

2021-10-11

Applied Imagery for Motivation: A Person-centred Model

Rhodes, J

<http://hdl.handle.net/10026.1/17783>

10.1080/1612197X.2021.1987959

International Journal of Sport and Exercise Psychology

Taylor & Francis (Routledge)

All content in PEARL is protected by copyright law. Author manuscripts are made available in accordance with publisher policies. Please cite only the published version using the details provided on the item record or document. In the absence of an open licence (e.g. Creative Commons), permissions for further reuse of content should be sought from the publisher or author.

Applied Imagery for Motivation: A Person-centred Model

Jonathan Rhodes^{a*}

Jon May^a

^a*University of Plymouth, Plymouth, UK.*

*Corresponding Author: Jonathan Rhodes, School of Psychology, University of Plymouth, Plymouth, UK, PL4 8AA. Email: jonathan.rhodes@plymouth.ac.uk

ORCID iD

Jonathan Rhodes: 0000-0002-7921-8242

Jon May: 0000-0001-7439-9200

Word Count (not including abstract or references): 6825.

Abstract: 154

Accepted: 9th September 2021

Authors' copy of the paper to be published as:

Rhodes, J., & May, J. (2021). Applied Imagery for Motivation: A Person-centred Model. *International Journal of Sport and Exercise Psychology*.

Applied Imagery for Motivation: A Person-centred Model

Abstract

Motor imagery when coupled by motivational and cognitive factors have been shown to enhance multiple aspects for sports performance. This paper reviews existing imagery approaches, and proposes a method based on applied applications, intended to increase short and long-term motivation. Behavioural change is achieved by primarily using Motivational Interviewing (MI), then Functional Imagery Training (FIT), which has been adapted into the Applied Imagery for Motivation (AIM) model. AIM starts with an initial interview using MI, then has three imagery phases: macro imagery (beliefs, values and purposeful long-term goal), meso imagery (mentally contrasting between current and future self to evoke change), and micro imagery (planning for immediate action). We explain the use of these three stages which allow athletes to link everyday cues with imagery activation and immediate implementation action plans. We provide practitioners with a comprehensive applied guide to using AIM for performance, merging theory-driven established cognitive and motivational imagery approaches into structured practise.

Keywords: Applied Imagery for Motivation, Functional Imagery Training, Motivational Interviewing, Imagery, Sport

IMAGERY FOR SPORT

Imagery has repeatedly been shown to improve short-term motivation and performance in sport. Techniques that focus on employing cognitive motor and/or motivational imagery in addition to practice, are best suited for performance increments and boosting emotional factors such as confidence (Simonsmeier et al., 2020). In working with psychologists, coaches, and athletes, and leaning on the mediational use of imagery (see Short et al., 2005) there are two main concerns of interest regarding imagery use: how are increments maintained post intervention; and how is negative imagery refocused? Current methods for training cognitive and motivational imagery are well grounded in theory and practice, but there is limited guidance for methods that focus on sustained change post intervention. We acknowledge that imagery training can conjure negative thoughts and there is limited work that examines strategies to refocus thoughts in sports performance.

In this paper, we will review current approaches to the use of imagery in sport, and propose a person-centred model called Applied Imagery for Motivation (AIM) for practitioners to follow, and athletes to experience. We consider the amalgamation of cognitive, motivational and person-centred imagery from theory to practice. Whilst existing motor imagery and other approaches are effective, we propose a hybrid method that is immediately useful for performance, intended to maintain performance and motivational increments over time. The model has been developed over the last few years and preliminary evaluations of its use have been published recently in professional (Rhodes et al., 2018, 2020) and recreational adult sport (Rhodes et al., 2021), and healthcare (Turner et al., 2020). We bring this data together in the concluding sections, to provide directions for future research with the aspiration for AIM to be used by any interdisciplinary practitioner who supports an athlete.

Imagery Approaches and Theories

Imagery approaches in sport including physical, environmental, task, timing, learning, emotion, perspective training (PETTLEP; Holmes & Collins, 2001) and layered stimulus response training (LSRT; Williams et al., 2013) are effective at managing emotions, enhancing confidence, and increasing performance (Smith & Holmes, 2004). These imagery approaches use multisensory exposure when discussing a specific scene which enhances vividness and controllability (Anuar et al., 2018), linked to successful learning outcomes (Smith et al., 2007). To date, short-term imagery interventions, generally lasting between six and eight weeks, have been shown to be effective (Wakefield et al., 2013). During this period athletes are often given a detailed session that trains multisensory imagery by exploring individual imagery ability and application, then invited to use imagery through periodic tasks.

Tasks including standing in a tray of sand whilst visualising a bunker shot (Smith et al., 2008), keeping imagery diaries (Wakefield & Smith, 2011), and watching technical videos (Pocock et al., 2019) have been shown to enhance sports performance. Performance is often measured using two testing points; baseline and a retest after completion of the intervention (Hossini et al., 2019; Toth, et al., 2020). During these timepoints, imagery paired with practice conditions show significant improvements in sport and other domains such as nursing (Wakefield et al., 2020; Wright et al., 2008) and music (Wright et al., 2014). Although motivational and cognitive imagery functions are utilised, there is a lack of research, especially in senior professional sport, that explores what happens to performance in the weeks after the intervention finishes. While the long-term benefits of imagery have been found in youth sport (O et al., 2014), similar approaches seldom yield sustained performance increments at the senior professional level.

IMAGERY FOR SPORT

In some way, every imagery approach enhances sensory richness through cognitive and motivational factors that adheres to Paivio's (1985) suggestions. Paivio's framework (further developed by Hall et al., 1998) separates imagery factors further into five distinct types; cognitive specific (skill development), cognitive general (CG: technical and tactical strategies, game plans, or routines), motivation specific (MS: goal achievement), motivational general-arousal (MG-A: emotional awareness), and motivation general-mastery (MG-M: self-control, confident and mentally tough). Imagery approaches, for example PETTLEP and LSRT, fulfil all five distinct imagery functions whilst increasing vividness and controllability, through conversations with the practitioner stimulating task and imagery learning (cf. Lang, 1979). However, not all of Paivio's motivational factors are equally vital for optimising performance (Spindler et al., 2019).

Motivation general and specific imagery in the context of Hall et al. (1998) and subsequent approaches (i.e., PETTLEP), focus on directed tasks such as penalty kick success (Ramsey et al., 2010), which do not examine the individual's intrinsic motivation through values, beliefs and purpose. Motivational imagery in this setting is task specific and thus contains a mixture of intrinsic and extrinsic factors (Simonsmeier et al., 2020), such as general performance (scoring) and process goals (learning to place the ball in a specific area, and/or emotional control) but does not explore motivation prior to and beyond the task, such as beliefs, meaning and purpose. Arguably, the MS factor should be separated further into micro-imagery (task) and macro-imagery (long-term purposeful goal) to evoke a deeper level of focus through meaning and purpose. By exploring motivation through meaning (e.g., how is this task important for my current development?) and purpose (e.g., how does this task have future benefit for myself and others?), the imagery intervention may go

IMAGERY FOR SPORT

further than a single performance manipulation to a possible way to change behaviour that lasts beyond the task.

Functional Imagery Training

Functional Imagery Training (FIT; Solbrig et al., 2018; Rhodes et al., 2018, 2020, 2021) trains effective use of self-elicited, personal motivational imagery, building motivation and self-efficacy to successfully work towards and to achieve intermediate and long-term goals. Detailed interviewing techniques aim to evoke change by first examining values, beliefs and experiences verbally, and then by imagining the key outcomes of this process. The verbal FIT interview sections are based on the fundamentals and ‘spirit’ of motivational interviewing (MI; cf. Miller & Rollnick, 2012); a non-judgemental person-centred, but directive approach for behaviour change. FIT goes further than MI and integrates imagery through these discussions focused on intrinsic motivation and future purpose. Furthermore, FIT explores challenges and setbacks with the aim of overcoming ambivalence and/or immediate and future obstacles, redirecting imagery towards MS (Paivio, 1985) desired outcomes. In a randomised controlled trial directly comparing FIT and MIs’ effectiveness in weight-loss, (Solbrig et al., 2018), participants in the FIT condition lost five times more weight than the MI condition during the trial and went on to lose weight a year post intervention. Solbrig et al. (2018) implemented cues, daily activities such as when boiling a kettle, to retrain negative thoughts that could compromise healthy behaviours, using imagery to focus on future success emotionally underpinned by motivation.

In sport, the same FIT methodology has been implemented for soccer players (Rhodes et al., 2018), using cues which triggers imagery (e.g., lacing up boots), to enhance imagery frequency resulting in athletes enhancing their level of grit,

IMAGERY FOR SPORT

perceiving imagery enhanced performance. Further, to assess performance, Rhodes et al. (2020) investigated penalty kick success by asking professional soccer players to take penalties at baseline, and then randomly separated into one of three groups: FIT with practice, PETTLEP with practice, and a practice control who discussed existing mental skills strategies, who were all supported for only one week. At the end of one week, and again after 15 weeks, participants completed a series of penalty kicks to assess changes from baseline. The findings showed that at week one both the FIT and PETTLEP groups significantly improved whilst there was no change in the control. Furthermore, beyond week 15, all participants returned to show no differences at baseline except the FIT group who maintained improvements made from week one.

FIT is based on the Elaboration Intrusion theory (EI theory; Kavanagh et al., 2005) which incorporates the role of desire in boosting motivation for initiating and sustaining behaviour change. According to EI theory, multisensory imagery is a central component of desires, especially when they are intense (May et al., 2015). A craving, or desire, typically begins as a seemingly spontaneous intrusive thought (May et al., 2004), either triggered externally by the environment, or internally, for example by emotional states, such as boredom, or a physiological deficit like hunger (Kavanagh et al., 2005). These initial thoughts can be fleeting, but when the deficit they highlight is perceived as strong, or salient enough, desire cognitions permeate into attention, where they are consciously elaborated. Key to this thought elaboration is multisensory mental imagery of attainment and consumption of the craved consumable substance and the immediate reward or pleasure it brings (May et al., 2015). This imagined attainment and consumption is pleasurable at first. If the craving cannot be satisfied, the accompanying imagery provides a vivid comparison between our current state and the desired state, highlighting the discrepancy and making us

IMAGERY FOR SPORT

increasingly aware of it. In this case, the craving becomes aversive (Kavanagh et al., 2005).

According to EI theory, functional desires should operate in a similar way to unwanted cravings. This hypothesis is supported by findings that imagery not only features in cravings for substances like alcohol or chocolate (Kavanagh et al., 2004; May et al., 2014), but it is also present in desires for healthy goals, such as playing hockey (May et al., 2008), alcohol reduction (Robinson et al., 2016), diabetes self-management (Parham et al., 2018), and pro-environmental behaviours (Boomsma et al., 2016). Practising and strengthening imagery is therefore predicted to increase motivation and there is good evidence to support this prediction in relation to motivation for physical activity (Giacobbi et al., 2014).

Knowing that intrusive thoughts when elaborated upon can result in a drop or improvement in motivation, the FIT approach offers the individual the tools to control their imagery and restructure thinking, providing a choice in cognitions. Athletes report spontaneous negative imagery which may affect their performance (Williams & Cumming, 2016), so having a technique that can improve motivation and goal commitment is vital, especially when undertaking challenging tasks that may create unwanted self-talk or imagery, like when attempting an ultra-marathon (Rhodes et al., 2021).

According to Baddeley and Hitch's (2001) Working Memory Model, a stimulus or thought is given attention and when elaborated upon evokes visual imagery (visuo-spatial sketchpad) also activating self-talk as cognitions are rehearsed (phonological loop) and a specific event recalled (episodic buffer). The depth of the experienced thought; multi-sensory elaboration paired with self-talk, often influences the resultant behaviour. Therefore, if an intrusive, unproductive and unwanted thought

IMAGERY FOR SPORT

that is not aligned to our goals is elaborated upon, it can lead to a negative behaviour, such as underperformance in sport or avoidance. However, if at the point of elaboration, a dual thought is activated which is a constructive, positive and a wanted thought, the individual has the potential to elaborate on that individual thought instead. As only one thought can be elaborated upon at once (Baddeley & Hitch, 2001), if a new thought enters consciousness it will compete with the current working memory thought, and thus elaboration begins. At this point there is potential for a proactive target behaviour to be elicited (May et al., 2004; Kavanagh et al., 2005). Importantly, FIT activates the positive target thought (often the emotion associated with achieving a long-term purposeful goal) periodically during the day through cues which activates imagery and leads to multi-sensory elaboration. This is only achieved by exploring values, beliefs, emotion and the processes of change that can support motivation towards goal success, which is verbalised by the participant, not directed by the practitioner.

Goal Motivation

According to goal motivation theorists (Kruglanski et al., 2002) goals are often organized in a hierarchical manner with smaller lower-order goals cascading from one overarching long-term goal. Therefore, there will often be several lower-order goals that support (and lead to) one higher-order outcome. A setback towards a lower-order goal would be faced with either the individual giving up, thus affecting the higher-order goal, or persevering by adapting a new approach to the task. Using FIT, we see the higher-order goal as the individual's life purpose, such as inspiring their grandchildren, then explore the lower order goals which adds meaning to the process. Acknowledging that when working on long-term purposeful goals, individuals may struggle to use imagery for an abstract target thought, booster

IMAGERY FOR SPORT

sessions, generally fifteen minutes long (Turner et al., 2020), provide imagery support which enhances goal motivation during challenging tasks and promotes mental skill mastery (Rhodes et al., 2021). Sustained behaviour change towards, for example, a healthy lifestyle is a process of self-discovery through a series of supported changes and engaging in tasks that have tangible outcomes. By teaching individuals to learn and apply imagery methods effectively, motivation is harnessed by contrasting between current and future self. Carver and Scheier (2000) hypothesize that any shift in a long-term goal directly impacts ideal self and results in a personal self-reflected recalibration. This recalibration has a functional influence upon how goals are set as it shuffles personal objectives and motivations.

The usefulness of goal setting is entirely dependent on what goals are set, especially the difficulty, duration, importance, and specificity of goals (Swann et al., 2020). Even the time of the sporting season can have an impact on the athlete's motivation and effort (Holliday et al., 2008), so goal setting should be structurally and systematically planned. What is agreed upon is that learning goals are best suited to enhance sports performance. Hardy and Jones (1994) proposed process (e.g., staying relaxed), outcome (e.g., finishing the season placed in the top three) and performance goals (e.g., achieving a personal best time). While all goal types are important (see Filby, Maynard, & Graydon, 1999), motivational goal imagery expands on how goals are given attention and elaboration by exploring comparisons between current skill and future potential. Therefore, outcome goals are broken down by planning ways to systematically work towards medium term imagined targets, which we name meso-imagery.

Goal focused motivational meso-imagery, developed from MS imagery has been used in many settings and in a variety of ways through scripts (Smith et al.,

IMAGERY FOR SPORT

2001) to general imagery delivery through sequences. Oettingen (2012), used the acronym WOOP to cover four MS imagery sequences: wish, outcome, obstacle, and plan. Based on the premise of mental contrasting, individuals set challenging goals (wish); visualise the goal and how it will feel when successful (outcome); locate personal factors that will prevent achievement, such as poor time management (obstacle); then set out a timely realistic schedule (plan). Importantly, this process of mental contrasting creates an autonomous process centred on implementation intentions. WOOP goals, therefore, follows a methodical process for practitioners and participants to follow, based on locating a future-self and identifying personal weaknesses. In a randomised comparison study (Saddawi-Konefka et al., 2017) involving anaesthesiology residents who were studying for an exam, a standardised self-directed goal setting group were compared to a WOOP goal setting group. Findings showed that WOOP goal setting increased the hours studying in comparison to the standard group. However, in that study there were no formal imagery training methodologies that aimed to enhance vividness and controllability, students used existing methods to mentally contrast and plan.

Imagery, specifically the FIT approach: MI plus imagery training, is reliant on amalgamating cognitive and person-centred psychology to focus on specific goals and realign thinking by adapting behavioural cues. Paivio's (1985) model forms the basis for imagery considerations, and FIT goes further by merging mental contrasting (Oettingen (2012) with differing motivational goals that aim to recalibrate imagery sometimes due to intrusive thoughts. Athletes often report intrusive negative imagery which may affect their performance (Williams & Cumming, 2016). AIM is a person centred model that shifts unwanted thinking towards performance consistency,

IMAGERY FOR SPORT

resulting in the athlete having a methodology to reset thinking based on activating motivational goal imagery.

Position Statement

We recognise the potential benefits and drawbacks when using imagery. It can enhance skills, manage emotions, and increase performance (Weinberg & Gould, 2018; Rhodes et al., 2020), but on the flip side can evoke unwanted images of injury, setbacks and fear (Ievleva & Orlick, 1999; Hsu et al., 2017). Through systematic processes, negative imagery has the potential to be managed, and a sense of self-control and self-efficacy improved.

Many sport psychologists use PETTLEP with self-reflection tasks (e.g., Pocock et al., 2019) to improve performance and control emotions. These self-reflection tasks, as well as initial (and ongoing) discussions increase imagery ability and frequency, linking imagery with neural activity, known as functional equivalence. Functional equivalence has been historically empirically investigated through brain scans (Jeannerod, 1994; Jeannerod & Decety, 1995) with recent studies coming to similar conclusions (Ibáñez-Marcelo et al., 2019); that imagined tasks activate corresponding brain regions identical to when performing the task itself. Therefore, progress made using formal imagery training is clearly evident, so our aim is to add value using motivational imagery to prolong progressions made through short-term interventions.

The approach uses MI (Rollnick et al., 2019) paired with imagery as a compound mental skill through multisensory exposure and utilises factors such as self-talk, mindfulness, goal setting, and feedback to direct effort and motivation. These psychological skills and strategies add to the overall application and improvement of imagery. Therefore, by controlling imagery, participants report that

IMAGERY FOR SPORT

they can realign their self-talk from negative to positive (Rhodes et al., 2021), and likewise, learning to focus on positive personal affirmations can add to the vividness of images. We have adapted our motivational methods from Rogers (1942, 1951, 1980) person-centred counselling, MI, and FIT, for interdisciplinary practitioners who support athletes, to use as a template for imagery deployment. The approach is not restricted by timeframes due to the exploration of personal goals, and the depth required to explore intrinsic factors whilst the individual learns to refine imagery skills. However, rough guidance on timescales is provided for each element of the model. The AIM model has been developed for practitioners as a structured process that follows imagery stages and levels of goals with the intention to enhance motivation, long-term behavioural change and promote performance consistency.

The AIM Model

AIM is person-centred imagery, integrating motivational goals in a linear (non-scripted) sequence with the intention to add sensory richness, lucidity and the sharpness of an image. Initial research specifically using AIM has shown sustained performance increments in soccer (Rhodes et al., 2020) and when undertaking an ultra-marathon (Rhodes et al., 2021). AIM starts with an initial motivational interview (lasting roughly for one hour) which leads into three overarching stages of imagery (see Figure 1) that flow through four specific levels of motivation for goals. Each of the three imagery stages are associated with MI principles, so as practitioners we should: fully engage the athlete in a learning process to master technical/tactical skills and imagery application; give athletes choices and support progressions however small; and examine values and beliefs that form connections to their sporting community. The end result is an imagery process which is implemented by the athlete daily through a sequence of self-activated cues.

Insert Figure 1 about here

The AIM approach uses imagery as a hierarchical process, similar to that of goals (Kruglanski et al., 2002) and thus explore each level using imagery. After an initial MI constructed interview, imagery is formally introduced by exploring the four goal levels through three multisensory stages lasting roughly one hour per stage. During each of the three imagery stages, detail is cultivated through training the individual to vividly examine the scene and change elements as necessary. Macro-imagery (like MS imagery and outcome goals; Hall et al., 1998; Filby et al., 1999) is primarily a singular long-term goal and ‘the big-picture’ purpose (e.g., to win an Olympic gold medal because it will inspire others), whereas meso-imagery is the process of mentally contrasting (Oettingen et al., 2001) current self (e.g., current skill mentally compared to desired skill) with future task performance.

Micro-imagery is the final stage in which an immediate process goal (see Filby et al., 1999) is planned and shaped using imagery for instant action with the aim to refine current performance. The resultant behaviour is implemented through a cue that is specific to the athlete (e.g., spinning a tennis racket), and the athlete is trained to revisit the sequence after they utilise their cue through the acronym LAP; locate cue, activate imagery, perform (Rhodes et al., 2020). Through repeating the goal sequence, LAP realigns thought elaboration (EI theory) and can be applied to a series of settings to impede intrusive negative images. The cue, once imagery is taught, is the activating event that starts the chain reaction of imagery deployment. Therefore, AIM is the sequence for the practitioner to teach imagery and develop motivation, and LAP is the eventual quick (<30 seconds) application of the athlete.

Motivational Interview

At all times, the spirit and processes of MI are followed (Rollnick et al., 2019). The initial procedure of the interview is used to develop a connection with the athlete and gain an understanding of their background whilst (process one of MI) engaging in conversation (Rollnick & Miller, 2012). Life story interviews (cf. Atkinson, 1998; King et al., 2018) are a method that can be underpinned through research, and as a way for the athlete to unearth profound meaning and examine motivation from all areas of life. Therefore, the first step is to engage the athlete in conversation. This method puts the athlete in control, with the practitioner learning from the athlete. At critical points during the conversation, the practitioner uses their series of MI skills, such as affirmations, reflections and summaries, to explore the athletes' values, beliefs and experiences, which focus on the origin of motivation and rationale for selecting a long-term goal and personal purpose. While a long-term goal may be to win an Olympic medal, the purpose is beyond the goal and is often connected to community or global progress such as increasing sporting participation (see Ratner et al., 2019). Therefore, using the MI process, the aim of the motivational interview when using AIM is to engage in conversation and focus (process two of MI) on a specific personal long-term goal that has the potential to benefit others. In this period there is no formal imagery training, as this is an opportunity for the practitioner to learn and develop rapport and for the athlete to share goals, which leads to connectedness and empathy.

It is likely that with probing questions, athletes will discuss their motivation, confidence, anxiety, skills, role clarity, personal/team performance, etc, as the life story progresses (Douglas & Carless, 2009). At these critical points, practitioners should explore what existing mental skills/strategies the athlete uses, such as imagery

IMAGERY FOR SPORT

or breathing techniques that they employ to manage their emotions and remain focused. Being person-centred, is not predicting what a person will say, but having the skills to support development if the athlete so wishes. At these points, when mental skills are discussed, athletes are asked if they use visualisation or imagery. In our experience, individuals then give examples of imagery use which we ask their permission to measure and if they would like to refine their existing method. For those who do not use imagery and do not list examples, there is further review about how athletes perceive and plan for performance. Ely et al. (2020) suggest that applied practitioners should identify athletes existing mental skills and consider ways to weave skills together, including assessing individuals' imagery ability.

To measure imagery in adults, we primarily suggest using two imagery scales, one for sensory exploration (The Plymouth Sensory Imagery Questionnaire (Psi-Q); Andrade et al., 2014) and one for sporting ability (The Sport Imagery Ability Questionnaire (SIAQ); Williams & Cumming, 2011). These scales are recommended to locate current ability and to focus attention on specific sensory strengths and areas of improvement. As motivation is examined during the interview a further scale could be added in latter stages of AIM to assess motivation, such as the Motivational Imagery Ability Measure for Sport (MIAMS; Gregg & Hall, 2006), which would form the basis for discussion about how, for example, athletes use MG-A imagery. Questionnaires are seen to be reductionist and often not advisable when using a person-centred approach, however, the questionnaires are used for learning more so than to track change. The Psi-Q locates the individual's sensory sensitivity, whilst the SAIQ is specific to a series of sporting factors such as tactical strategies, technical skills and emotions. These measures become the baseline scores that indicate how the individual is using cognitive methods and is a way for practitioners to check progress

IMAGERY FOR SPORT

when working specifically to train a sense, such as auditory imagery. Furthermore, when the target goal is to refine a sports specific skill, such as the precision of the ball in an opponent's box during a tennis serve, performance feedback can be tracked based on goal achievement (Martin et al. , 1999). As a note of interest, if individuals score zero throughout, they may have aphantasia (cf. Dawes et al., 2020). More likely, it is common for athletes to achieve low scores on specific senses (Hall et al., 1998), such as olfactory imagery, which is a factor of individual sensitivity that is expected to change due to training.

Macro-imagery

At this point, the personal long-term goal and its connected purpose (including the rationale for goal selection) has been discussed. It must be apparent at the point of entering the macro-imagery stage what the long-term goal is, and why it is important to be pursued. This emotional foundation for behavioural perseverance (Duckworth & Quinn, 2009) is key to experiencing imagery and for focusing on goals (process two of MI; Miller & Rollnick, 2012). Athletes report imagining success from a young age (Bloom & Sosniak, 1985) and continue to set challenging goals in pursuit of excellence throughout their careers as they develop purpose and meaning (Ratner et al., 2019). By setting clear goals and formulating role clarity, elite athletes become ruthless and disciplined in goal pursuit (Hardy et al., 2017), enhancing passionate obsession which boosts motivation. Furthermore, narrative analyses on world-class athletes have shown that this process of long-term goal setting coupled with connections with others builds social and personal identity (Morgan et al., 2015). Where possible we support harmonious passion through supporting intrinsic motivation (see Vallerand et al., 2003), but accept that there will be times when motivational imagery is an extrinsic emotive obsession to learn and achieve.

IMAGERY FOR SPORT

To direct motivational imagery, LSRT (Williams et al., 2013) is a method used to train imagery by increasing vividness and controllability by adding senses periodically to develop the detail of elaboration. To achieve this in macro-imagery, individuals are asked to examine the long-term goal (stimulus) with layers (e.g., senses and scenarios) added to emphasise meaning (Cumming & Williams, 2013). For example, if the long-term goal is to win an Olympic medal because it will inspire others, stimulus propositions would first include the location, hearing the crowd and/or national anthem, focus on teammates and support team, and the temperature and weather (Nordin & Cumming, 2008). AIM goes further than LSRT by exploring the purpose of the goal: how do you see your goal benefitting others? This fantasised scenario is then elaborated upon through sensory layering. In each case, when providing a detailed image, a response proposition is generated, such as a change in heart rate, muscular tension, and linked with emotions. With each additional layer, as the image is produced, the participant reflects on the experience of achieving their higher connected purpose, and verbally describes the content, and importantly its meaning (Cumming & Williams, 2013).

The process of the long-term goal, having a connected purpose, and other future events are discussed, and a future-self reflected. The future-self is centred upon specific events and idealised ability. These fantasised events lead up to long-term goal accomplishment and, although realistic predictions should be encouraged, participants are permitted to use imagery to imagine outcomes (see Oettingen et al., 2001). For example, to qualify for the Olympic Games athletes may discuss competing in a world-cup event, how they perform, and where they place. This prediction is affirmed by the practitioner and discussed using LSRT to support self-efficacy.

IMAGERY FOR SPORT

Meso-imagery

Stage two, meso-imagery, is used to evoke motivation (process three of MI; Miller & Rollnick, 2012) towards the long-term goal through mental contrasting between future and current self, including outcomes if the goal is achieved (positive imagery) and not (negative imagery). The process of mental contrasting has been developed from Oettingen et al. (2009), which aims to reinforce commitment to change. To achieve this, athletes are asked to list existing struggles or areas in need of development. This should be skill and/or emotion based (Ramsey et al., 2010). Examples of technical struggles could be learning to refine a pass in soccer or knee position when sprinting, and emotion based may be to manage anxiety or confidence when under pressure. Once these personal struggles are expressed, athletes initially discuss future events whereby nothing has changed. Again, these events are explored through LSRT resulting in negative future imagery. Athletes may discuss how disappointed in themselves they would feel if they made no progress, remaining, for example, anxious when under pressure. Research (Renner et al., 2019; Solbrig et al., 2018) has shown that negative imagery can be used as a motivational amplifier when compared to imagining positive outcomes, such as goal achievement.

The mental contrasting protocol (see Saddawi-Konefka et al., 2017) is reflected through positive imagery, whereby individuals consider how their current self would need to adapt when an obstacle arises, and how overcoming the obstacle will support goal achievement. This process of verbalising change develops solutions which intrinsically unfolds. For example an athlete may consider improvements in technique can be achieved when they manage emotions. Once negative and positive imagery has been effectively deployed, we have found (Rhodes et al., 2018, 2020) that athletes produce a series of solutions such as scanning the field of play before

IMAGERY FOR SPORT

potentially receiving a pass to better manage pressure. Potential imagined solutions to struggles and areas of development are mutually discussed in vivid detail with the practitioner asking probing questions, such as “how can the skill be further refined?”, which varies the complexity of the athletes imagined experience (Murphy et al., 2008). Once the solution/area for improvement is exhausted by the athlete, each solution is rated on the importance to change (Rollnick et al., 2019) from 0 (not important) to 10 (extremely important). All scores are discussed to rationalise responses and the scores with the highest ratings lead onto immediate process goals.

Micro-Imagery

The final imagery stage is to consider the current self and set an immediate goal. Imagery in this stage is an amalgamation of performance profiling (Butler & Hardy, 1992; for a review see, Weston et al., 2013) and task focused imagery like PETTLEP. While PETTLEP requires the individual to experience each of the seven components in a directive manner, micro-imagery’s focus is on perceptions of current self and an immediate self-administered goal. PETTLEP research (e.g., Ramsey et al., 2010) is often prescriptively administered (the practitioner directs the task), whereas micro-imagery is organic meaning that the athletes select their goal based on improving performance profile scores. During this stage, goals shift from outcome to process, which has been shown to enhance performance (Zimmerman & Kitsantas, 1997). To illustrate, in soccer, an athlete’s current self-administered immediate goal, based on their importance rating from the performance profile, may be to improve cross accuracy. The athlete then leads the experience by verbalising the imagined task, with the practitioner prompting multisensory imagery when necessary. The athlete may say: “I can feel the soft grass, moving down the wing, looking up before the ball is crossed and how my weight is distributed, the feel of the ball as it makes

IMAGERY FOR SPORT

contact with my foot, the sound it makes, the curve of the ball as it flies through the air, the header of the attacker as they place it in the goal". The emotive outcome; the feelings of success based on the process is then reflected. After athletes are trained through this procedure, feedback from imagery experience is then measured by asking athletes to rate their confidence to complete independent practice that focuses on the process goal, from 0 (not confident) to 10 (extremely confident), and similar to when measuring importance, all scores are discussed.

The process of using micro-imagery is the end of formal motivational imagery training as it develops a plan of action (process four of MI; Miller & Rollnick, 2012). As with many other imagery training approaches, the next phase is to implement changes through specific tasks (Oettingen et al., 2015). In the case of AIM, athletes decide on their motivational cue which will act as a trigger to activate imagery.

Cues and LAP (Locate cue, Activate imagery, Perform)

Through the four multisensory imagery stages, motivation should be explored across all four goal levels to evoke motivation. If athletes are confident to try independent practice, behavioural cues are then introduced. We have two rationales for using cues. Initially, cues are a method of increasing imagery frequency (Wakefield & Smith, 2009) and associated confidence using mental skills. Secondly, cues commence the formal act of deliberate imagery use with the aim to restructure cognitions and behavioural adaptations (Vealey & Greenleaf, 2006). Cues are selected by athletes which are everyday tasks, such as filling up a water bottle (Rhodes et al., 2018). The acronym LAP, developed through experimental research by Rhodes et al. (2018, 2020, 2021) and is the sequence for applied imagery application which starts implementation intentions. Upon (L) locating the cue, athletes are asked to (A) activate their imagery which follows the same AIM stage cycle; multisensory long-

IMAGERY FOR SPORT

term goal imagery including purpose, mental contrasting of future and current self, and immediate process goal. Finally, the athlete performs (P) by committing to a specific action that is immediately implemented (Knäuper et al., 2009). The athlete is given time to practice LAP with the practitioner during the session by imaging the implementation intention; performing the cue and then verbalising the learning process if needed (Lang, 1985). The athlete is then measured on readiness to independently use imagery on a daily basis from 0 (not ready) to 10 (ready to start immediately), and scores discussed.

Recent research (Rhodes et al., 2021) has found that participants who used LAP to run an ultra-marathon were five times more likely to finish compared to participants who did not. Participants used personally refined self-talk, breathing techniques, and race targets as their cue, reporting an improvement in managing “internal chatter by activating imagery at critical times” helping participants to “focus on success when fatigue and unwanted thoughts tried to take over” (Rhodes et al., 2021, p. 4). Cues can be modified based on the task showing flexibility and adaptive learning from the initial cue, which triggers different imagery for other challenging tasks. Quick 15 minute booster sessions are offered at the discretion of the athlete (often monthly), in which LAP is reviewed, and strategies refined, supporting self-efficacy. During these sessions athletes are asked to modify cues once they are comfortable using imagery outside of originally discussed tasks, then refine cues during sports performance. This adaptation process from formal imagery use during practice, to applied performance imagery (Cumming & Williams, 2013), enables the athlete to learn to locate performance cues and control thinking. For example, tennis players could have started using a drink bottle as a cue that activated imagery before a task. Players could then adapt their cue during performance scenarios, often noticing

IMAGERY FOR SPORT

that they slap their leg after poor technical execution culminating into negative self-talk. This has the potential to produce negative imagery and behaviour, which if left to manifest could exacerbate into diminished performance. This negative cue (e.g., leg slap), becomes the cue to activate imagery through focusing on; the long-term goal meaning (brief ≈ 5 seconds), mental comparison (≈ 5 seconds), and an immediate controllable process goal (≈ 5 seconds). Once the process goal is selected and imagined we recommend the athlete commits to the action, ending the routine with a trigger behaviour such as a spin of the tennis racket. If the athlete does not reach a specific committed process goal, and micro-imagery is not activated, we recommend a single centring breath which is effective in applied situations (Orlick, 2015), which can decrease stress and allow for imagery to be activated.

Naturally, positive cues may be used, such as positive self-talk (Van Raalte et al., 2016), breathing techniques (Pineschi & Di Pietro, 2013), energizing music (Karageorghis & Terry, 2012), etc, which adds value to personal refinement of the AIM model. The LAP process focuses attention through personal cues with the potential to thwart the cycle of negative intrusive thought rehearsal and elaboration (Andrade et al., 2012; Kavanagh et al., 2005). The LAP process is how the athlete/user applies AIM as it gives cues a routine to activate imagery, operating as a compound mental skill which integrates other tailored strategies.

Overview and Outcomes

AIM is a practical guide that links motivational and cognitive theories through a progressive applied model focused on self-directed unique goals. Functionally, the practitioner supports motivation when using AIM, then transfers ownership of its application to the athlete who uses LAP. To achieve this, motivation is evoked through conversations and collaborative discovery by training positive multisensory

IMAGERY FOR SPORT

imagery activated through cues, followed by implementation intentions. For behaviour to be changed and sustained, individuals must recognise their own responsibility for actions and goals. This intrinsic responsibility is amplified by the practitioner who supports self-efficacy even if the learning and change is small, recognising that every action indicates positive progress.

The purpose of AIM is for the practitioner to have a replicable model that is effective when working with athletes. However, there must be flexibility when delivering person-centred approaches due to imagery ability, goals, and the direction that conversations take.

Our role as psychologists or practitioners who use AIM is not to enhance performance, purely support imagery application and motivation through neutrality (Miller & Rollnick, 2012), which should lead to technical and tactical development (including creativity and self-evaluations), and psychological management (e.g., self-confidence and emotions). For the athlete, the main initial outcome is to apply LAP. By applying bespoke imagery, the consequential outcome is to maintain short-term performance increments over a longer period of time. In partnership, imagery is then refined from the training ground to competition, as the practitioner and athlete learn unique methods that work best, adding additional mental skills to activate imagery, such as positive self-talk, which then activates imagery.

Conclusion and Future Directions

Clearly, many psychologists (coaches, physiotherapists, counsellors, etc) are using a variety of imagery models and mental skill approaches (Simonsmeier et al., 2020), but these are often a minimal criterion for deployment and may not be delivered as a compound mental skill for long-term acquisition. The AIM model builds on other applied imagery approaches using a structured guide that integrates

IMAGERY FOR SPORT

cues to elaborate on desired outcomes leading towards proactive behaviours. To reach this point the athlete's motivation must be fully explored, goals and purpose discussed, imagery trained and refined, and athletes supported when learning to adapt mental skills based on their sport and individual requirements/application. On the one hand, we anticipate this model being used as a strategy, in conjunction with coaches who train athletes to manage emotions and actions during high pressure situations (Stoker et al., 2016), and on the other hand recognise the complexity of individual imagery training which should ideally be conducted by specialist psychologists/practitioners.

In partnership with several institutions, there are ongoing FIT projects working in and outside sport (e.g., Shuai et al., 2021), in domains such as health, education, business and the military, collectively using FIT and the AIM model with the focus on positive sustained behaviour change. Furthermore, the FIT programme is continuing to develop resources (similar to that of MI) to support the training of practitioners from a wide variety of applied settings, ensuring high fidelity levels through industry, including offering free training for early career researchers where possible. As imagery is personal, individuals (and practitioners) will be at different levels of ability (Hall et al., 1998), which creates discussion through diversity. This discussion is important as models of imagery use are steeped in research but must be straightforward for the athlete/participant to apply.

The AIM model has been primarily designed for professional sport using feedback from psychologists, coaches and importantly athletes. However, future research using AIM in youth sport would be of significant benefit, but there are obstacles as individuals may struggle to recognise, verbalise, and imagine their higher purpose at a young age. Mental skills programmes must become a priority in youth

IMAGERY FOR SPORT

sport, and AIM would be suitable if there is sufficient time to connect and discuss goals with young athletes, as it focuses on intrinsic motivation and task mastery, and can be utilised in other areas of an athlete's life such as with school work.

Furthermore, longitudinal studies operating over multiple seasons will give a better indication of lasting effects and the benefits of periodic boosters, including optimal delivery frequency. Further research will enhance the application and understanding of AIM with the ultimate realistic objective of better cognitive and behavioural control through self-administered and refined imagery that supports physical and psychological mastery.

References

- Andrade, J., Khalil, M., Dickson, J., May, J., & Kavanagh, D. J. (2016). Functional Imagery Training to reduce snacking: Testing a novel motivational intervention based on Elaborated Intrusion theory. *Appetite, 100*, 256-262.
- Andrade, J., May, J., Deepröse, C., Baugh, S. J., & Ganis, G. (2014). Assessing vividness of mental imagery: the plymouth sensory imagery questionnaire. *British Journal of Psychology, 105*(4), 547-563.
- Andrade, J., May, J., & Kavanagh, D. (2012). Sensory imagery in craving: From cognitive psychology to new treatments for addiction. *Journal of Experimental Psychopathology, 3*(2), 127-145.
- Andrade, J., May, J., van Dillen, L., & Kavanagh, D. J. (2015). Elaborated intrusion theory: Explaining the cognitive and motivational basis of desire. In W. Hoffman & L. F. Nordren (Eds.), *The psychology of Desire* (pp. 17-35). NY: Guilford.
- Anuar, N., Williams, S. E., & Cumming, J. (2018). Comparing PETTLEP imagery against observation imagery on vividness and ease of movement imagery. *International Journal of Sport and Exercise Psychology, 16*(2), 150-163.
- Atkinson, R. (1998). *The Life Story Interview*. Thousand Oaks, CA: Sage.
- Baddeley, A. D., & Andrade, J. (2000). Working memory and the vividness of imagery. *Journal of Experimental Psychology: General, 129*(1), 126.
- Baddeley, A. D., & Hitch, G. (2001). *Working memory in perspective*. Psychology Press.
- Bloom, B. S., & Sosniak, L. A. (1985). *Developing talent in young people*. Ballantine Books.
- Boomsma, C., Pahl, S., & Andrade, J. (2016). Imagining change: An integrative approach toward explaining the motivational role of mental imagery in pro-environmental behavior. *Frontiers in Psychology, 7*, 1780.
- Butler, R. J., & Hardy, L. (1992). The performance profile: Theory and application. *The Sport Psychologist, 6*(3), 253-264.
- Carver, C. S., & Scheier, M. F. (2000). Scaling back goals and recalibration of the affect system are processes in normal adaptive self-regulation: understanding 'response shift' phenomena. *Social science & medicine, 50*(12), 1715-1722.

IMAGERY FOR SPORT

- Cumming, J., & Williams, S. E. (2013). Introducing the revised applied model of deliberate imagery use for sport, dance, exercise, and rehabilitation. *Movement & Sport Sciences-Science & Motricité*, (82), 69-81.
- Dawes, A. J., Keogh, R., Andrillon, T., & Pearson, J. (2020). A cognitive profile of multi-sensory imagery, memory and dreaming in aphantasia. *Scientific reports*, 10(1), 1-10.
- Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne*, 49(3), 182.
- Douglas, K., & Carless, D. (2009). Abandoning the performance narrative: Two women's stories of transition from professional sport. *Journal of Applied Sport Psychology*, 21(2), 213-230.
- Duckworth, A. L., Kirby, T. A., Gollwitzer, A., & Oettingen, G. (2013). From fantasy to action: Mental contrasting with implementation intentions (MCII) improves academic performance in children. *Social Psychological and Personality Science*, 4(6), 745-753.
- Duckworth, A. L., & Quinn, P. D. (2009). Development and validation of the Short Grit Scale (GRIT-S). *Journal of Personality Assessment*, 91(2), 166-174.
- Ely, F., Munroe-Chandler, K., O, J. & McCullagh, P. (2020). The practice of imagery: a review of 25 Years of applied sport imagery recommendations: Journal of Imagery Research in Sport and Physical Activity. *Journal of Imagery Research in Sport and Physical Activity*, 15(1), 20200018
- Filby, W. C., Maynard, I. W., & Graydon, J. K. (1999). The effect of multiple-goal strategies on performance outcomes in training and competition. *Journal of Applied Sport Psychology*, 11(2), 230-246.
- Giacobbi Jr, P., Dreisbach, K. A., Thurlow, N. M., Anand, P., & Garcia, F. (2014). Mental imagery increases self-determined motivation to exercise with university enrolled women: A randomized controlled trial using a peer-based intervention. *Psychology of Sport and Exercise*, 15(4), 374-381.
- Gregg, M., & Hall, C. (2006). Measurement of motivational imagery abilities in sport. *Journal of Sports Sciences*, 24(9), 961-971.
- Hall, C. R., Mack, D. E., Paivio, A., & Hausenblas, H. A. (1998). Imagery use by athletes: development of the Sport Imagery Questionnaire. *International Journal of Sport Psychology*.

IMAGERY FOR SPORT

- Hardcastle, S. J., Fortier, M., Blake, N., & Hagger, M. S. (2017). Identifying content-based and relational techniques to change behaviour in motivational interviewing. *Health Psychology Review, 11*(1), 1-16.
- Hardy, L., Barlow, M., Evans, L., Rees, T., Woodman, T., & Warr, C. (2017). Great British medalists: Psychosocial biographies of super-elite and elite athletes from Olympic sports. In *Progress in Brain Research* (Vol. 232, pp. 1-119). Elsevier.
- Hardy, L., & Jones, G. (1994). Current issues and future directions for performance-related research in sport psychology. *Journal of Sports Sciences, 12*(1), 61-92.
- Holliday, B., Burton, D., Sun, G., Hammermeister, J., Naylor, S., & Freigang, D. (2008). Building the better mental training mousetrap: Is periodization a more systematic approach to promoting performance excellence?. *Journal of Applied Sport Psychology, 20*(2), 199-219.
- Holmes, P. S., & Collins, D. J. (2001). The PETTLEP approach to motor imagery: A functional equivalence model for sport psychologists. *Journal of Applied Sport Psychology, 13*, 60–83.
- Hossini, R. N. S., Afroozeh, M. S., Vaezmosavi, M., Gerber, M., Puehse, U., & Brand, S. (2019). Examining the Effectiveness of a PETTLEP Imagery Intervention on the Football Skill Performance of Novice Athletes. *Journal of Imagery Research in Sport and Physical Activity, 14*(1).
- Hsu, C. J., Meierbachtol, A., George, S. Z., & Chmielewski, T. L. (2017). Fear of reinjury in athletes: implications for rehabilitation. *Sports Health, 9*(2), 162-167.
- Ibáñez-Marcelo, E., Campioni, L., Phinyomark, A., Petri, G., & Santarcangelo, E. L. (2019). Topology highlights mesoscopic functional equivalence between imagery and perception: The case of hypnotizability. *NeuroImage, 200*, 437-449.
- Ievleva, L., & Orlick, T. (1999). Mental paths to enhanced recovery from a sports injury. In D. Pargman (Ed.), *Psychological Bases of Sport Injuries* (pp. 199–220). Morgantown, WV: Fitness Information Technology.
- Jeannerod, M. (1994). The representing brain: Neural correlates of motor intention and imagery. *Behavioral and Brain sciences, 17*(2), 187-202.

IMAGERY FOR SPORT

- Jeannerod, M., & Decety, J. (1995). Mental motor imagery: a window into the representational stages of action. *Current Opinion in Neurobiology*, 5(6), 727-732.
- Karageorghis, C. I., & Terry, P. C. (2012). Chapter 1-The psychological, psychophysical and ergogenic effects of music in sport: A review and synthesis: Chapter taken from *Sporting Sounds* ISBN: 978-0-203-88797-4. *Routledge Online Studies on the Olympic and Paralympic Games*, 1(35), 13-36.
- Kavanagh, D. J., Andrade, J., & May, J. (2005). Imaginary relish and exquisite torture: the elaborated intrusion theory of desire. *Psychological Review*, 112(2), 446.
- Kavanagh, D. J., Andrade, J., & May, J. (2004). Beating the urge: Implications of research into substance-related desires. *Addictive Behaviors*, 29(7), 1359-1372.
- Kavanagh, D. J., May, J., & Andrade, J. (2009). Tests of the elaborated intrusion theory of craving and desire: Features of alcohol craving during treatment for an alcohol disorder. *British Journal of Clinical Psychology*, 48(3), 241-254.
- King, N., Horrocks, C., & Brooks, J. (2018). *Interviews in qualitative research*. SAGE Publications Limited.
- Kingston, K. M., & Hardy, L. (1997). Effects of different types of goals on processes that support performance. *The Sport Psychologist*, 11(3), 277-293.
- Knäuper, B., Roseman, M., Johnson, P. J., & Krantz, L. H. (2009). Using mental imagery to enhance the effectiveness of implementation intentions. *Current Psychology*, 28(3), 181-186.
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W., & Sleeth-Keppler, D. (2002). A theory of goal systems. *Advances in Experimental Social Psychology*, 34.
- Lang, P. J. (1985). Cognition in emotion: Concept and action. In C. Izard, J. Kagan, & R. Zajonc (Eds.), *Emotion, cognitions, and behavior* (pp. 192-226). New York: Cambridge University Press.
- Lang, P. J. (1979). A bio-informational theory of emotional imagery. *Psychophysiology*, 16(6), 495-512.

IMAGERY FOR SPORT

- Markland, D., Ryan, R. M., Tobin, V. J., & Rollnick, S. (2005). Motivational interviewing and self-determination theory. *Journal of Social and Clinical Psychology, 24*(6), 811-831.
- Martin, K. A., Moritz, S. E., & Hall, C. R. (1999). Imagery use in sport: A literature review and applied model. *The Sport Psychologist, 13*(3), 245-268.
- May, J., Andrade, J., Kavanagh, D. J., & Hetherington, M. (2012). Elaborated intrusion theory: a cognitive-emotional theory of food craving. *Current Obesity Reports, 1*(2), 114-121.
- May, J., Andrade, J., Kavanagh, D., & Penfound, L. (2008). Imagery and strength of craving for eating, drinking, and playing sport. *Cognition & Emotion, 22*(4), 633-650.
- May, J., Andrade, J., Panabokke, N., & Kavanagh, D. J. (2004). Images of desire: Cognitive models of craving. *Memory, 12*(4), 447-461.
- May, J., Kavanagh, D. J., & Andrade, J. (2015). The elaborated intrusion theory of desire: a 10-year retrospective and implications for addiction treatments. *Addictive Behaviors, 44*, 29-34.
- Miller, W. R., & Rollnick, S. (2012). *Motivational interviewing: Helping people change*. Guilford press.
- Morgan, P. B., Fletcher, D., & Sarkar, M. (2015). Understanding team resilience in the world's best athletes: A case study of a rugby union World Cup winning team. *Psychology of Sport and Exercise, 16*, 91-100.
- Morris, T., Spittle, M., & Watt, A. P. (2005). *Imagery in Sport*. Human Kinetics.
- Murphy, S., Nordin, S., & Cumming, J. (2008). Imagery in sport, exercise, and dance. In T. S. Horn (Ed.), *Advances in Sport Psychology* (pp. 297–324, 463–467). Human Kinetics.
- Nordin, S. M., & Cumming, J. (2008). Types and functions of athletes' imagery: Testing predictions from the applied model of imagery use by examining effectiveness. *International Journal of Sport and Exercise Psychology, 6*(2), 189-206.
- O, J., Munroe-Chandler, K. J., Hall, C. R., & Hall, N. D. (2014). Using motivational general-mastery imagery to improve the self-efficacy of youth squash players. *Journal of Applied Sport Psychology, 26*(1), 66–81.
- Oettingen, G. (2012). Future thought and behaviour change. *European Review of Social Psychology, 23*(1), 1-63.

IMAGERY FOR SPORT

- Oettingen, G., Kappes, H. B., Guttentag, K. B., & Gollwitzer, P. M. (2015). Self-regulation of time management: Mental contrasting with implementation intentions. *European Journal of Social Psychology, 45*(2), 218-229.
- Oettingen, G., Mayer, D., Sevincer, A. T., Stephens, E. J., Pak, H., & Hagenah, M. (2009). Mental contrasting and goal commitment: The mediating role of energization. *Personality and Social Psychology Bulletin, 35*, 608–622.
- Oettingen, G., Pak, H. J., & Schnetter, K. (2001). Self-regulation of goal-setting: turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology, 80*(5), 736.
- Orlick, T. (2015). *In pursuit of excellence*. Champaign, IL: Human Kinetics.
- Paivio, A. (1985). Cognitive and motivational functions of imagery in human performance. *Canadian Journal of Applied Sport Sciences. Journal Canadien des Sciences Appliquées au Sport, 10*(4), 22S-28S.
- Parham, S. C., Kavanagh, D. J., Shimada, M., May, J., & Andrade, J. (2018). Qualitative analysis of feedback on functional imagery training: A novel motivational intervention for type 2 diabetes. *Psychology & Health, 33*(3), 416-429.
- Pineschi, G., & Di Pietro, A. (2013). Anxiety management through psychophysiological techniques: Relaxation and psyching-up in sport. *Journal of Sport Psychology in Action, 4*(3), 181-190.
- Pocock, C., Dicks, M., Thelwell, R. C., Chapman, M., & Barker, J. B. (2019). Using an imagery intervention to train visual exploratory activity in elite academy football players. *Journal of Applied Sport Psychology, 31*(2), 218-234.
- Ramsey, R., Cumming, J., Edwards, M. G., Williams, S., & Brunning, C. (2010). Examining the emotion aspect of PETTLEP-based imagery with penalty taking in soccer. *Journal of Sport Behavior, 33*(3), 295.
- Ratner, K., Burrow, A. L., Burd, K. A., & Hill, P. L. (2019). On the conflation of purpose and meaning in life: A qualitative study of high school and college student conceptions. *Applied Developmental Science, 1-21*.
- Renner, F., Murphy, F. C., Ji, J. L., Manly, T., & Holmes, E. A. (2019). Mental imagery as a “motivational amplifier” to promote activities. *Behaviour Research and Therapy, 114*, 51-59.

IMAGERY FOR SPORT

- Renner, F., Schwarz, P., Peters, M. L., & Huibers, M. J. (2014). Effects of a best-possible-self mental imagery exercise on mood and dysfunctional attitudes. *Psychiatry Research, 215*(1), 105-110.
- Rhodes, J., May, J., Andrade, J., & Kavanagh, D. (2018). Enhancing grit through functional imagery training in professional soccer. *The Sport Psychologist, 32*(3), 220-225.
- Rhodes, J., May, J., & Booth, A. (2020). Penalty success in professional soccer: a randomised comparison between imagery methodologies. *Journal of Imagery Research in Sport and Physical Activity, 15*(1), 2020-0014.
- Rhodes, J., Nedza, K., May, J., Jenkins, T., & Stone, T. (2021). From couch to ultra marathon: using functional imagery training to enhance motivation. *Journal of Imagery Research in Sport and Physical Activity, 16*(1), 1-7.
- Robinson, N., Kavanagh, D., Connor, J., May, J., & Andrade, J. (2016). Assessment of motivation to control alcohol use: The motivational thought frequency and state motivation scales for alcohol control. *Addictive Behaviors, 59*, 1-6.
- Rogers, C. R. (1980). *A Way of Being*. Boston, MA: Houghton Mifflin.
- Rogers, C. R. (1951). *Client-Centered Therapy*. Boston, MA: Houghton Mifflin.
- Rogers, C. R. (1942). *Counselling and Psychotherapy*. Boston, MA: Houghton Mifflin.
- Rollnick, S., Fader, J., Breckon, J., & Moyers, T. B. (2019). *Coaching Athletes to be Their Best: Motivational Interviewing in Sports*. Guilford Publications.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68.
- Saddawi-Konefka, D., Baker, K., Guarino, A., Burns, S. M., Oettingen, G., Gollwitzer, P. M., & Charnin, J. E. (2017). Changing resident physician studying behaviors: a randomized, comparative effectiveness trial of goal setting versus use of WOOP. *Journal of Graduate Medical Education, 9*(4), 451-457.
- Short, S. E., Tenute, A., & Feltz, D. L. (2005). Imagery use in sport: Mediational effects for efficacy. *Journal of Sports Sciences, 23*(9), 951-960.
- Shuai, R., Bakou, A. E., Andrade, J., Hides, L., & Hogarth, L. (2021). Brief online negative affect focused functional imagery training improves two-week

IMAGERY FOR SPORT

- drinking outcomes in hazardous student drinkers: a pilot randomised controlled trial. *International Journal of Behavioral Medicine*.
- Simonsmeier, B. A., Androniea, M., Buecker, S., & Frank, C. (2020). The effects of imagery interventions in sports: a meta-analysis. *International Review of Sport and Exercise Psychology*, 1-22.
- Smith, D., & Holmes, P. S. (2004). The effect of imagery modality on golf putting performance. *Journal of Sport and Exercise Psychology*, 26(3), 385-395.
- Smith, D., Holmes, P. S., Whitemore, L., & Devonport, T. (2001). The effect of theoretically-based imagery scripts on field hockey performance. *Journal of Sport Behavior*, 24(4), 408-419.
- Smith, D., Wright, C. J., Allsopp, A., & Westhead, H. (2007). It's all in the mind: PETTLEP-based imagery and sports performance. *Journal of Applied Sport Psychology*, 19(1), 80-92.
- Smith, D., Wright, C. J., & Cantwell, C. (2008). Beating the bunker: The effect of PETTLEP imagery on golf bunker shot performance. *Research Quarterly for Exercise and Sport*, 79(3), 385-391.
- Solbrig, L., Whalley, B., Kavanagh, D. J., May, J., Parkin, T., Jones, R., & Andrade, J. (2018). Functional imagery training versus motivational interviewing for weight loss: a randomised controlled trial of brief individual interventions for overweight and obesity. *International Journal of Obesity*, 43(4), 883.
- Spindler, D. J., Allen, M. S., Vella, S. A., & Swann, C. (2019). Motivational-general arousal imagery does not improve decision-making performance in elite endurance cyclists. *Cognition and Emotion*, 33(5), 1084-1093.
- Stoker, M., Lindsay, P., Butt, J., Bawden, M., & Maynard, I. (2016). Elite coaches' experiences of creating pressure training environments for performance enhancement. *International Journal of Sport Psychology*, 47(3), 262-281.
- Swann, C., Rosenbaum, S., Lawrence, A., Vella, S. A., McEwan, D., & Ekkekakis, P. (2020). Updating goal-setting theory in physical activity promotion: a critical conceptual review. *Health Psychology Review*, 1-17.
- Tiffany, S. T., & Hakenewerth, D. M. (1991). The production of smoking urges through an imagery manipulation: Psychophysiological and verbal manifestations. *Addictive Behaviors*, 16(6), 389-400.

IMAGERY FOR SPORT

- Toth, A. J., McNeill, E., Hayes, K., Moran, A. P., & Campbell, M. (2020). Does mental practice still enhance performance? A 24 Year follow-up and meta-analytic replication and extension. *Psychology of Sport and Exercise*, 101672.
- Turner, C., Rhodes, J., Crocker, D., Nedza, K., & May, J. (2020). An Interdisciplinary Approach to Improving the Quality of Life in Postural Orthostatic Tachycardia Syndrome: A Case Study. *Case Studies in Sport and Exercise Psychology*, 4(1), 134-141.
- Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., ... & Marsolais, J. (2003). Les passions de l'ame: on obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85(4), 756.
- Van Raalte, J. L., Vincent, A., & Brewer, B. W. (2016). Self-talk: Review and sport-specific model. *Psychology of Sport and Exercise*, 22, 139-148.
- Vealey, S., & Greenleaf, C. A. (2006). Seeing is believing: Understanding and using imagery in sport In JM Williams (Ed), *Applied Sport Psychology: Personal Growth to Peak Performance* (pp 247-269) San Francisco.
- Wakefield, C. J., & Smith, D. (2009). Impact of differing frequencies of PETTTLEP imagery on netball shooting performance. *Journal of Imagery Research in Sport and Physical Activity*, 4(1).
- Wakefield, C., & Smith, D. (2011). From strength to strength: A single-case design study of PETTTLEP imagery frequency. *The Sport Psychologist*, 25(3), 305-320.
- Wakefield, C. J., Smith, D., Hogard, E., Ellis, R., & Parry, C. (2020). Using PETTTLEP imagery as a simulation technique in nursing: Research and guidelines. *Nurse Education in Practice*, 43, 102700.
- Wakefield, C. J., Smith, D., Moran, A. P., & Holmes, P. (2013). Functional equivalence or behavioural matching? A critical reflection on 15 years of research using the PETTTLEP model of motor imagery. *International Review of Sport and Exercise Psychology*, 6(1), 105-121.
- Weinberg, R. S., & Gould, D. (2018). *Foundations of sport and exercise psychology*, 7E. Human Kinetics.
- Weston, N., Greenlees, I., & Thelwell, R. (2013). A review of Butler and Hardy's (1992) performance profiling procedure within sport. *International Review of Sport and Exercise Psychology*, 6(1), 1-21.

IMAGERY FOR SPORT

- Williams, S. E., Cooley, S. J., & Cumming, J. (2013). Layered stimulus response training improves motor imagery ability and movement execution. *Journal of Sport and Exercise Psychology, 35*(1), 60-71.
- Williams, S. E., & Cumming, J. (2016). Athlete imagery ability: A predictor of confidence and anxiety intensity and direction. *International Journal of Sport and Exercise Psychology, 14*(3), 268-280.
- Wright, C., Hogard, E., Ellis, R., Smith, D., & Kelly, C. (2008). Effect of PETTLEP imagery training on performance of nursing skills: Pilot study. *Journal of Advanced Nursing, 63*(3), 259-265.
- Wright, D. J., Wakefield, C. J., & Smith, D. (2014). Using PETTLEP imagery to improve music performance: A review. *Musicae Scientiae, 18*(4), 448-463.
- Zimmerman, B. J., & Kitsantas, A. (1997). Developmental phases in self-regulation: Shifting from process goals to outcome goals. *Journal of Educational Psychology, 89*(1), 29.