The Modern Performance Coach: Three Steps to Thrive in Today's World

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ABSTRACT

Sports performance is a complicated phenomenon wherein multiple biological subsystems interact with each other in a context-specific manner. The performance coach is the individual who guides athletes through this complex and indeterministic sports world. Unfortunately, the art of coaching has become overshadowed, directing into a dominance of rigorously-controlled and narrowly focused empirical studies, neglecting the essence of the coach. Hence, this article reintroduces the performance coach as of supreme priority. For the coach, broadening the lens and embracing system thinking, as it harmonises with the complexity of the human body, clears the road for constructing a mental model. This mental model should include, among other things, ethical-decision making and teaching sportsmanship. Ultimately, the coach balances the sciences with validation in practice, utilising statistical methods to assess performance numerically along the way. These elements are integral to becoming a modern performance coach and creating an ecosystem wherein all athletes can achieve excellence in their respective sports.

Introduction

Sports performance is a complicated phenomenon wherein multiple biological subsystems interact with each other in a context-specific manner. The modern performance coach has a unique position, steering the athletes through a complex and indeterministic world, making the coach an indispensable team player. Numerous professional sporting organisations acknowledge this art of coaching, proposing contracts of up to 45 million annually. Additionally, athletes competing in individualistic sports articulate that coaches do more than prescribing exercises. In the words of Usain Bolt: "He {my coach} is the greatest person; he has been a father figure, my mentor, he has been a coach, and for me, he is the person that makes me laugh".

This article offers a pragmatic three-step model wherein the metacognition of modern performance coaches is discussed, which affects personal coaching behaviour and ignites specific behaviours in athletes. Therefore, it constructs the breeding grounds of an effective ecosystem and performance excellence. The three steps are written from a different perspective than classic research articles, describing ancient fables, anecdotes, and sometimes fictive stories. In modern times, informational streams are almost infinite, urging the need for synthesising information within the proper context; this is the motivation for doing it differently. Lastly, the steps are described in chronological order, starting from a macro-perspective, and working in the direction of the micro-perspective (Figure 1).

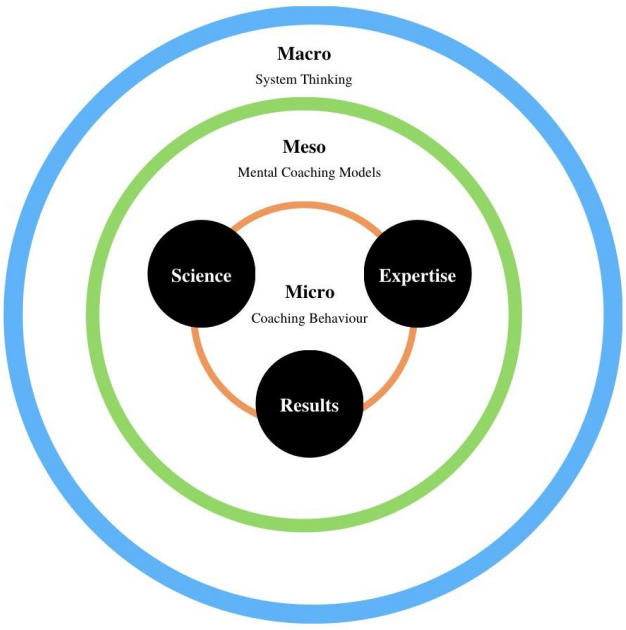

Figure 1: The modern performance coaching ecosystem.

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Step 1: Developing a Broad Coaching Lens

Broad is defined as having a more considerable distance than usual, observing what is usually hidden outside of a narrow gaze. Although the author can scientifically scrutinise the significance of a broad lens, ancient Buddhists cultivated this knowledge decades heretofore in a fable. When six blind—or blindfolded—men observed an elephant, they all came to vastly different conclusions about their feelings. One man was confident that he felt a dinosaur, and the other believed he was standing in front of a wall. The author considers their narrow gaze and subjective experience as the culprit for this inaccurate estimate. Formulating absolute truths from personal experiences without integrating system thinking, mindfulness of potential biases impacted by mental models and previously held beliefs, and contextual influences create a self-created reality. This is evident in modern coaching, wherein some practitioners nearly idolise training methods, supplements and unorthodox recovery strategies, implying they monitor performance coaching from a reductionist lens. Taking a step back, self-questioning the impacts on system integration and contextual specificity elicits a more broad, comprehensive method of thinking—system thinking (Figure 2).

Context: From 200mm to 70mm

Historically, coaching was deemed a subjective discipline wherein details on best training approaches were formulated from practical coaching experiences (Berryman, 2010). Nowadays, the innovation of quantitative research methods, data management and statistical modelling altered the reliance on subjective experiences towards a more academic approach. This transformation has born beautiful fruits, such as improving clinical practices and visualising training modalities' physiological and physiological impacts. However, it also contracted the scientist and performance coach's lenses, whereby only pieces of the performance puzzle are studied. The coach must reverse-engineer this data into information applicable to practice—only possible when considering context specificity. For instance, when an experiment investigates the results of five sets of squats with a load equal to 80% of the participant's one-repetition maximum, the performance coach must need additional contexts, such as training experience, the athlete's calendar, and more, to efficiently utilise this data.

Context connects the training stimulus with its eventual athletic consequences, making it a determinative variable in the performance sciences. Considering context enhances the accuracy of the coach's ability to anticipate training outcomes or at least nuance preliminary scientific investigations. For instance, the training programme of an elite sprinter, such as Usain Bolt, is substantiated by empirical research and high-level coaching but is also dictated by personal preferences and context specificity. Therefore, assuming the training programme is superior in every context is invalid. When an amateur sprinter runs the same programme as Usain Bolt under the supervision of a different performance coach, context-specific factors influence (and presumably decrease) its effectiveness. In this matter, the high training volume combined with suboptimal sprinting biomechanics might enhance injury susceptibility. Also, taking another step back, there needs to be

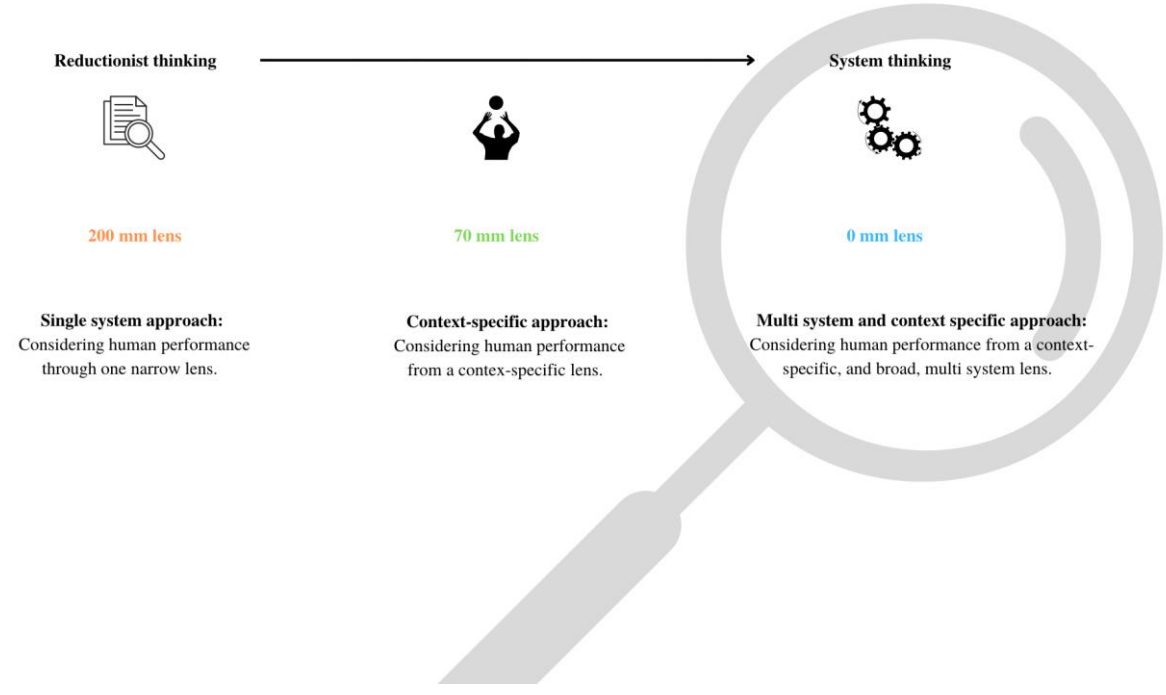


Figure 2: The lenses in today's world of performance coaching.

more time in the demanding amateur sprinter's agenda to execute all training sessions.

Furthermore, the same rule applies during the extrapolation of scientific data—context matters. Training surface, training age, and integration of training modalities within a comprehensive periodisation planning, not neglecting the influence of the performance coach, all constitute contextual variables (Halperin, Pyne and Martin, 2014; Kröger & Watkins, 2021). Hence, data needs context to be interpreted correctly. Being cognizant of these effects determines the coach's success and is the intermediate step towards system thinking.

System-Level Thinking: From 70mm to 0mm

Under the previous heading, the importance of considering contextual-specific qualities was presented. As an advancement, this idea will be expanded with system thinking by proposing the implication of this approach within a performance coaching model.

In the classic coaching process, training initiates with exercise physiological testing incorporated within a more exhaustive needs analysis to acquire subjective and quantitative data, leading to training objectives and the corresponding training modalities. Despite being a fantastic starting point, system thinking ensures the coach pursues the correct path, perhaps opposing reductionist thinkers. For instance, when the one-repetition maximum scores of some athletes are below normative values, it is compelling to restrict time availability for improving other training qualities. However, this is reductionistic thinking, where exclusively linear correlations are elucidated. The belief is that training this specific bio-motor quality improves performance (i.e., forms the leverage point) when maximal strength is below normative values. This thought is not always valid. Targeting one bio-motor quality can cause a chain reaction within human biology, affecting, among other things, psychological, physiological, and sociological subsystems. The physiological impacts may include reduced resilience, motivation and commitment to the training intervention, as a result of which the athlete reduces (or stops) communicating with the performance coach. Therefore, embracing system thinking requires a distinct technique wherein training the leverage point is weighted against potential subsystem interactions. Then, exclusively when the anticipated outcomes of improving the leverage point weights more, is the intervention worth the effort. Hence, a robust educational background, supplemented with practical coaching experience and utilising translation research methodologies, is essential (discussed in step 3).

In brief, when considering context-specificity, the performance coach improves his coaching quality. When this is supplemented with system thinking, the most promising technique in today's complex world of sports is utilised. Weight the pros and the cons—become a system thinker.

Step 2: Building a Mental Model

The broad, system thinking lens constructs an unrestricted pathway towards developing a complete mental model. These are the metacognitive traits of the modern performance coach—the consciousness of personal behaviours—that transfer to all athletes. The significance of a mental model is best explained with a fictive story. Imagine standing on the pitch with a group of athletes playing their most important match of a lifetime, with the possibility of winning the national finals for the first time in ten years. The game is eventually matched when a golden chance presents itself: The opposition is tempered, yielding an aggressive offence on a player—the coach blows his whistle; it is a penalty. There is the possibility of letting the best player, Tommy O'Neal, in to shoot the penalty. However, he began the game on the bench as a disciplinary measure for demonstrating lousy sportsmanship during the last match. During these challenging situations, the performance coach can be prejudiced with a winning at-all-cost mental model; antagonistic mental models drive other coaches. Ultimately, these efforts positively or negatively affect personal behaviours and that of athletes.

The Importance of Mental Models

When performance coaching transpires in the weight room, not at the pitch, the value of a complete mental model remains. For instance, if one of the athletes openly communicates using performance-enhancing substances, the performance coach is dependent on a distinct mental model. Therefore, the subject is further described in a coaching-specific context.

Most sporting institutes and professional clubs have two overarching objectives for the performance coach: (1) enhancing athletic potential and performance and (2) reducing injury susceptibility (Hoffman, 2011). Incorporating and applying this report in a mental model creates two potential outcomes related to the applied coaching lens. When a reductionistic lens is applied, the performance coach can become autocratic, demanding more than possible and forcing all athletes to follow his decisions. The authoritarian coaching style elevates salivary cortical levels in some athletes, implying that some are stressed, which likewise reduces long-term sports participation (Jimenez et al., 2019; Seungmom Tsz & Sang, 2019). Alternatively, a broad coaching lens fills the mental model with additional coaching skills, such as using appropriate pedagogical methods, teaching athletes to make ethical decisions and prioritising moral behaviour (Pisk, 2003). This lays the groundwork for successful coaching (Martens, 2012).

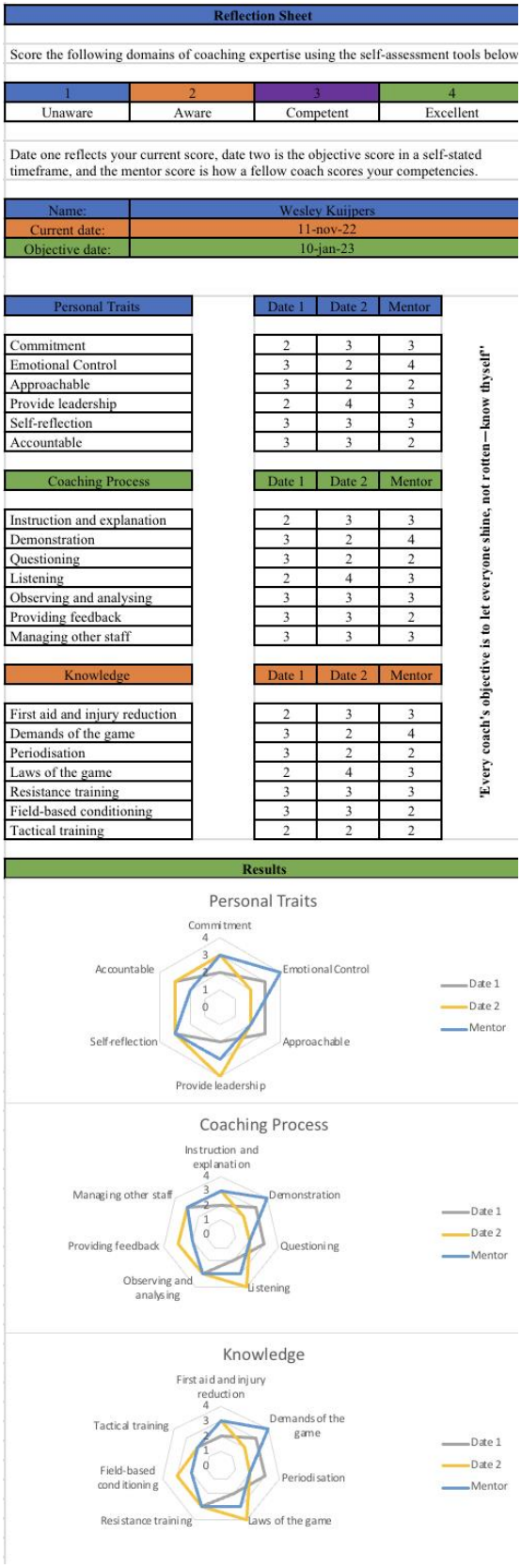
Mental models thus attract behaviour, initially described in an economic context by Rhonda Byrne in her book *The Secret*. The first reductionistic thinker lets Tommy O'Neal shoot the penalty because winning at all costs attracts the coach. In contrast, the other coach considers the moment essential for teaching excellent sporting behaviour, signifying that all actions will have positive or negative outcomes, depending on the context-specific appropriateness of personal behaviour. This coach is attracted to educating and teaching sportsmanship. Thus, stretch barriers via system thinking and construct a complete mental model to attract good behaviours instinctively.

Building a Mental Model

The mental model is a potent driver of personal and athlete behaviour, causing metacognitive traits to become indispensable. Ancient Greek philosophers were already conscious of the impact of metacognition, denoted by the expression *Nosce te Ipsum*. The phrase signifies the power of 'knowing thyself'—by gaining perspective of personal behaviour, learning from past experiences and being open to change. In modern times, the expression is denoted as self-awareness, which inspired the author to develop a reflection sheet (Figure 3).

The reflection sheet is a technique that places specific coaching behaviours in the light. Completing the sheet critically without disguising personal issues provides valuable insights. For instance, it can nurture the expansion of the coach's skill set (Shemshack & Spector, 2020) and improve work quality (Heyer, 2015). However, the performance coach has multiple faces (Martens, 2012), conceivably inducing self-conceived scores to deviate from the scores awarded by other coaches. Accordingly, incorporating an objective peer reflection deepens the reflection procedure, piloting the coach towards new understandings of personal behaviours.

Reflection delivers understanding—combined with a robust action plan and being open to change, the impact on the ecosystem will be enormous. However, the eventual decisive factor is the utilisation of the information. When in the 16th century, Francis Bacon stated that 'knowledge itself is power' and all achievements emanate from this, it was a time wherein knowledge was excessively available to the privileged. In the hyper-connected 21st century, knowledge is everywhere, causing synthesising information within the proper context and practical application to become the real power. Therefore, the modern performance coach reflects, plans and transforms the data into action.



Reflection Sheet

Score the following domains of coaching expertise using the self-assessment tools below

1	2	3	4
Unaware	Aware	Competent	Excellent

Date one reflects your current score, date two is the objective score in a self-stated timeframe, and the mentor score is how a fellow coach scores your competencies.

Name:	Wesley Kuijpers
Current date:	11-nov-22
Objective date:	10-jan-23

Personal Traits	Date 1	Date 2	Mentor
Commitment	2	3	3
Emotional Control	3	2	4
Approachable	3	2	2
Provide leadership	2	4	3
Self-reflection	3	3	3
Accountable	3	3	2

Coaching Process	Date 1	Date 2	Mentor
Instruction and explanation	2	3	3
Demonstration	3	2	4
Questioning	3	2	2
Listening	2	4	3
Observing and analysing	3	3	3
Providing feedback	3	3	2
Managing other staff	3	3	3

Knowledge	Date 1	Date 2	Mentor
First aid and injury reduction	2	3	3
Demands of the game	3	2	4
Periodisation	3	2	2
Laws of the game	2	4	3
Resistance training	3	3	3
Field-based conditioning	3	3	2
Tactical training	2	2	2

"Every coach's objective is to let everyone shine, not rotten—know thyself"

Results

Figure 3: Reflection sheet (filled-in example).

Tip 3: Balancing Science and Practice

Performance coaches have found a relatively new marketing method—relating to themselves as evidence-based practitioners. For some, citing scientific evidence, although often without scrutinising context-specific variables and system integration, is hailed as modern-day coaching. Despite emerging credible, the definition of evidence-based practice has become unsubstantiated and ambiguous, holding no value. Moreover, the almost religious fate in the scientific method, sometimes using scientific data with little practical expertise, overbalances the practical coaching experience and tacit knowledge (knowledge attained through real-world experiences). Therefore, modern coaching reintroduces the field's beginnings, emphasising practical evidence but with the addition of quantitative methods. This ensures that subjective experiences are reinforced with objective data without neglecting contextual factors and system thinking. Scientific data informs the coach in this method, yet practical experience validates this information; it is a translational research method.

Science Versus Expertise

Scientific databases of universities are congested with empirical investigations, which creates an excellent basis for modern coaching. However, utilising this information is only feasible with deliberate reflection, often via revising protocols and merging the data into a comprehensive periodisation planning. Therefore, science and expertise are inextricably connected within the performance coaching discipline.

Science is a term that evokes value and trust, yet exclusively trusting scientific investigations is a fallacy (Sackett et al., 1996; Jeffreys, 2015). Still, coaches benefit from science by reducing the amount of speculation about the training interventions' physiological, psychological, ecological, and integrated impacts. For instance, introducing maximal strength training can initiate by studying neurophysiological mechanisms, the biomechanical and technique-specific considerations associated with increased injury risk, and different queuing strategies from the motor control and skill acquisition research. These elements combined provide a reasonable estimate of how an athlete might react to the training stimuli. However, it will need to be more detailed to be trusted without including coaching expertise within this list.

As noted numerous times, human biology is complex and indeterministic—flawlessly predicting outcomes is impossible. One input affects human biology in multiple subsystems, dictated by contextual, physiological and psychological influences. Thus, when the accordance between scientific investigation's contextual variables and practice does not match, nor will the training effects. For instance, during research, it is not unusual for athletes to rest 48h prior to the experiment, which might conflict with what transpires during periodisation practices. Likewise, a different performance coach delivers the training programme, counting as a contextual variable. This is often not considered during the extrapolating of scientific data. Therefore, translational research methodologies to bridge science with expertise are needed to become a modern performance coach.

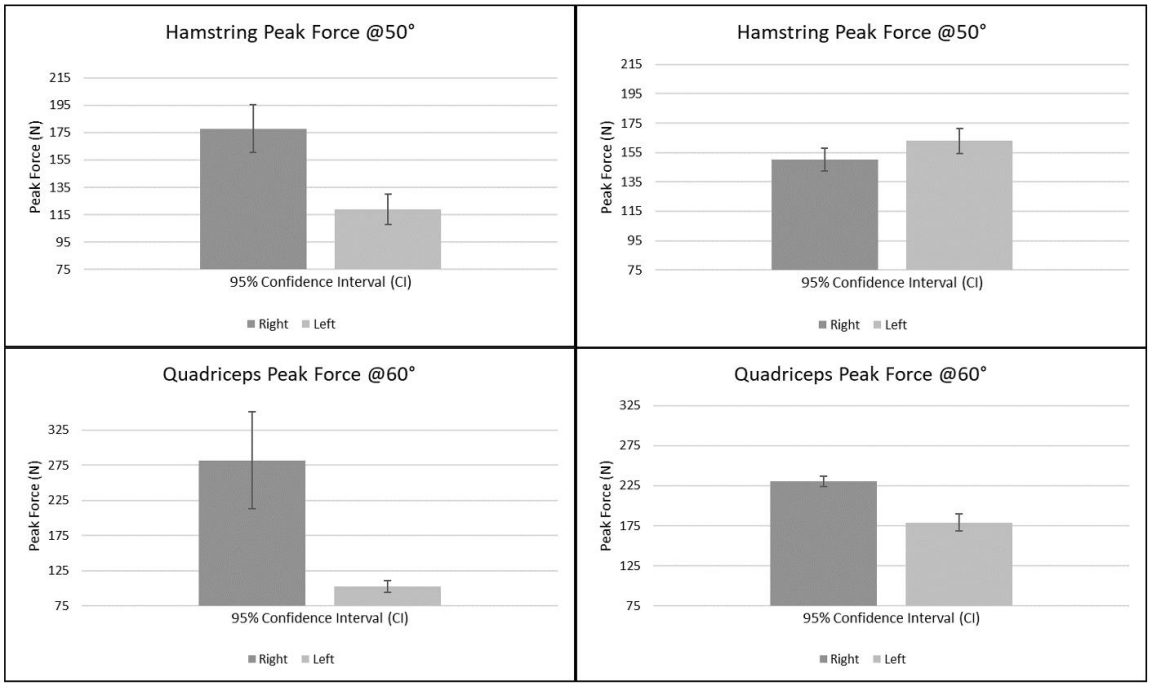


Figure 4: Maximal isometric hamstring force data. The data on the left is gathered six weeks post-operation, and on the right twelve weeks post-operation.

Results

Translational research methodology is defined within the context of this article as the translation of empirical scientific investigations into practical, applicable information. For the modern performance coach, the method includes a numerical performance assessment, including rehabilitation training outcomes, the accuracy of performance, and more. This will not only translate research into practice; it also notifies the interdisciplinary team about the competence of the performance coach. Ultimately, the performance coach utilised performance methods, and interpersonal traits will be examined through won medals and competitions. However, because athletic achievement is a multifactorial concept of modifiable and non-modifiable variables, the performance coach can use quantitative data to report excellence independent of competitive outcomes. Two examples are explained here:

1. A rehabilitating athlete depicts disturbed neurophysiological traits, such as affected motor output from central mechanisms foisted by noxious stimuli and disturbance of other afferent information from mechano-receptors (Chevelle et al., 2018). It is plausible that specific training modes, provoking strong sensory stimuli, restore these mechanisms and improve voluntary force production. However, the information from prior research needs translation into practice through coaching expertise and a numerical assessment of performance results. Elucidating the last comment, the coach can utilise exercise physiological testing with a force sensor to numerically investigate the training intervention outcomes. An example is illustrated in Figure 4 on page 5.

2. Golf is considered a concentration sport, wherein fine motor control and psychological resilience are of utmost importance for successful putting. Increasing arousal just slightly might provoke a too-strong excitation of the nervous system, resulting in putting after the hole. Hence, a numerical putting assessment can connect psychological mood with objective performance outcomes without solely trusting prior scientific studies. Using tape and Microsoft Excel, the putting accuracy can be assessed using relatively simple statistical functions (AVERAGE and STDEV.s). Firstly and prior to the intervention, a baseline score of putting accuracy is computed (Figure 5) and utilised for goal-setting practices (Weinberg, 2013). Secondly, another investigation numerically demonstrates the outcomes of the intervention after the experimental period. Additionally, a third investigation can quantify skills retention a few days, weeks or months after the experimental period. The numerical approach bridges the sciences with expertise and provides the coach with quantifiable data for deep, work-based reflections (Heyer, 2015).

In brief, a numerical performance assessment can translate research into practical, applicable information—notifying the performance coach if the information is valid considering contextual and biological complexity.

Putting Strength (distance before and beyond the hole).

3
0
1
-5
2
-2
-3
-1
-5
-4
3
-6
1
0
0
1
2

All data is presented in centimeters (cm)
* target is 0 cm

Constant Error (AVERAGE function)	0,8 cm	underhitting the ball
Variable Error (STDEV.s function)	2,9 cm	average variability
Total Error	3 cm	total error

Figure 5: Numerical assessment of putting strength.

Conclusion

The obligations and duties of a modern performance coach stretch from developing training programmes to creating an ecosystem wherein all athletes can achieve athletic excellence in their respective sports. This is the art of coaching, elicited through system thinking, a valid mental model, and bridges the sciences with expertise, utilising statistical methods to assess performance numerically along the way. Thus, take the initiative, trust the process and let the magic of a new beginning do its job—thrive as a modern performance coach.

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