensure the proper psychological skills are being taught to the correct audience (Milavic et al., 2019).

Given the current definition of the LTD, a central focus in this model is the continual progression and development of skills to allow athletes to reach their maximum potential in their desired sport. Findings of this research indicate that PST is not consistently prescribed throughout the stages as only one category “*Focus/Refocus*”, showed an increased prescription throughout the three stages (i.e., from 6% in the T2T stage to 9% in the T2C stage to 15% in the T2W stage). In sport, there are many high-pressure situations which can have an impact on attentional focus, confidence, and emotional regulation (Hjelm & Taylor, 2022). The psychological skill of self-talk has shown to be a benefactor in performance and success of various athletes used to enhance attentional focus, boost confidence, and aid in emotional regulation (Hjelm & Taylor, 2022; Van Raalte et al., 2016). “*Self-Talk*” showed a decrease from the T2T-T2C stages (i.e., 4% in the T2T stage to 2% in the T2C stage and 2% in the T2W stage). In each of the three stages (i.e., T2T, T2C and T2W), “*Self-Talk*” was recommended less than 10%.

The category of “*Communication*” also consistently decreased in frequency of prescription as it progressed through all the stages (i.e., 9% in the T2T stage to 4% in the T2C stage and 2% in the T2W stage). Administering clear and concise communication has shown to be a factor in elite athletes success and performance in competitions (Durand-Bush & Salmela, 2002). As communication consists of athletes, coaches, and support staff, there are many individuals who are involved in the training environment and because strong communication between members can aid in the athletes achieving peak performance (Durand-Bush & Salmela, 2002).

The category of “*Psychological skills and Development*” was prominent across all stages (i.e., 49% in T2T to 40% in T2C and 45% in T2W), however, the frequency of recommendation varied based on stage. Given the requirement for systematic progression of psychological skills to optimize understanding, the recommendation of this category would be to see a continual advancement throughout the stages (Farrow & Robertson, 2016; Milavic et al., 2019).

“*Competition Plans/Routines*” were similar in the T2T-T2C stages (i.e., 36% in the T2T stage) and 34% in the T2C stage and then increased into the T2W stage (i.e., 45%). Athletes have noted that developing and maintaining plans/routines are a beneficial element to continuing focus on the task at hand (i.e., competition performance) (Etxebarria et al., 2019).

Similarly, for the category of “*External Factors*” there was decrease between T2T (i.e., 17%) to 1% in the T2C stage and increasing again in the T2W stage (i.e., 17%). Developing psychological skills to account for and manage external factors (i.e., crowd, weather, stadium differences, and competitors) are beneficial in the progression of athletes (Menting et al., 2019).

The category of “*Teamwork Components*” followed a similar trend by decreasing from the T2T stage (i.e., 13%) to the T2C stage (i.e., 6%) and rising again into the T2W stage (i.e., 13%). The development of a strong team through the use of team-based psychological skills (i.e., group think, working with others, and goal setting) can aid in the progression and potential success of the group (Blijlevens et al., 2018).

For the category “*Arousal, Anxiety & Stress Management*” there was a steep decline from the T2T stage (i.e., 23%) to the T2C stage (i.e., 11%), but slightly increasing when entering the T2W stage (i.e., 13%)

For the skills under the category “*Individual Psychological Preparation*”, there was a consistency between the T2T - T2C stages (i.e., 30%) but a decrease in the T2W stage (i.e.,

28%). In a sample of minor league, junior, and elite hockey players, the development of individual psychological preparation skills are valuable to account for the psychological needs of each individual and allow them to psychologically develop through the stages in sport (Pankow et al., 2020)

The category “*Goal Setting*” showed a decrease between T2T (i.e., 32%) and T2C (i.e., 28%) and stayed consistent into the T2W stage (i.e., 28%). The psychological skill of goal setting is noted as a valuable tool and can help provide a path for athletes to follow throughout their time in sport (Harwood et al., 2004).

On a similar trend, the category “*Sport Enjoyment*” stayed consistent between the T2T and T2C stages (i.e., 9%) then showed an increase when progressing to the T2W stage (i.e., 11%). In order to maintain involvement in sport, there must be an element of sport enjoyment in order to motivate and engage athletes (Durand-Bush & Salmela, 2002)

The inconsistencies in skill prescription is concerning as it contradicts the recommended skill progression throughout stages (Blijlevens et al., 2018; Farrow & Robertson, 2016; Milavic et al., 2019). The fluctuations in the prescription of psychological skills leads to question of how psychological skills are introduced, developed, monitored and evaluated. As noted by Blijlevens et al. (2018), the continuous progression of psychological skills provides a strong foundation for the athletes to reach success.

### **Content Analysis**

The findings of this research reveal the current psychological skills being prescribed by various NSOs’ and the percentage that are seen throughout the various sports and stages of development. The categories extracted from the content analysis display the types of psychological skills being taught in various Canadian Sport for Life (CS4L) sport models. The

psychological skills were organized into categories in order to clearly categorize these psychological skills.

In both the T2T and T2C stages, the category of Psychological Skills and Development was seen to be most predominant (49% in T2T and 40% in T2C). The category of “*Psychological Skills and Development*” consists of elements that work on developing and consolidating skills towards approaching and reacting towards athletic events from a psychological manner.

In the T2W stage, the categories of “*Psychological Skills and Development*” and “*Competition Plans/Routines*” were the most prominent (i.e., 45%). In general, the findings from the present research supports previous research with the content analysis that there is insufficient progression of PST throughout stages of development (Blijlevens et al., 2018; MacNeil et al., 2014; Pankow et al., 2020). Therefore, sport organizations should monitor and evaluate PST at each stage of development and provide areas of growth and improvement as athletes develop through their respective sport.

## **Sports Types**

For the purpose of this research, sport types were created to examine how PST differs across sport types (i.e., Individual Sports; Team sports; Combative Sports; and Artistic Sports). The creation of these groups may provide insight into the type of PST being prescribed to sports (i.e., team vs individual). As this research is novel and looking to better understand PST in LTD models, separating sports into groups provided the researcher with an additional lens to compare and contrast PST throughout NSOs. Sports were placed into their respective sport type based on the primary focus/goal of the sport. For example, a sport such as Gymnastic could be categorized as both Individual Sport and Artistic, however, a primary focus is the artistic elements alongside

the performance of the skills. Therefore, gymnastics is categorized under the artistic sport group. This content analysis was conducted to examine if differences in PST recommendations are a function of the types of sport athletes compete in.

### ***Individual Sports***

For the individual sport group, NSOs reported the categories of *Competition Plans and Routines* (i.e., 65%), and “*Psychological Skills & Development*” (i.e., 48%) within their LTD. The implementation of PST can work on developing individual psychological characteristics such as work ethic and discipline (Pankow et al., 2020). Also noted by Pankow (2020), the individual development of psychological skills is valuable in order to see development in other areas (i.e., communication, and physical training).

Throughout the three stages discussed in this research (T2T; T2C; T2W) the development and usage of individual plans and routines prior/during an athletic performance is an element of athletic progression and development through sport (Pankow et al., 2020). It has been demonstrated that structured plans and routines allowed athletes to continue developing in their sport and for some to reach the pinnacle of their sport (i.e., hockey athletes making the NHL) (Pankow et al., 2020). Providing skills that allow athletes to harness the intrinsic motivation is important for individual progression and success throughout their sport (Minjina, 2014). Developing individual athletes plans and routines that are utilized from the developmental years and carried into the elite stages of sport are seen to benefit the athlete and experiences of the individual (Minjina, 2014; Pankow et al., 2020).



## ***Team Sports***

Team-based sports showcase an emphasis on “*Psychological Skills and Development*” (i.e., 93%), followed by “*Goal Setting*” (i.e., 43%). Uniquely, in the team-based sport type, the psychological skill “*Team Dynamics*” (i.e., 29%) was seen to be prescribed in a handful of sports. Given the format of a team sport is heavily weighed on the efficacy and production of the athletes as a group, it could be suggested there needs to be greater focus towards developing strong team dynamics. This would account for the relations between athletes in a team setting and how-to manage and excel in this environment.

As noted by Milavic et al. (2019), there are increased pressures in a team environment with many elements out of an individual control, which could be mitigated by coping mechanisms. These coping mechanisms consisted of skills regarding self-confidence, peak performance under pressure and an increased control of competitive state anxiety (Milavic et al., 2019). In adolescents and developing athletes, team sports are primarily based on biological age (Visek et al., 2013). As the athletes mature and progress through the stages (i.e. T2T - T2C - T2W), the psychological requirements of the athletes evolve depending on the biological and chronological requirements of the individual.

Thus, athletes require training in specific psychological skills throughout their progression (i.e., T2T, T2C, and T2W) and it is important to account for the changes in development and integration of multiple individuals in a team setting (Visek et al., 2013). Considering the functioning of the team is a crucial aspect to the success of the team, increased PST towards *Team Dynamics* could be beneficial in order to facilitate the needs of group.

### ***Combative Sports***

For combative sports, the category of *Psychological Skills and Development* (75%) was the most recommended by NSOs. In the experience of an International Taekwondo athlete, it was seen that PST could be beneficial to success of athletes of a combative nature (Lim & O'Sullivan, 2016). Studying the psychological skills used by this Taekwondo athlete four months prior to the 2012 London Olympics, skills such as self-talk, imagery, goal setting, anxiety management and maintaining peak performance were used by combative athletes and shown to be a resource to these athletes in their athletic journey (Lim & O'Sullivan, 2016). The addition of psychological skills training allowed this athlete to feel mentally prepared and optimize their performance at the highest level of competition (i.e., Olympics) (Lim & O'Sullivan, 2016).

In combative sports, there is the drive to succeed in their sport, while also preventing the chance of injury, which is often hard to achieve both of these things (Minjina, 2014). PST should account for both the technical elements of the sport, while also ensuring the athletes are mentally fit enough to challenge themselves with the potential chance of injury (Minjina, 2014). However, due to the small sample size of combative sports ( $n= 3$ ), it is difficult to assume that these psychological skills are recommended to all types of combative sports. Nevertheless, the instruction and development of these psychological skills (e.g., psychological skills development, self-talk, and focus/refocus) are crucial to the improvement of athletes and should be integrated at various levels of development.

### ***Artistic Sports***

Artistic Sports reported psychological skills in the *Competition Plans and Routines* and *Arousal, Anxiety and Stress Management* categories most often (i.e., both 100%) prescribed to their athletes. Artistic athletes must be mentally prepared in order to perform both technically

and artistically. Developing an effective performance plan has been shown to aid in the preparedness of gymnasts as it elicits a similar atmosphere to a competition, in order to prepare for the psychological demands needed by their sport (Miliadis et al., 2011).

In artistic sports, heightened emotions are often present, which require certain psychological skills to learn to adapt and harness control of these emotions (Miliadis et al., 2011). Gymnasts found with the implementation of psychological skills training, there was a reduction in anxiety symptoms (e.g., stress, increased heart rate, and negative thoughts) which helped to optimize performance (Miliadis et al., 2011).

With a focus of artistic sports being geared towards developing a proper and clean performances, artistic athletes must develop detailed and well executed plans and routines (Wann et al., 2008). Alongside the technical aspects of sport, these athletes also have to incorporate an artistic element. The psychological skills within the category *Competition Plans and Routines* could aid in supporting the elements of focus however, psychological skills geared towards the emotional, technical and focus elements of the sport should be supported as well.

Summary from this research indicate inconsistencies across the skills being prescribed at various stages of athlete development (i.e., T2T, T2C, and T2W). When comparing the skills in the various sports and the stages, it was more common that skills would not be taught consistently than them being taught. Developing and progressing psychological skills at a younger stage (i.e., T2T) provides a foundation for these skills to continue to flourish and develop throughout future stages (i.e., T2C and T2W) which can be used in the future to aid in athletic performance (Pankow et al., 2020). A structured, longitudinal skill monitoring system has shown to benefit the development of various skills in the athletic population (Farrow & Robertson, 2016). In the research by Pankow et al. (2020), athletes were taught foundational

psychological skills which they later used to develop and consolidate psychological skills and characteristics. The progression and continual monitoring and evaluation of psychological skills can aid in the efficacy and production of these psychological skills.

## **Limitations**

It is important to acknowledge the limitations that lie within this research. The primary limitation is that the content analysis can only review material that is posted on the CS4L website, leaving some sports out of the analysis, and only being able to examine the information related to PST that was posted. Any organizations that have since updated their LTD PST plans – these updates will not be reflected within this content analysis. Since the LTD is a “living document”, continual review will be needed to examine the content of NSO’s PST programs.

A secondary focus of the original research plan was to incorporate a questionnaire addressed to National Team Coaches and High-Performance Directors within selected NSOs to gain further insight on current delivery of PST in their respective sport (i.e., to see how the prescription of skills (i.e., Content Analysis) would relate to what is actually being delivered in the training environment). The timing of this study (i.e., between the Summer of 2021 and the Fall of 2022), in which two Olympic Games were occurring within a short time frame (i.e., Tokyo 2021 – July and Beijing 2022 - February) resulted in most NSO’s understandably declining to participate so they focus on their respective Olympic preparation.

Within the content analysis, the categories which were derived are those of the researcher. Due to the nature of a content analysis, there is the opportunity for subjective interpretation which can impact the reliability and validity of results. However, there was review over the creation of the higher order categories and this resulted in an agreeableness over 80%.

## **Future Directions**

Future research should take steps to better understanding the barriers, challenges, and obstacles that impact the prescribed delivery of psychological skills in the T2T, T2C, and T2W stages of athlete's development within each NSO. As each NSO may have differing psychological skills training programs to service the specific needs of their athletes, further research is needed ensure the athletes in each sport are receiving the most effective psychological skill training program.

Additionally, the experience of the athlete and how they perceive the content and delivery of PST in the T2T, T2C, and T2W stages in relation to what is being prescribed in their LTD models is worth investigating. It would be important to see what athletes believe the limitations and/or strengths are within their organization and the impact the delivery of a psychological skills training program has in the daily training environment and their competitive performance. It would also provide further insight into the way psychological skills are used with regard to an athlete's progression through the T2T, T2T, and T2W stages in their respective sports.

## **Knowledge Translation**

The aim of this research is to educate NSO's and athletes on the current PST content with their own NSO and across many NSO's in Canada. By identifying the match (or mismatch) between what is being currently being prescribed to the athletes (i.e., LTD model) and what is possibly being delivered can aid NSO's in evaluating the effectiveness of their LTD plan. The results from this research will be shared with the various NSO's who have participated so they can get a better overview of the ongoing PST delivery to their athletes. This research could benefit athletes across many sports as it provides insight into the structure of psychological skills

being taught across the T2T, T2C, and T2W stages. This research takes the initial step into uncovering the relationship between what is being prescribed in the LTD models, and allows us to take further steps to determine if this is really occurring in day-day training. Given the value and importance of PST in an athlete's development, increasing our understanding of this concept can be a valuable tool in the success of athletes. Ensuring that the proper PST is being conducted at target times of an athlete's development to account for the needs and requirements of the athlete allows for a strong foundation of skills to be further built upon. This can be interpreted by the athletes and NSO's to further strengthen the delivery of future PST in their programs.

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