Author(s): Viscosi, Jonathan; Robazza, Claudio; Jansson, Billy; Davis, Paul; Ruiz, Montse C.

Title: It's a MuSt win : The effects of self-talk to enhance passing performance under pressure in elite football players

Year: 2024

Version: Accepted version (Final draft)

Please cite the original version:

Viscosi, J., Robazza, C., Jansson, B., Davis, P., & Ruiz, M. C. (2024). It's a MuSt win : The effects of self-talk to enhance passing performance under pressure in elite football players. Sport Psychologist, Early online. https://doi.org/10.1123/tsp.2024-0065

Author Accepted Manuscript

Manuscript to be published in The Sport Psychologist

It's a MuSt win: The Effects of Self-Talk to Enhance Passing Performance Under Pressure in Elite Football Players

Jonathan Viscosi[1], Claudio Robazza[2], Billy Jansson[1], Paul Davis[3] and Montse. C Ruiz[4*]

[1]Department of Psychology and Social Work, Mid Sweden University, Sweden.

[3] Bind-Behavioural Imaging and Neural Dynamics Center, Department of Medicine and Aging Sciences, "G. d'Annunzio" University of Chieti-Pescara, Italy.

[3]Department of Psychology, Umeå University, Sweden.

[4]Faculty of Sport and Health Sciences, University of Jyväskylä, Finland.

* Corresponding author:
Montse Ruiz, PhD, SASP-FEPSAC, UPV (sert.)
Faculty of Sport and Health Sciences
P.O. Box 35 (Viveca 286)
FI-40014 University of Jyväskylä
Finland
Email: montse.ruiz@jyu.fi

It's a MuSt win: The Effects of Self-Talk to Enhance Passing Performance Under Pressure in Elite Football Players

High-achieving athletes invest countless hours of training towards mastering fundamental skills, in attempts to perform to the best of their abilities in competition. While this can produce near-perfect performance levels under optimal conditions (e.g., low stress), achieving the same results under pressure is not guaranteed (Low et al., 2024). At the elite level, the presence of pre-competition anxiety derived from sources of perceived pressure and stress is ubiquitous (Hardy et al., 2018). Extensive research examining the anxiety-performance relationship (see Ong & Chua, 2021 for review) highlights that athletes are better served accepting this reality and developing their abilities to manage their affective states and behavioural responses, rather than relying on favourable conditions to perform optimally (Noetel et al., 2019). The psychological states that characterise peak performance are well documented in the sports psychology literature (Harmison, 2006). Research into the psychological processes that facilitate high-level performance has established an evidence base demonstrating the use of applied interventions to help athletes obtain and sustain optimal performance states (Anderson et al., 2014).

Multi-states (MuSt) theory for self-regulation (Ruiz et al., 2021a) is a framework that accounts for the wide variety of internal and external obstacles athletes are likely to face when competing. It is a dynamic and multidimensional theory that considers the interaction between the individual, task, and environment, appraisals of perceived resources to meet task demands, applied effort towards self-regulation, and performance outcomes. From this lens, MuSt theory intends to describe and understand athletes' unique performance experiences, predict their performance states and outcomes, and identify effective self-regulation strategies. Competitive appraisals arising from the interplay between individual, task, and environment are considered mediators of both the emotion-performance relationship and the attentional focus athletes adopt while performing. When this interaction results in a challenge appraisal, it is predicted to elicit a range of functional emotional states conducive to optimal performance, as well as functional monitoring of actions leading to consistent and effective outcomes. Conversely, a threat appraisal is expected to trigger dysfunctional emotional states, with heightened conscious attention to the task, impairing movement fluidity and automaticity. A stepwise procedure, grounded in the theory, guides the athlete to manage their subjective experiences and optimise performance through emotion- and action-centred self-regulation strategies.

MuSt theory is built upon the theoretical notions of Yuri Hanin's (2000) individual zones of optimal functioning (IZOF) model, the multi-action plan (MAP) intervention (Bortoli et al., 2012), and the identification-control-correction (ICC) program (Hanin & Hanina, 2009). MuSt theory extend previous frameworks by focusing on the dynamic relationship between valence and functionality of athletes' psychobiosocial state, as well as their level of attention monitoring/ control applied to task execution. From this perspective, MuSt theory predicts four performance types and multiple performance-related feeling states, which are constantly subject to change due to the dynamic nature of events and changes in situational demands when competing (Ruiz et al., 2021a). It is contended that the combination of emotion- and action-centred regulation strategies is the most effective method to enhance performance and successfully adapt to changes in the competitive environment. The stepwise procedure for an applied intervention suggests that athletes should first become aware and then accept the variation in performance states they commonly encounter in training and in competition before they can effectively alter them (Ruiz et al., 2019). As such, athletes begin by reflecting on their most successful and unsuccessful performances, to identify the content and intensity of the functional and dysfunctional feeling states they experience when competing (Robazza et al., 2016b). Subsequently, they utilize the MAP intervention (Bortoli et al., 2012) to identify the most important core components of action required for effective task execution (e.g., timing and follow through).

Central to MuSt theory is the appraisal of challenge and threat, which dictates how athletes respond to a demanding situation (Sammy et al., 2021). A challenge state occurs when the athlete appraises their personal resources as equal to or greater than the situational demands, whereas a threat state occurs when situational demands exceed the appraisal of personal resources (Blascovich & Mendes, 2000). Blascovich's (2008) biopsychosocial model of challenge and threat illustrates the physiological responses that occur in the appraisal process and the adaptive and maladaptive effects that challenge and threat states have on performance (Moore et al., 2013). A challenge state involves an approach response to stress and has been associated with better performance, whereas a threat state entails an avoidance response to stress and has been associated with impaired performance (Jones et al., 2009). There are varying degrees of challenge and threat, and the reappraisal process allows athletes to shift between the two states as a competition unfolds (Moore et al., 2013; Seery, 2011). The recently revised theory of challenge and threat state in athletes (TCTSA-R; Meijen et al., 2020) suggests that challenge and threat can be classified into four categories: high challenge, low challenge, low threat, high threat.

In consideration of the four performance types predicted by MuSt theory, Type 1 represents a high-performance state characterised by functionality and is often accompanied by pleasant experiences, with minimal action monitoring, typically triggered by a challenge appraisal. Pleasant-functional states and low levels of action monitoring can facilitate moments of ´flow´ (Jackson & Csikszentmihalyi, 1999), where attention and task execution seem to occur automatically and effortlessly. While it is a highly rewarding state, athletes and researchers have described it as rare and elusive, especially when intentionally striving to achieve it (Aherne et al., 2011). Type 2 performance occurs more frequently and can be achieved and maintained more reliably. It is also triggered by a challenge appraisal, but it involves a higher degree of action monitoring and deliberate focus on predetermined core components of action for successful task execution. It is similar to a clutch state (Otten, 2009; Hibbs, 2010), which is a more effortful approach to heightened performance and supports the premise of “making something happen”, whereas a flow-like state alludes to the idea of “letting it happen” (Swann et al., 2016). Athletes can function optimally even under unpleasant affective conditions, allowing for successful performance regardless of one’s emotional state. Type 3 performance is depicted as a dysfunctional, often unpleasant state, wherein athletes feel overwhelmed by the demands of the situation, which they perceive as a threat. In their attempt to cope with the stress of the event, athletes become distracted from task-relevant cues and exert excessive attentional control on action execution, impairing movement fluidity and automaticity. This state has similarities with the “choking” under pressure perspective (Mesagno et al., 2015). Type 4 represents an unmotivated or complacent performance state, often stemming from a misappraisal of situational demands, leading to inadequate recruitment of resources and resulting in low task engagement, unfocused attention, and minimal energy or effort directed towards goal-directed behaviours. It is a dysfunctional state typically associated with poor performance, although affective valence can still be pleasant.

Research has shown that athletes transition between performance states as a competitive event unfolds (Schweickle et al., 2021; Swann et al., 2016, 2017). There are several determinants that can cause transitions across multiple performance states. Within a functional state, unexpected events, amplified pressure, and fatigue can determine changes in the athlete's feeling state (e.g., pleasant/ unpleasant) and the degree of action monitoring they apply to task execution (e.g., high/ low). Within a dysfunctional state, unpredictable events, competitive stress, and exhaustion can cause fluctuations in hedonic tone and valence of mostly unpleasant feeling states, and varying degrees of action control. Athletes can also transition between functional and dysfunctional states as a result of unfolding events, strong emotion content, and re-appraisal of situational demands.

MuSt theory's application of individual profiling allows athletes to predetermine the feelings and behaviours that they associate with effective performance and have both emotion- and action-centred self-regulation plans in place to achieve optimal performance levels. While emotion-centred self-regulation strategies are effective to maintain and enhance optimal conditions (e.g., Type 1 and 2 performance) it can be problematic when attempting to regulate the suboptimal conditions triggered by a threat perception (e.g., Type 3 and 4 performance) due to the unfavourable psychophysiological effects that can leave the athlete feeling "overtaken" by their affective experience (Hill & Hemmings, 2015). In such instances, MuSt theory suggests that athletes employ an action-oriented approach to stabilise the dysfunctional effects of distress and regain control of their performance. By redirecting attention to behavioural processes (i.e., core component of action), one's emotional state can also be improved as an indirect effect of other psychological processes (e.g., mindfulness and acceptance; Fink & Ruiz, 2021). Once performance conditions are stabilised, athletes can then apply emotion-centred self-regulation strategies to enhance functional feeling states and reduce action monitoring to allow for more fluidity and automaticity in their movement patterns that can lead them to the optimal Type 1 performance state (see Ruiz et al., 2021a, for more details on the stepwise process and applications).

Self-regulation of emotional states and action can benefit from self-talk strategies. Deliberate self-talk is one of the most prevalent mental skills athletes can use to regulate their internal state and guide performance processes (Van Raalte et al., 2016). The literature has predominately focused on two categories of self-talk, organic and strategic (Fritsch et al., 2021). Organic self-talk refers to the verbal-dialogue the individual engages in with themselves, reflecting their interpretation of their inner state and ongoing thought processes. In contrast, strategic self-talk involves the use of pre-established cues (e.g., words or phrases) to convey specific messages aimed at activating an appropriate response to enhance performance and achieving a desired outcome (Latinjak et al., 2019).

Previous research has shown that strategic cue words are effective for regulating one's affective state and improving task execution (Hatzigeorgiadis et al., 2008, 2011; Ziegler, 1987). Cue words are categorized as instructional or motivational, each serving specific performance-related functions (Hardy et al., 2018). Experimental studies have shown that motivational cue words are the most effective for emotion regulation, while instructional cue words are most effective for attention regulation and task execution (see Hatzigeorgiadis et al., 2011, for a meta-analysis). Research on applied self-talk interventions has demonstrated how athletes can take control of their organic self-talk and strategically direct it towards their performance goals (Bellomo et al., 2020; Latinjak et al., 2014). Cue words should be tailored to the specific characteristics of the individual and the demands of their competitive environment (Theodorakis et al., 2012). Athletes are encouraged to select their own cue words and integrate them into their self-determined self-talk strategies used in their training environment, and subsequently employing them effectively in competition (Hardy 2006; Weinberg et al., 2012). In an interdisciplinary review of self-talk literature, Latinjak and colleagues (2023) highlight the need for a theory-based approach when conducting self-talk research, integrating theoretical frameworks of self-regulation and emotion with self-talk interventions. The review also highlighted the need for future research to include manipulation checks to measure the degree in which self-talk cues are used by participants.

Study Purpose

The present study was conducted to test the tenets of MuSt theory in a technical-skilled performance task involving male junior football players competing at the elite level in Finland. In this study we considered the interaction between valence and functionality of the athletes psychobiosocial state, along with levels of action monitoring or control directed towards task execution. Additionally, we examined the effectiveness of different self-talk strategies on passing performance over multiple trials. The task was designed to test the players' passing abilities under pressure while applying specific self-talk cue words to facilitate goal attainment and regulate emotion- and action-centred components. We hypothesised that the use of strategic self-talk would improve passing performance compared to baseline measures wherein self-talk was not utilized. In line with the assumptions of MuSt theory, we expected that the combination of emotion- and action-centred cue words would be the most effective self-talk strategy to improve passing performance under pressure. We also hypothesised that passing performance would correlate positively with challenge state, and negatively with threat state.

Methods

Participants

A priori power analysis for a 2 × 6 mixed-subjects analysis of variance (ANOVA) design (within-between interaction), with an anticipated medium effect size (f = .25), statistical power set at .80, α level of .05 (correlation among repeated measures = .5) suggested a minimum sample size of 20 was required (G*Power 3.1.9.7 software; Faul et al., 2009). The same power, α level, and correlation among measures has been used in previous research on self-talk in sport (e.g., Sarig et al., 2023). We initially recruited 25 male participants, aged 18 to 21 (M = 18.6, SD = .96) from a Finnish football club who competed in the nation's highest professional league. The players were selected from the combined A-Juniors/Academy developmental program. The testing took place in the early stages of preseason, where the players' training schedule consisted of four team training sessions on a weekly basis. During this period the field conditions were affected by snow and ice. The players reported an average of 10.28 hours of football training a week (SD = 1.54). Players who were unable to attend all sessions were omitted from the study. In the end 20 of the 25 players completed all three testing sessions.

Measures

Psychobiosocial States Scale

The Psychobiosocial States Scale (PBS-S; Ruiz et al. 2019) consists of 20 rows with 74 descriptors (3-4 per row) assessing the eight modalities of an athlete's psychobiosocial state while performing: emotional, cognitive, motivational, volitional, bodily somatic, motor-behavioural, operational, and communicative. Each modality is assessed by two rows of items, one is functional (+) and the other is dysfunctional (-) to performance. Each row has several synonym adjectives that describe aspects of the athlete's individual experience and equate to one item in the scale. While reflecting on their best performances, participants are instructed to circle the words in each row that best describes their desired feeling state and to rate the optimal intensity for each state on a scale ranging from 0 (*not at all*) to 4 (*very much*). The scale also extends to rating the anticipated impact the feeling states will have on their upcoming performances; however, we did not use this feature in this study. The scale was available to the participants in both Finnish and English as the words might resonate differently with them in their native language (Ruiz et al., 2019).

Core Components of Action

A list of behavioural and visual cues representing the key elements of the inside of the foot passing action was compiled from the Finnish Football Association's coaching education module of technical skills training (Lipponen, 2022). In accordance with the MAP intervention (Bortoli et al., 2012), participants evaluated the different core components of action and selected the two cues that were most important to them when executing the optimal pass. The list was available to the participants in both Finnish and English, and they were encouraged to add any additional descriptor or metaphorical cue (Ruiz & Hanin, 2004) that depicted the optimal passing action that was not on the list (Hanin & Hanina, 2009). For example, "stick the pass to the surface", "shape it in the net", "drive it to the goal", "punch it in", "cushion the first touch". The cues the players selected became the action-centred cue words that they were instructed to apply in the second phase of the study.

Goal Manipulation

The passing task inherently entails a baseline level of performance pressure due to the competitive nature and aspects of social comparison prevalent in the elite training environment (Diel et al., 2021). A goal manipulation was intended to trigger unfavourable mental and physiological effects by associating clear goals with performance (Cooke et al., 2011), designed to increase the importance of the outcome (Baumeister, 1984), and call on self-regulation strategies to stabilise the effects of competitive stress (Robazza et al., 2016a).

Self-talk Intervention

Based on previous research highlighting the effectiveness of self-talk interventions in sport performance (e.g., Hatzigeorgiadis et al., 2011; Walter et al., 2019; Weinberg et al., 2012), the participants were given a brief introduction on the benefits of self-talk and its utility as a mental skill for self-regulation and performance optimization. Pre-determined cue words were applied as a self-talk intervention to improve performance conditions, specifically focusing on improving passing execution and regulating perceived pressure (Latinjak et al., 2019). Both motivational and instructional strategic self-talk cues were employed to reinforce and support specific aspects of performance enhancement and self-regulation (Abdoli et al., 2018; Bellomo et al., 2020; Hatzigeorgiadis et al., 2014). These cues served as achieving outcome goals (e.g., "you can do it"), reconnecting with optimal feeling states (e.g., "relaxed" or "confident"), activating core components of action (e.g., "first touch" or "contact through the middle of the ball"), and combining feeling and action cues together (e.g., "confident" and "first touch"). Motivational self-talk directed towards achieving goals and feeling states were intended to reinforce strategic cues, while instructional self-talk directed towards action components were intended to complement them.

Demand to Resource Evaluation

A two-item demand-to-resource evaluation, derived from Tomaka et al. (1993) – cognitive appraisal ratio, was used to measure the participants' motivational approach prior to performing each trial, based on their evaluation of task demands in relation to their personal resources. This measure has been frequently used as an effective method of capturing challenge and threat states in real-time competitive situations (Moore et al., 2013). Competition demands were assessed by asking, *"How demanding do you expect the upcoming task to be?"* Personal coping resources were measured by asking the participants, *"How able are you to cope with the* *demands of the upcoming task?"* The questions were rated on a 6-point Likert scale anchored by 1 (*not at all*) to 6 (*extremely*). A demand to resource evaluation score was calculated by subtracting the coping resources rating from the expected demand rating (ranging from: +5 to – 5). Positive scores reflect a high/ low degree of challenge state, and negative scores reflect a high/ low degree of threat state (Moore et al, 2013).

Manipulation Check

At the end of each trial, participants were presented three questions to assess their interaction with the prescribed conditions. They were asked to rate: (a) effort put into applying the given self-talk cue; (b) whether any other cue was used, if so to indicate the other cue used and the effort applied to it; and (c) the effectiveness of the self-talk cue on their passing performance. Responses were recorded using a 10-point scale ranging from 0 (*not at all*) to 10 (*all the time*) for question (a) and (b), and from 0 (*not at all effective*) to 10 (*very much effective*) for question (c).

Follow-up Questions

Upon completing all of the trials, participants were asked: (a) whether any self-talk cue was used, if so, to specify the cue and the degree in which the cue was used on a scale from 0 (*not at all*) to 10 (*all the time*); and (b) the effectiveness of the cue used, rating from 0 (*not at all effective*) to 10 (*very much effective*).

Passing task

The content of the passing task is depicted in Figure 1. The player being tested was positioned 20m in front of the two small goals (1.80m x 1.20m), spaced 10m apart. The player received the ball from the server directly in front of them and had two touches to execute their pass into one of the small goals. Players were given 10 attempts and were required to pass five times with their right foot and five times with their left. Performance was measured objectively by the number of successful passes converted into the small goals. The task was instructed to be performed at “game speed”.

Insert Figure 1

Procedure

Players were informed about the purpose of the study, the procedures, confidentiality of results, and the voluntary nature of participation. Ethical approval was granted from the Human Sciences Ethics Committee of the University of Jyväskylä, and the study was conducted in accordance with the declaration of Helsinki. Before the study began, a signed consent form was collected from the players, and they were assigned an identification number to ensure anonymity.

The testing took place over eight days, with each session being conducted on a different day at approximately the same time of day. The experimental design is illustrated in the flow chart (see Figure 2), providing a visual representation of the trials and associated conditions conducted in each session. Session 1 was the baseline assessment. Participants were informed on the procedure of the session and were given clear instructions on how the passing task must be executed. The players underwent two trials of the passing task. The warm-up round, consisting of 10 passes, to familiarise themselves with the task and to find the right tempo to execute their passes effectively at “game speed”. Then the recorded round, labelled Trial 1, with the score serving as the baseline measure of performance. Directly after Trial 1, participants completed the PBS-S scale (Ruiz et al., 2019) while reflecting on how they wanted to feel when performing optimally in the passing task. They were then given the core components of action list and were instructed to select the two cues that they deemed as most important for executing the optimal pass. Once all data collection for Session 1 was completed, the players were randomly assigned to either the Combined-strategy group or Preferred-strategy group, consisting of ten players in each group. The players were informed of their group membership and the specific time they needed to report to Session 2 (see below for description of the conditions).

In Session 2, the self-talk intervention was applied. The session took place two days after Session 1. The Preferred-strategy group came to the performance task area at the designated time, and the procedure for Session 2 was explained. The Combined-strategy group followed 90 minutes later with the identical procedure. The players were given a brief introduction on the benefits of self-talk and how cue words should be applied before every pass. The players were instructed to prepare themselves by warming up before coming to the passing task area, to ensure readiness and mitigate the risk of injury. Two players participated simultaneously in the four consecutive trials, alternating after each one with similar rest time in between. There were four trials with five different conditions applied as follows:

1. *Goal setting condition.* The players were instructed to aim for an increase in their success rate by at least +1 from their baseline score recorded in Session 1 (e.g., if their baseline score was 4/10, in this trial they were tasked with converting at least 5/10 passes).
2. *Feeling state condition.* The players were instructed to use their pre-selected self-talk cues related to their optimal feeling states before each pass.
3. *Core components of action condition.* The players were instructed to use their pre-selected self-talk cues regarding their core components of actions before each pass.
4. *Preferred group condition*. The players in this group were instructed to perform the task, using the self-talk strategy they found to be most effective, and to use the cue before each pass.

5. *Combined group condition*. The players in this group were instructed to combine self-talk regarding their optimal feelings and the core components of the action before each pass.

Prior to each trial, players responded to the two-item demand-to-resource evaluation (Moore et al., 2013), and after each trial the players responded to the three-item manipulation check questionnaire regarding their experience with the instructed condition.

Session 3**,** the follow-up assessment, was conducted two days after Session 2. Participants from both groups were gathered indoors and received instructions for the final testing session. All participants completed two final trials of the passing task. The first trial was a warm-up, consisting of 10 passes at their own pace, and the second was labelled as “Trial 6”, representing the final recorded trial. The players were encouraged to strive for their best performance during this trial by applying the self-talk strategy that they found most effective. Prior to Trial 6, players completed the two-item demand-to-resource evaluation (Moore et al., 2013), and after Trial 6, they completed the final follow-up questions.

Data Analysis

The data was analysed using JASP statistics version 0.18.3 (JASP Team, 2022). An individual profile of a single player’s optimal performance state was created using the data collected from the PBS-Scale and the core components of action for optimal passing performance. A 2 (group) × 6 (Trial) mixed ANOVA was then conducted to examine the differences in average performance between the two groups throughout the three sessions. A 2 × 2 mixed ANOVA was also conducted to specifically compare the difference between baseline performance in Trial 1 and the final performance in Trial 6. To determine the changes in performance at the intra-individual level, a reliable change index (RCI) was calculated by subtracting each of the player's best performance from their baseline performance and then dividing the value by the standard deviation of the difference in scores for all participants (Christensen & Mendoza, 1986). Pearson correlation analyses were conducted to investigate the potential associations between applied effort, demand to resource appraisals, cue effectiveness and performance scores (Tan, 2014). Lastly, a subsequent 2 (group) × 6 (Trial) mixed ANOVA was performed with low and high challenge state as the group factor.

Results

The individual profile presented in Figure 3, offers a representative depiction of a single player's optimal intensity levels of both functional and dysfunctional feeling states assessed from the PBS-Scale in Session 1. The player listed *Relaxed* and *Alert* as his most important feeling cues. The profile also includes the two most important core components of action the player identified in Session 1, which were *weight of pass* and *arms used for balance*. These were the player's feeling and action cue words that were used as self-talk strategies in Sessions 2 and 3.

Insert Figure 3

Quantitative Results

The mixed ANOVA between the Preferred-strategy group and the Combined-strategy group across the six trials, did not yield significant main effects of Group, $F(5, 90) = 1.95$, $p = .094$, $\eta_p^2 = .070$, or Group × Trial interaction $F(5, 90) = 1.182$, $p = .324$, $\eta_p^2 = .043$. However, as seen in Figure 4, there is a clear increase in average performance from baseline to Trial 6. This was further investigated by performing a 2 × 2 mixed ANOVA using baseline and Trial 6 as within-factors, which resulted in a significant main effect of performance, $F(1, 18) = 23.045$, $p < .001$, $\eta_p^2 = .561$, showing that the use of strategic self-talk cues enhanced performance. The interaction between average performance and group was also significant, $F(1, 18) = 6.682$, $p =$

.019, $\eta_p^2 = .271$, showing that the Preferred-strategy group (*M* = 5.50, *SD* = 1.35) performed substantially better (Cohen's *d* = .90) than Combined-strategy group (*M* = 4.40, *SD* = 1.08) in Trial 6, even though the effect failed to reach significance ($t = 2.01$, $p = .059$). Baseline results ensured there was no major difference in skill level between the players (*M* = 3.65, *SD* = .988).

Insert Figure 4

The reliable change indices (RCIs) indicated that 19 of the 20 players improved their performance from their baseline score when strategic self-talk was used. An RCI > 1.96 reflects a significant change in performance (Christensen & Mendoza, 1986), which was achieved by 8 players (three players had an RCI = 3.37 and five players had an RCI = 2.02). Four players had an RCI = 1.35 and seven players had an RCI = 0.68, which is deemed statistically insignificant.

The trials in which the RCI was derived, provided an indication of the self-talk strategy that was most effective for each player. Many players reported using an alternate self-talk strategy than the one they were prescribed, or they combined it with another strategy. In total six different self-talk strategies were used (see descriptive statistics in Table 1). Of the eight players who achieved a significant RCI, six of them did so by using a combined strategy.

Insert Table 1

The data reported in Table 1 shows that the combined strategy of feeling and action cue words was the most frequently applied strategy and yielded the highest average performance. In Trial 6 where all twenty players were free to use the self-talk strategy they found most effective, 13 choose a combined self-talk strategy and performed marginally better (*M* = 5.08, *SD* = 1.32) than seven players who used a single strategy (*M* = 4.71, *SD* = 1.38). In regard to the effectiveness ratings of all self-talk strategies, as Table 1 highlights the players perceived the combination of feeling and action cue words to be the most effective self-talk strategy they used to enhance their performance.

A correlational analysis, using data from Trial 6, indicated that when applied effort towards a specific self-talk strategy was high, higher levels of performance were achieved (r = .609, p = .004), and the self-talk cues were perceived as highly effective (r = .626, p = .003). Furthermore, higher performance scores were associated with higher effectiveness ratings of the self-talk strategies applied (r = .659, p = .002). Similar patterns were found in the correlational analyses of Trials 3 and 4, but not in Trials 2 and 5.

Based on average demand to resources appraisal in each trial, all 20 players perceived a challenge state and were thus grouped into low (n = 9) and high (n = 11) challenge state, based on a median split of 2.5 (i.e., < 2.5= high challenge, > 2.5= low challenge). A 2 x 6 mixed ANOVA was performed with low and high challenge state as the between subject's factor. Contrary the third hypothesis, the analysis showed that the degree of challenge state was not related to average performance across the six trials $F(5, 90) = 1.928$, $p = .097$, $\eta_p^2 = .097$.

Qualitative Recounts of Strategic Self-talk Effectiveness

Qualitative feedback from the players suggested that they perceived the self-talk strategies as effective. Notably, one player stated, "every time I said my cue words, I passed it into the goal, and the times that I didn't intentionally say them, I missed." Another player who was experiencing negative organic self-talk after missing consecutive passes said, "my feeling state cue helped me stay positive and focus on each pass independently, and not get angry with the passes that I missed." Four players reported that the action-centred cues only worked for them when they managed to achieve their desired feeling state. One player stated, "when I focus solely on the action cues, I become too careful and over controlling, but when I say the cue 'effortless' while focusing on my action cues, it feels more natural." Another player said, "I would go for the action component, but remain carefree and it worked well for me."

Discussion

The aim of this study was to test the tenets of MuSt theory and examine how different forms of self-talk can be used to self-regulate the effects of pressure and enhance passing performance. The findings indicated that the use of strategic self-talk was an effective method for regulating the effects of pressure and enhancing passing performance; specifically, the combination of feeling and action cue words was the most effective strategy, reflecting the highest average performance across all trials.

Although it was not possible to directly control each players' adherence to the prescribed use of self-talk across conditions, the manipulation checks indicated the level of effort exerted on the given cues and whether alternative forms of self-talk were used. The results showed that players utilized various combinations of the self-talk cues, with a preference of incorporating both emotion- and action-based cues when given the option to choose their own preferred strategy. The self-talk conditions prescribed in Session 2 enabled the players to identify the most effective strategies and when asked to produce their optimal performance in Session 3, the players relied on the self-talk strategy that they found most effective. Although the goal-setting condition was intended to create pressure, some players improved their passing performance by combining self-talk geared towards achieving their goal with feeling or action cues. The feeling state condition proved to be more effective than the action condition when both were applied as a single strategy. This is in line with the findings of Hardy et al. (2015) that showed motivational self-talk (e.g., feeling cues) is more beneficial for improving passing performance in comparison to instructional self-talk (e.g., action cues). These results challenge the predominant view established by previous self-talk studies that show the contrary when it comes to accuracy-based tasks (Abdoli et al., 2018; Bellomo et al., 2020; Hatzigeorgiadis et al., 2014). Hardy and colleagues believe this is partially due to the relative skill level of the participants, as well as the "self-focus" that stems from instructional cues, which can be an impediment to successful execution when performing a dynamic task that involves both precision and physical effort. This also points to the functional range of variability MuSt theory accounts for within the idiosyncratic movement patterns. When athletes excessively focus on action components, they may fall into the dysfunctional range where they exert too much control on skills that are normally executed automatically; however, increasing attention monitoring on a few 'selected' core components of action can help the athlete execute their actions more consistently within their functional range (Ruiz et al., 2021a). MuSt theory posits a self-regulation strategy that combines feeling and action components to derive a functional state that can lead to optimal performance, the findings of the present study lend support to this proposal.

The use of the PBS-Scale and core components of action list at the beginning of the study, assisted the players to reflect on the feeling and action components associated with effective passing performance, and covertly encouraged them to apply self-talk towards their feeling and action cues. This underscores the importance of recognizing the specific performance states subjectively associated with the optimal conditions that facilitate peak performance. By doing so, intentional effort towards self-regulation can be applied, enabling athletes to achieve their desired conditions that promote optimal performance (Hanin & Hanina, 2009; Robazza et al., 2016a; Ruiz et al., 2019).

A strength of this study was conducting the experiment outdoors, over an eight-day period in late November, which presented challenging and adverse weather conditions. These circumstances required deliberate and effortful self-talk to effectively manage the internal and external obstacles that can hinder optimal performance. In all three sessions, every player had to contend with the same snowy and icy conditions which affected the specific elements of the passing task and required quick adjustments and adaptations to the technical aspects of the pass. These environmental demands can relate with Type 2 performance within MuSt theory, wherein players are required to accept undesirable conditions and apply conscious effort to their core components of action to execute effective passes in such conditions, whilst attempting to regulate their subjective experiences (Ruiz et al., 2021a). Challenging conditions made it difficult to achieve a Type 1 performance, as deliberate effort and action monitoring was needed to produce consistent outcomes on the slippery surface. Type 3 and Type 4 performance patterns were recognised in Trial 2, where players had the goal of improving their baseline performance. The players who felt threatened by the prospect of underachieving reported negative self-talk and performed poorly. Conversely, the players who underestimated the demands of the task (i.e., perceived the demands of achieving the outcome goal as low) also performed poorly, thus suggesting they were complacent in their efforts. The detrimental effects of pressure were most noticeable in Session 1, where many players performed better in their warm-up round than in the actual recorded round. There was a clear variation in passing quality when performance expectations were challenged, and with increasing pressure. This was addressed in Session 3, where the players were instructed to deliver their best performance in the final recorded round. Interestingly, the average performance in Session 3 was the highest, indicating a desire and willingness among the players to “make something happen” as described by Swann et al. (2016) in their study on clutch performance.

Limitations and Future Directions

A limitation of the study is the small sample size and the limited number of passing attempts that made changes in performance types difficult to quantify. With only 10 passes, the margin for error was small and players had limited opportunities to adjust their performance within a single trial round. Thus, not all performance scores are an accurate reflection of how well the self-talk cues were applied. This also led to a narrow disparity of performance scores (*M* = 4.15, *SD* = 1.58), limiting our ability to draw more definitive conclusions on the effect of different self-talk strategies. The results could have been more robust with the inclusion of a pure control group, allowi1 1ng for a clearer comparison of overall performance between participants who used self-talk and those who did not (e.g., Galanis et al., 2018). Future research could investigate the different self-talk strategies over a longer period of performance (e.g., Wood et al., 2017) and with a larger and more diverse sample of participants (Perkos et al., 2002). This approach could provide deeper insights into how players transition between performance types in a real-world context. Alternatively, by increasing the number of passing attempts, the players would have greater opportunities to recover from temporary declines in performance and maintain high performance levels over longer durations (e.g., van Maarseveen & Oudejans, 2018; Wolch et al., 2020). Future research could explore perceived pressure, negative self-talk, distractions, and other factors known to influence performance. In addition to psychological assessments, incorporating biological measurement could provide information with respect to the physiological effects of changes in performance states (e.g., Davis & Stenling, 2020). This approach could identify the most effective self-talk strategies for overcoming specific psychological barriers commonly encountered by elite performers. Lastly, it would be interesting to observe the same study design extended to other dynamic sports (e.g., basketball, ice-hockey, handball, tennis) that contain precision- and accuracy-based skills, which can also be tested in a controlled manner with static targets.

Practical Implications

The study underscores the benefits of understanding both the functional and dysfunctional performance-related states that athletes may experience. Additionally, it emphasizes the value of identifying core components of action at an early stage, enabling athletes to focus their attention on these elements during challenging moments, which could help athletes to stabilise performance and regain optimal levels of control (Ruiz et al., 2021a). Practitioners can assist athletes in this process by using individual profiling methods that are highlighted in MuSt framework (Ruiz et al., 2021b). Additionally, coaches may also benefit from having predetermined strategic cue words readily available for both a motivational- and instructional purpose. They can serve to regulate emotional and behavioural responses, but also reinforce the collective team/ individual performance mentality (Davis & Davis, 2016). Cue words should align with performance plans and be communicated to remind players of what is needed during critical moments (e.g., late in the game) when managing emotions and fatigue become increasingly more difficult, and when the susceptibility to internal and external distractions peaks (Nideffer & Sagal, 2006). From a training perspective, the design of this performance task can serve as a form of pressure training (Kegelaers & Oudejans, 2024; Low et al., 2021), where specific mental skills, such as self-talk and imagery, can be practiced simultaneously with technical skills, such as passing and shooting. This occurs under intentional doses of manipulated pressure, aiding in the development of their abilities to execute skills under various conditions (Low et al., 2024).

In conclusion, this study provides additional support that self-talk is an effective form of self-regulation, especially when utilizing a combination of emotion- and action-centred self-talk cue words for dealing with pressure and enhancing performance. The study contributes to the extensive body of IZOF literature that supports the use of individual profiles as an effective tool for optimising consistent performance levels and maximising athletic potential (Ruiz et al., 2017). Further, the study adds to the self-talk literature by demonstrating the efficacy of strategic cue words as a means of effective self-regulation; specifically, we highlight the importance of combining instructional and motivational cue words to regulate emotion and action for optimal performance. Lastly, for athletes striving to consistently perform at their best under pressure, self-regulation is not only a requirement, it’s a MuSt win!

References

Abdoli, B., Hardy, J., Riyahi, J. F., & Farsi, A. (2018). A closer look at how self-talk influences skilled basketball performance. *The Sport Psychologist, 32*(1), 9-15. https://doi.org/10.1123/tsp.2016-0162

Aherne, C., & Moran, A., & Lonsdale, C. (2011). The effect of mindfulness training on athletes' flow: An initial investigation. *The Sport Psychologist, 25*(2)*,* 177-189. https://doi.org/10.1123/tsp.25.2.177

Anderson, R., Hanrahan, S. J., & Mallett, C. J. (2014). Investigating the optimal psychological state for peak performance in Australian elite athletes. *Journal of Applied Sport Psychology, 26*(3), 318–333. https://doi.org/10.1080/10413200.2014.885915

Baumeister, R. F. (1984). Choking under pressure: Self-consciousness and paradoxical effects of incentives on skillful performance. *Journal of Personality and Social Psychology, 46*(3), 610–620. https://doi.org/10.1037/0022-3514.46.3.610

Bellomo, E., Cooke, A., Gallicchio, G., Ring, C., & Hardy, J. (2020). Mind and body: Psychophysiological profiles of instructional and motivational self-talk. *Psychophysiology*, *57*(9), Article e13586. https://doi.org/10.1111/psyp.13586

Blascovich, J., (2008). Challenge and threat. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation* (pp. 431–445). Psychology Press.

Blascovich, J., & Mendes, W. B. (2000). Challenge and threat appraisals: The role of affective cues. In J. P. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition* (pp. 59–82). Cambridge University Press.

Bortoli, L., Bertollo, M., Hanin, Y., & Robazza, C. (2012). Striving for excellence: A multi-action plan intervention model for Shooters. *Psychology of Sport and Exercise, 13*(5), 693–701. https://doi.org/10.1016/j.psychsport.2012.04.006

Christensen, L., & Mendoza, J. L. (1986). A method of assessing change in a single subject: An alteration of the RC index. *Behavior Therapy, 17*(3), 305–308. https://doi.org/10.1016/S0005-7894(86)80060-0

Cooke, A., Kavussanu, M., McIntyre, D., Boardley, I. D., & Ring, C. (2011). Effects of competitive pressure on expert performance: Underlying psychological, physiological, and kinematic mechanisms. *Psychophysiology, 48*(8), 1146–1156. https://doi.org/10.1111/j.1469-8986.2011.01175

Davis, P., & Davis, L. (2016). Emotions and emotions regulation in coaching. In P. Davis (Ed.), *The psychology of effective coaching and management* (pp. 285-306). Nova Science.

Davis, P., & Stenling, A. (2020). Temporal aspects of affective states, physiological responses, and perceived exertion in competitive cycling time trials. *Scandinavian Journal of Medicine & Science in Sports*, *30*(10),1859-1868. https://doi.org/10.1111/sms.13766

Diel, K., Broeker, L., Raab, M., & Hofmann, W. (2021). Motivational and emotional effects of social comparison in sports. *Psychology of Sport and Exercise, 57,* 102048. https://doi.org/10.1016/j.psychsport.2021.102048

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior research methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Fink, C., & Ruiz, M. C. (2021). Mindfulness and emotions in sport. In M. C. Ruiz & C. Robazza (Eds.), *Feelings in sport: Theory, research, and practical implications for performance* *and well-being* (pp. 143–154). Routledge/Taylor & Francis Group. https://doi.org/10.4324/9781003052012-16

Fritsch, J., & Latinjak, A., & Hatzigeorgiadis, A. (2021). Self-talk and emotions in sport. In M. C. Ruiz & C. Robazza (Eds.), *Feelings in sport: Theory, research, and practical implications for performance and well-being* (pp. 120–129). Routledge/Taylor & Francis Group. https://doi.org/10.4324/9781003052012-16

Galanis, E., Hatzigeorgiadis, A., Comoutos, N., Charachousi, F., & Sanchez, X. (2018). From the Lab to the Field: Effects of self-talk on task performance under distracting conditions. *The Sport Psychologist, 32*(1), 26-32. https://doi.org/10.1123/tsp.2017-0017

Hanin, Y. L. (2000). Individual Zones of Optimal Functioning (IZOF) Model: Emotion-performance relationship in sport. In Y. L. Hanin (Ed.), *Emotions in sport* (pp. 65–89). Human Kinetics.

Hanin, Y., & Hanina, M. (2009). Optimization of performance in top-level athletes: An action-focused coping approach. *International Journal of Sports Science & Coaching*, *4*(1), 47-91. https://doi.org/10.1260/1747-9541.4.1.47

Harmison, R. J. (2006). Peak performance in sport: Identifying ideal performance states and developing athletes' psychological skills. *Professional Psychology: Research and Practice*, *37*(3), 233–243. https://doi.org/10.1037/0735-7028.37.3.233

Hardy, J. (2006). Speaking clearly: A critical review of the self-talk literature. *Psychology of Sport and Exercise*, *7*(1), 81–97. https://doi.org/10.1016/j.psychsport.2005.04.002

Hardy, J., Begley, K., & Blanchfield, A. W. (2015). It's good but it's not right: Instructional self-talk and skilled performance. *Journal of Applied Sport Psychology*, *27*(2), 132–139. https://doi.org/10.1080/10413200.2014.959624

Hardy, L., Jones, G., & Gould, D. (2018). *Understanding psychological preparation for sport: Theory and practice of elite performers*. John Wiley & Sons.

Hatzigeorgiadis, A., Galanis, E., Zourbanos, N., & Theodorakis, Y. (2014). Self-talk and Competitive Sport Performance. *Journal of Applied Sport Psychology*, 26(1), 82–95. https://doi.org/10.1080/10413200.2013.790095

Hatzigeorgiadis, A., Zourbanos, N., Galanis, E., & Theodorakis, Y. (2011). Self-talk and sports performance: A meta-analysis. *Perspectives on Psychological Science*, *6*(4), 348–356. https://doi.org/10.1177/1745691611413136

Hatzigeorgiadis, A., & Zourbanos N., & Goltsios, C., & Theodorakis, Y. (2008). Investigating the functions of self-talk: The effects of motivational self-talk on self-efficacy and performance in young tennis players. *The Sport Psychologist*, *22*(4), 458-471. https://doi.org/10.1123/tsp.22.4.458

Hibbs, D. (2010). A conceptual analysis of clutch performances in competitive sports. *Journal of the Philosophy of Sport*, *37*(1), 47-59. https://doi.org/10.1080/00948705.2010.9714765

Hill, D. M., & Hemmings, B. (2015). A phenomenological exploration of coping responses associated with choking in sport. *Qualitative Research in Sport, Exercise and Health, 7*(4), 521–538. https://doi.org/10.1080/2159676X.2014.981573

Jackson, S. A., & Csikszentmihalyi, M. (1999). *Flow in sports: The keys to optimal experiences and performances*. Human Kinetics.

JASP Team (2022). JASP (Version 0.18.3) [Computer software].

Jones, M., Meijen, C., McCarthy, P. J., & Sheffield, D. (2009). A theory of challenge and threat states in athletes. *International Review of Sport and Exercise Psychology, 2*(2), 161–180. https://doi.org/10.1080/17509840902829331

Kegelaers, J., & Oudejans, R. R. D. (2024). Pressure makes diamonds? A narrative review on the application of pressure training in high-performance sports. *International Journal of Sport and Exercise Psychology*, *22*(1), 141-159. https://doi.org/10.1080/1612197X.2022.2134436

Latinjak, A. T., Morin, A., Brinthaupt, T. M., Hardy, J., Hatzigeorgiadis, A., Kendall, P. C., Neck, C., Oliver, E. J., Puchalska-Wasyl, M. M., Tovares, A. V., & Winsler, A. (2023). Self-Talk: An Interdisciplinary Review and Transdisciplinary Model. *Review of General Psychology*, *27*(4), 355-386. https://doi.org/10.1177/10892680231170263

Latinjak, A. T., Torregrossa, M., Comoutos, N., Hernando-Gimeno, C., & Ramis, Y. (2019). Goal-directed self-talk used to self-regulate in male basketball competitions. *Journal of sports sciences*, *37*(12), 1429–1433. https://doi.org/10.1080/02640414.2018.1561967

Latinjak, A. T., Zourbanos, N., López-Ros, V., & Hatzigeorgiadis, A. (2014). Goal-directed and undirected self-talk: Exploring a new perspective for the study of athletes' self-talk. *Psychology of Sport and Exercise*, *15*(5), 548–558. doi:10.1016/j.psychsport.2014.05.007

Lipponen, J. Suomen Palloliito. 2022. Jalkapallotekniikat – Koulutus: Jalkapallotekniikoiden laatutekijät, opetusvinkkejä ja videolinkkejä valmentajana kehittymiseen [Football techniques - Education: Techniques, teaching tips and video links to develop as a coach]. https://www-assets.palloliitto.fi/62562/1653401162-jalkapallotekniikat_valmis_220319.pdf

Low, W. R., Sandercock, G. R. H., Freeman, P., Winter, M. E., Butt, J., & Maynard, I. (2021). Pressure training for performance domains: A meta-analysis. *Sport, Exercise, and Performance Psychology, 10*(1), 149–163. https://doi.org/10.1037/spy0000202

Low, W. R., Stoker, M., Butt, J., & Maynard, I. (2024). Pressure training: From research to applied practice. *Journal of Sport Psychology in Action*, *15*(1), 3–18. https://doi.org/10.1080/21520704.2022.2164098

Meijen, C., Turner, M., Jones, M. V., Sheffield, D., & McCarthy, P. (2020). A theory of challenge and threat states in athletes: A revised conceptualization. *Frontiers in Psychology, 11,* Article 126. https://doi.org/10.3389/fpsyg.2020.00126

Mesagno, C., Geukes, K., & Larkin, P. (2015). Choking under pressure: A review of current debates, literature, and interventions. In S. D. Mellalieu & S. Hanton (Eds.), *Contemporary advances in sport psychology: A review* (pp. 148–174). Routledge/Taylor & Francis Group.

Moore, L. J., Wilson, M. R., Vine, S. J., Coussens, A. H. & Freeman, P. (2013). Champ or chump? Challenge and threat states during pressurized competition. *Journal of Sport & Exercise Psychology, 35*(6), 551-562. https://doi.org/10.1123/jsep.35.6.551

Nideffer, R. M., & Sagal, M. (2006). Concentration and attention control training. In J. M. Williams (Ed.), Applied sport psychology: Personal growth to peak performance (5th ed., pp. 382–403). McGraw-Hill.

Noetel, M., Ciarrochi, J., Van Zanden, B., & Lonsdale, C. (2019). Mindfulness and acceptance approaches to sporting performance enhancement: a systematic review. *International Review of Sport and Exercise Psychology, 12*(1), 139–175. https://doi.org/10.1080/1750984X.2017.1387803

Ong, N. C., & Chua, J. H. (2021). Effects of psychological interventions on competitive anxiety in sport: A meta-analysis. *Psychology of Sport and Exercise*, *52*, 101836. https://doi.org/10.1016/j.psychsport.2020.101836.

Otten M. (2009). Choking vs. clutch performance: a study of sport performance under pressure. *Journal of Sport & Exercise Psychology*, *31*(5), 583–601. https://doi.org/10.1123/jsep.31.5.583

Perkos, S., Theodorakis, Y., & Chroni, S. (2002). Enhancing performance and skill acquisition in novice basketball players with instructional self-talk. *The Sport Psychologist*, *16*(4), 368-383. Retrieved Apr 15, 2024, from https://doi.org/10.1123/tsp.16.4.368

Robazza, C., Bertollo, M., Filho, E., Hanin, Y., & Bortoli, L. (2016a). Perceived Control and Hedonic Tone Dynamics During Performance in Elite Shooters. *Research quarterly for exercise and sport*, *87*(3), 284–294. https://doi.org/10.1080/02701367.2016.1185081

Robazza, C., Bertollo, M., Ruiz, M. C., & Bortoli, L. (2016b). Measuring psychobiosocial states in sport: Initial validation of a trait measure. *PloS one*, *11*(12), e0167448. https://doi.org/10.1371/journal.pone.0167448

Ruiz, M. C., Bortoli, L., & Robazza, C. (2021a). The multi-states (MuSt) theory for emotion- and action-regulation in sports. In M. C. Ruiz & C. Robazza (Eds.), *Feelings in sport: Theory, research, and practical implications for performance and well-being* (pp. 3–17). Routledge/Taylor & Francis Group. https://doi.org/10.4324/9781003052012-2

Ruiz, M.C., & Hanin, Y. (2004) Metaphoric description and individualized emotion profiling of performance states in top karate athletes. *Journal of Applied Sport Psychology*, *16*(3), 258–273. https://doi.org/10.1080/10413200490498366

Ruiz, M. C., Luojumäki, R., Karvinen, S., Bortoli, L., & Robazza, C. (2021b). Self-regulation in high-level ice hockey players: An application of the MuSt theory. *International Journal of Environmental Research and Public Health*, *18*(24), 13317. https://doi.org/10.3390/ijerph182413317

Ruiz, M. C., Raglin, J. S., & Hanin, Y. L. (2017). The individual zones of optimal functioning (IZOF) model (1978–2014): Historical overview of its development and use. *International Journal of Sport and Exercise Psychology, 15*(1), 41–63. https://doi.org/10.1080/1612197X.2015.1041545

Ruiz, M. C., Robazza, C., Tolvanen, A., & Hanin, J. (2019). The psychobiosocial states (PBS-S) scale factor: Structure and reliability. *European Journal of Psychological Assessment*, *35*(5), 658-665. https://doi.org/10.1027/1015-5759/a000454

Sammy, N., Harris, D., & Vine, S. (2021). Challenge and threat states, and emotions. In M. C. Ruiz & C. Robazza (Eds.), *Feelings in sport: Theory, research, and practical implications for performance and well-being* (pp. 18–26). Routledge/Taylor & Francis Group. https:/doi.org/10.4324/9781003052012-2

Sarig, Y., Ruiz, M, C., Hatzigeorgiadis, A. & Tenenbaum G. (2023). The effects of instructional self- talk on quiet-eye duration and golf putting performance. *The Sport Psychologist*, *37*(3), 201–209. https://doi.org/10.1123/tsp.2023-0023

Schweickle, M., & Vella, S., & Swann, C. (2021). Exploring the "clutch" in clutch performance: A qualitative investigation of the experience of pressure in successful performance. *Psychology of Sport and Exercise, 54*, 101889, https://doi.org/10.1016/j.psychsport.2021.101889

Seery M. D. (2011). Challenge or threat? Cardiovascular indexes of resilience and vulnerability to potential stress in humans. *Neuroscience and Biobehavioral Reviews*, *35*(7), 1603–1610. https://doi.org/10.1016/j.neubiorev.2011.03.003

Swann, C., Crust, L., Jackman, P., Vella, S. A., Allen, M. S., & Keegan, R. (2017). Performing under pressure: Exploring the psychological state underlying clutch performance in sport. *Journal of Sports Sciences*, *35*(23), 2272–2280. https://doi.org/10.1080/02640414.2016.1265661

Swann, C., Keegan, R., Crust, L., & Piggott, D. (2016). Psychological states underlying excellent performance in professional golfers: "Letting it happen" vs. "making it happen". *Psychology of Sport and Exercise, 23,* 101–113. https://doi.org/10.1016/j.psychsport.2015.10.008

Tan, L. (2014). Correlational study. In W. F. Thompson (Ed.), *Music in the social and behavioral sciences: An encyclopedia* (pp. 269-271). SAGE Publications.

Theodorakis, Y., Hatzigeorgiadis, A., & Zourbanos, N. (2012). Cognitions: Self-talk and performance. In S. M. Murphy (Ed.), *The Oxford handbook of sport and performance psychology* (pp. 191–212). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199731763.013.0010

Tomaka, J., Blascovich, J., Kelsey, R. M., & Leitten, C. L. (1993). Subjective, physiological, and behavioral effects of threat and challenge appraisal. *Journal of Personality and Social Psychology, 65*(2), 248–260. https://doi.org/10.1037/0022-3514.65.2.248

van Maarseveen, M. J. J., & Oudejans, R. R. D. (2018). Motor and daze behaviors of youth basketball players taking contested and uncontested jump shots. *Frontiers in psychology*, *9*, 706. https://doi.org/10.3389/fpsyg.2018.00706

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. https://doi.org/10.1016/j.psychsport.2015.08.004

Walter, N., Nikoleizig, L., & Alfermann, D. (2019). Effects of self-talk training on competitive anxiety, self-efficacy, volitional skills, and performance: An intervention study with junior sub-elite athletes. *Sports*, *7*(6), 148. https://doi.org/10.3390/sports7060148

Weinberg, R., Miller, A., & Horn, T. (2012). The influence of a self-talk intervention on collegiate cross-country runners. *International Journal of Sport and Exercise Psychology, 10*(2), 123–134. https://doi.org/10.1080/1612197X.2012.645135

Wolch, N. J., Arthur-Cameselle, J. N., Keeler, L. A., & Suprak, D. N. (2021). The effects of a brief mindfulness intervention on basketball free-throw shooting performance under pressure. *Journal of Applied Sport Psychology, 33*(5), 510–526. https://doi.org/10.1080/10413200.2020.1720044

Wood, A. G., Barker, J. B., & Turner, M. J. (2017). Developing performance using rational emotive behavior therapy (REBT): A case study with an elite archer. *The Sport Psychologist*, *31*(1), 78-87. https://doi.org/10.1123/tsp.2015-0083

Ziegler S. G. (1987). Effects of stimulus cueing on the acquisition of groundstrokes by beginning tennis players. *Journal of Applied Behavior Analysis*, *20*(4), 405–411. https://doi.org/10.1901/jaba.1987.20-405

Table 1

Descriptive Statistics of Utility, Performance, and Effectiveness Ratings for Each Self-Talk Strategy

Strategies	Utility	Performance		Effectiveness		Lowest score	Highest score
		M	*SD*	*M*	*SD*		
Goal	8	3.8	2.3	6.3	2.1	0	7
Feeling	20	4.5	1.8	7.9	1.5	2	8
Action	18	3.9	1.4	7.3	2.2	1	6
Feeling + Action	31	4.7	1.5	7.9	1.3	1	8
Feeling + Goal	11	4.5	2.3	6.9	1.8	1	8
Action + Goal	12	3.8	1.4	7.5	2.2	1	5

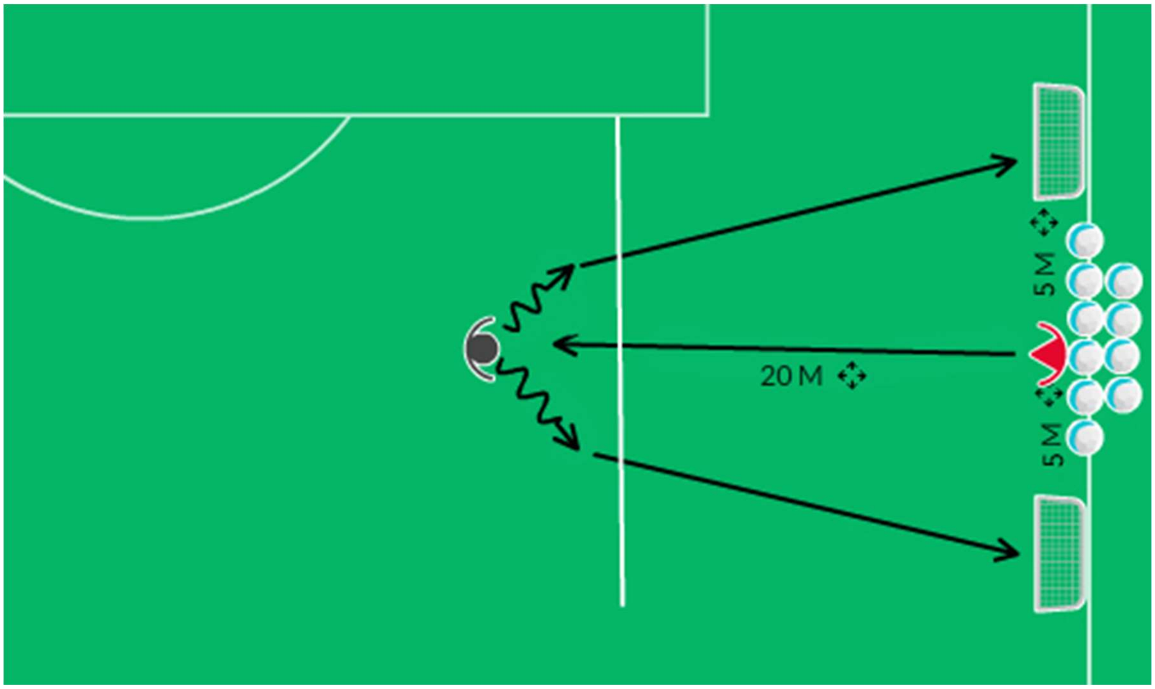

Figure 1. *Performance task passing drill*

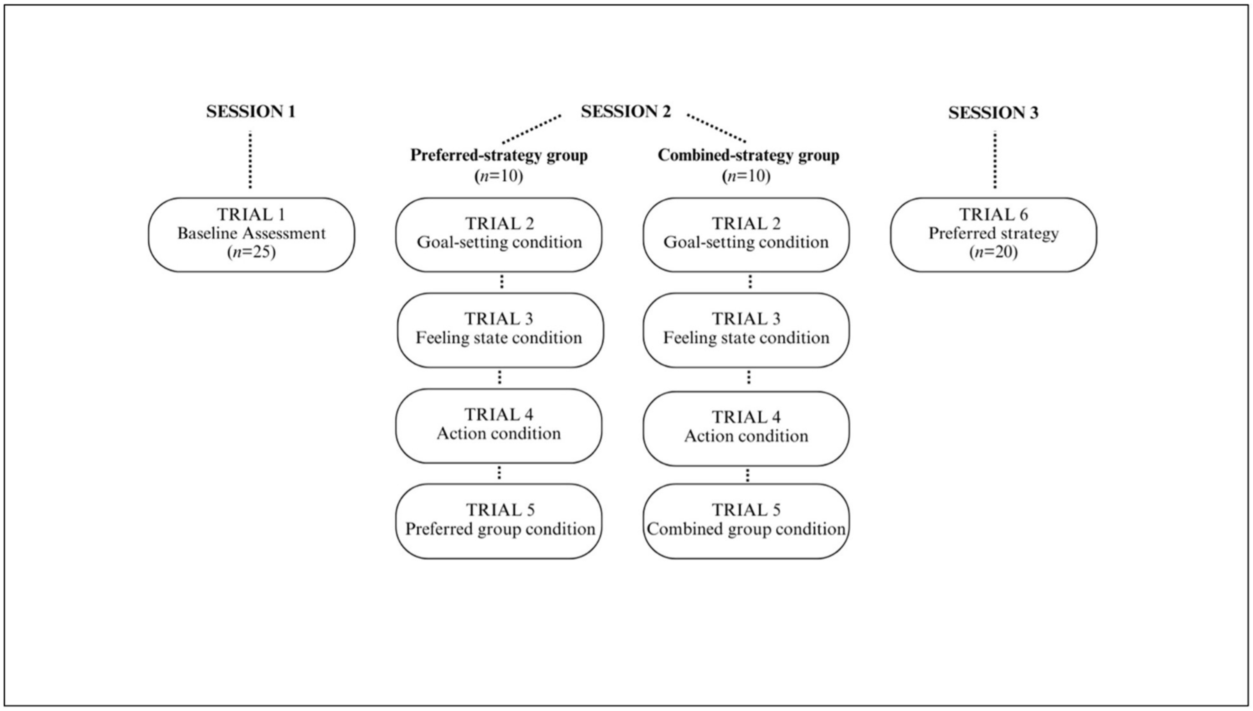

Figure 2. Flowchart of the experimental design

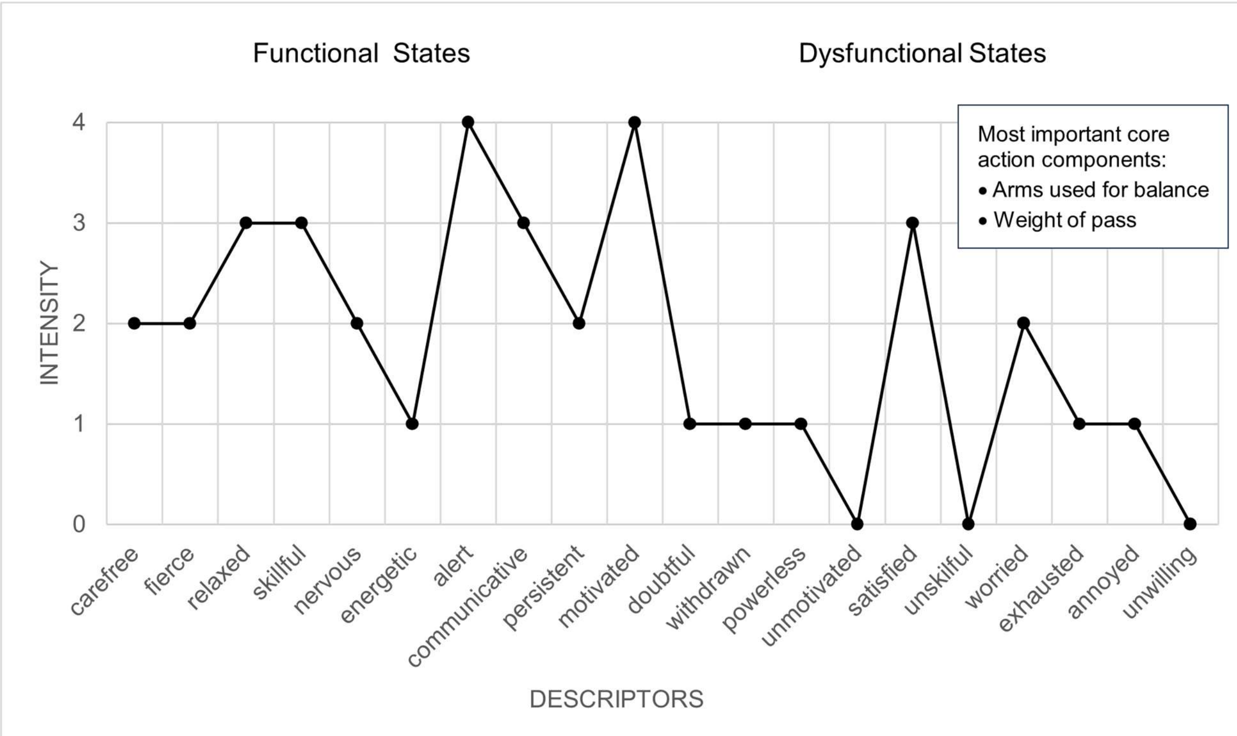

Figure 3. *Individual profile of one player's psychobiosocial feeling states and strategic cue words*

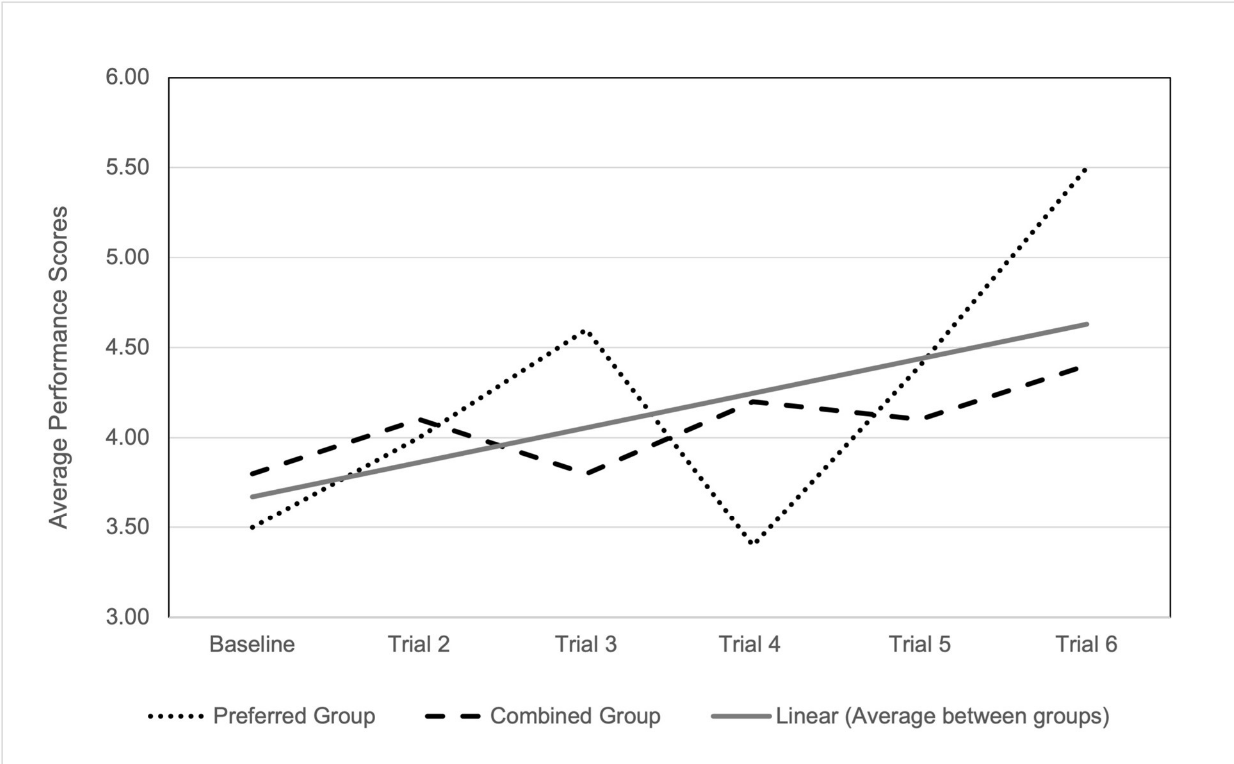

Figure 4. *Average performance scores across trials for the preferred group and combined group*