

## COMBINING PHYSICAL AND MENTAL TRAINING

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“Give your all today,” “focus on today’s workout and not the upcoming competition,” “great lift; you can do it again,” “see yourself getting stronger with each training session,” “remember the purpose of this training session,” and “when the volume of the music gets turned up, so does the effort level” are all commonplace statements within a strength and conditioning facility. Statements like those are also routine within the vernacular of sport psychology trained professionals working with coaches, teams, and individual athletes (3). Effort is a choice, and making that choice involves both a mental and physical component. Focus is clearly a mental component that has directly observable behavioral consequences. Providing positive feedback can raise self-confidence and even prompt improved athlete self-talk (28). Picturing a successful lift before it happens or seeing oneself stronger in the future are classic examples of imagery or visualization that can elevate athlete self-confidence (4). Employing music as a cue to modify athlete intensity levels has long been part of exercise and sport contexts, both within competition and training. While sport psychology has traditionally been aimed at athletes, strength and conditioning coaches can benefit both from employing some techniques themselves and having another way to help the athletes they work with maximize their potential (3).

Beyond the anecdotal experiences that clearly link the mental and physical components of movement, training, and sport, there are the copious studies that link both mental and physical components. One line of that research is the studies that have specifically examined athlete peak performances. Peak performance studies are especially noteworthy, as the key distinction of a “peak performance” is that the performance has some objective quantifiable piece that establishes it as a “peak performance,” rather than an ordinary performance (1). That is contrasted by the flow-state literature that values the intrinsic nature of the experience over the external objective results of the performance (1). This objective performance aspect is especially noteworthy in training as objective results are always available, unlike many sport or competition settings where performance data can be more convoluted. Two recent peak performance studies also clearly identify the interplay between the mental and physical components as characteristics of a peak performance (1,14). For example, Anderson and colleagues found multiple physical characteristics (e.g., physical preparation, training) and mental characteristics (e.g., self-confidence, focus) were present in peak performances (1). Harmison made an additional point that most athletes are not cognizant of when they enter into a peak performance situation and even less aware of how to physically and mentally train for a peak performance (14). It seems likely then that athletes’ performance would benefit by training both the mental and physical components simultaneously.

While the anecdotal evidence shows the two components, physical and mental, are already being utilized simultaneously, it is rare to find the two components systematically being trained together.

Some mental and physical combination training programs have been developed for individual sports, but that has not been extensively studied or applied to a strength and conditioning facility (5). The simplest explanation for that is a lack of training, personnel, and resources. Sport psychology trained practitioners rarely have access to physical training facilities and even more rarely do they have adequate strength and conditioning education, certification, and experiences. Similarly, strength and conditioning coaches have the facility access and physical development areas covered, but often lack an understanding and training of mental tools and skills. Additionally, there are vastly more strength and conditioning coaches employed by schools, organizations, clubs, and teams than there are sport psychology trained professionals, as sport psychology is still a relatively young field (23). Given those parameters, it seems strength and conditioning coaches are well positioned to improve the performance of their athletes by systematically training both the mental and physical components. This article will explore how those two pieces can be paired to enhance athletic performance.

### PLANNING A TRAINING PROGRAM

The concept of periodization is commonplace within strength and conditioning (11). Program variables, such as duration of a micro- or meso-cycle, change considerably given context specific details (11). However, the nature of a periodized program is that the exercises, intensity, and volume will fluctuate throughout the course of a season or a year. More acute program variables, such as exercise selection, load, and volume are manipulated to target the various training phases. There are clearly defined off-season and in-season portions and the training variables are modified to reflect those competition demands (11). Guidelines for what to prioritize at a certain time can be established and experienced strength and conditioning coaches can build up a formidable library of training programs in an attempt to yield the best results.

The periodization-specific research is rather limited in the sport psychology literature with one notable exception and even that exception was a theoretical application of periodization techniques to mental skills training (16). Those authors specifically borrowed the term “periodization” from the physical training literature and paired it with long-standing traditions within the sport psychology literature (16). For example, they argued that the best time to teach new activities targeting a mental skill is the off-season, which is entirely congruent with the physical training literature (16). There are some notable differences, with the greatest probably being training volume throughout a season. Physical training volume would rarely increase throughout a season, whereas mental training often increases, or at least increases through a later point in the season more so than physical training (16). That specific distinction between the two though would seem to be complementary more than divisionary. In reality, as physical training volume diminishes, mental training volume can increase without adding more total training time to the individual athlete’s schedule.

Examining the calendar is one of the first steps toward writing either a physical or mental training program (16). Identifying season beginning and ending dates, major competitions, any significant training barriers, and how much time athletes can actually devote to training are all significant tasks when building a training program. Establishing broad-based training objectives is a logical second step for both paradigms of training. An off-season strength phase often makes sense to build a base or to lead into a power development phase in the next meso-cycle. Similarly, a systematic goal-setting program may be instituted within the first meso-cycle of a mental training program to increase effort in training, thereby focusing on the tasks the athletes have control over at a time during the year when the next competition may be months away (18). There is no single perfect first meso-cycle training objective in either the physical or mental training paradigms, and strength and conditioning coaches often rely on their own past experiences to guide initial program development. In both physical and mental training contexts, there is an argument to be made for starting with athlete deficiencies, just as well as starting with athlete strengths and the most appropriate decision depends on specific contextual variables that prevent any broad-based declarations within this article. Specific decisions need to be made in accordance with local contextual variables that are inclusive of athletes, coaches, and facilities. For example, an athlete that is having difficulty maintaining motivation may benefit more from working on tasks where success is more likely, thus realizing the short-term resultant increases in self-confidence that would be expected from the mastery experiences (24).

## PUTTING THE PIECES TOGETHER

The following series of examples should be viewed as possibilities. While each physical training program was provided by a full-time strength and conditioning coach that was used in the actual training of National Collegiate Athletic Association (NCAA) scholarship athletes, the specific programs were designed based on specific local variables that may or may not make them viable as a “plug-and-play” option for different contexts. Fully describing those context-specific variables is outside the scope of this article. For the mental training components, there are also many viable training options, patterns, and progressions. The mental training options provided include goal setting, imagery, self-talk, and attribution training. Table 1 shows highlighted portions for all of the following examples and contains information on both the physical and mental training programs.

### EXAMPLE 1

**Context:** Off-season football program for offensive and defensive linemen. This was the first meso-cycle of the training calendar. Spring ball competitions were months away.

**Physical:** The first meso-cycle included a strength-based physical development component lasting for eight weeks. The lifting program included exercises for the whole body, three days a week, and primarily focused on multi-joint exercises with some supplementary exercises. Load percentages peaked on training day two of the week, while day one was higher than day three in each of the weeks.

TABLE 1. SAMPLE PLANNING WORKSHEET FOR COMBINED MENTAL AND PHYSICAL TRAINING PROGRAMS

SPORT AND SEASON	CYCLE	MONTH	PHYSICAL OBJECTIVE	RESISTANCE TRAINING (FREQUENCY AND TYPE)	SETS X REPETITIONS X PERCENTAGE OF EFFORT	MENTAL SKILL
Football, Off-Season	Meso-1	January and February	Strength	3x / week	3-5 x 6-8 x >70%	Goal Setting
Football, Off-Season	Meso-2	March	Speed	3x / week	3 x 3-6 x 55-70%	Imagery
Baseball, In-Season	Meso-1, 2, 3	April, May, and June	Strength/Maintenance	3x / week	3 x 2-5 x 60-70%	Self-Talk
Tennis, Off-Season	Meso-1	September and October	Endurance	1x / week	3-4 x 8-15 x < 60%	Attributions/Personal Control

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**Mental:** From the mental side of the equation, this was an ideal time to institute any new training protocols or systems that the coaching staff believed to be useful throughout the season. At this early point in the off-season, some athletes may have trouble connecting the training they are doing to competitions several months away. This poor connection made motivation a reasonable mental skill to begin to develop. When athletes first return to training, there is typically a bit of excitement in the air on both the part of the athletes and coaching staff. A little time away is known to reduce burnout and that makes for an ideal situation to introduce something new when the athletes first return (7). Instituting a systematic goal-setting program would be a way to capitalize on the athletes' rejuvenation while putting a system in place that can exist for the duration of the off-season and into the competitive season. Additionally, goal setting has been shown to increase persistence and effort in athletes, which should help with the athletes' motivation levels throughout the season (19).

A challenge with any goal-setting program is that it requires a systematic implementation, and that typically means an investment of time on the part of the coaching staff (8,10,25). After the initial investment, the goal-setting program should not require as much time as other mental tools, which is another reason why implementing goal setting at this point in the yearly training cycle may be most beneficial. To successfully implement goal setting, first, the strength and conditioning coach must learn enough about goal setting to follow guidelines to maximize the chances of seeing positive outcomes. Second, the coaching staff must find a way to get some level of buy-in from the athletes and teach and explain the goal-setting process to the athletes. Finally, the coaching staff must be willing to stick with the plan initially laid out for the goal-setting intervention.

Each of those steps has potential pitfalls (10). A well-designed goal-setting program should be adaptable, just like a good physical training program, but the framework and mere existence of the goal-setting program should not disappear. Much in the same way that a five-week strength program should not be tossed out after only two weeks if the athletes complain the loads are too heavy, the goal-setting program should not be tossed out after only two weeks if the athletes complain about it. There are additional resources available to help the coaching staff develop a goal-setting program and even one specifically targeting strength and conditioning coaches (8,10,25). The suggestion here is to be sure some resources specific to goal setting are consulted because there are specific guidelines available that will greatly improve the effectiveness of the goal-setting program.

### EXAMPLE 2

**Context:** Off-season football program for the offensive and defensive linemen. This was the second meso-cycle of the year. Spring practice was five weeks away and competitions were months away.

**Physical:** This can be viewed as a continuation from the first example. Here in this second cycle, the focus shifted to speed development. This is consistent with training guidelines where a solid foundation of strength is developed prior to moving on to more power-focused movements (11). This program was designed to last for five weeks with two training days each week. Load percentages were reduced in comparison to the strength phase, but loads did increase on day two each week, along with an increase over the duration of the program. Loads hit their highest percentages in week four of the program with a one-week taper in week five so that the athletes were more ready when spring on-field practices begin.

**Mental:** Imagery is about using the mind's eye to see actions before they happen. Imagery has been frequently studied with adult and elite level athletes (20). A check-list of sorts for components that are ideally present within an image is the PETLEP model: (a) Physical: the actual movements to be imaged; (b) Environment: as many contextual variables from the senses as can be included; (c) Task: a specific and detailed example of the movement being imaged; (d) Timing: maintaining an appropriate duration for the image in comparison to the actual skill being executed; (e) Learning: ensuring that the content of the image and the pieces of the movement imagined are actually correct; (f) Emotion: some degree of inclusion of how the athlete would feel in the moment of executing the movement; and (g) Perspective: the viewpoint, first or third person, of the image (17). The presence of timing as one of the key components to imagined experiences makes a natural connection to a physical program focused on power. Speed, power, and quickness seem to have a visual component to their execution in that observers can readily see someone that is fast in sport competitions without the observer having much training or knowledge about training or even sport in general. Using imagery to help athletes transition from a strength phase to a power phase may also help the athletes with their lifting technique by instilling an explosive mindset in preparation for the explosive lifts in the workout.

A critical component to the success of imagined experiences is using all the senses (17). This may present a challenge to the strength and conditioning staff, as strength and conditioning coaches often get so accustomed to their environment, they may no longer notice all that is around them. Without noticing what is in the environment, it is that much more difficult to teach the athletes to image with all their senses. One example is the music played in the facility. The coaching staff hears this music for many hours a day and begins to block it out; whereas, the athletes only hear it for the hour or so that they are training. A second example is the rough tactile feeling on most bars. Strength and conditioning coaches, and veteran lifters of any type, often fail to notice how rough some bars actually feel. Years of callous buildup and thousands of repetitions block out the feeling. These examples could be problematic for the strength and conditioning coach when teaching or implementing an imagery program

on two levels. First, the strength and conditioning coach has to actively notice the sensory experiences the athletes will be experiencing in order to point them out to the athletes so they can be incorporated into the image the athletes build. Additionally, the loud noises may prompt an involuntary attention response from athletes working on their imagery skills while inside the training facility that pulls the athletes from their images. That is to be expected, but it does add another layer to the complexity of instituting an imagery training program within the training facility.

### EXAMPLE 3

**Context:** In-season baseball athletes. Each weekend typically had multiple competitions while few competitions were played during the week. The competitive season lasted for approximately 12 weeks.

**Physical:** The physical training program was designed to last for the entire duration of the competitive season and to have three training days each week. This 12-week program was divided into three four-week meso-cycles and each week-long micro-cycle emphasized a different acute training variable (e.g., elongating the eccentric cycle and emphasizing an isometric hold at both ends of a repetition). The first meso-cycle had higher volume than the subsequent cycles. For both the first and third meso-cycles, the highest volume days were days one and three of the week, with the second meso-cycle showing the peak on the second training day of each week.

**Mental:** There is substantial downtime during baseball games and practices. This downtime presents ample opportunities for athletes' minds to wander to task-irrelevant or counter-productive thoughts, and the first step to improving the negative thoughts is to be aware that they even exist (13). Two recommended techniques to increase awareness of negative self-talk is the use of log books (i.e., recording the content of and when negative thoughts occur) and what is termed a "paperclip technique" (13). For the paperclip technique, some set number of small items (e.g., paperclips or sunflower seeds) is placed in one pocket and at each occurrence of a negative thought one of the paperclips is removed from the initial pocket and placed in a different pocket, allowing for a total number of negative thoughts to be counted. Improving the athletes' self-talk is one way to combat those problematic thoughts, as well as helping to cope with the demands of playing the sport (13). Self-talk can directly influence self-confidence (15). One complicating factor with regards to self-talk is that there is an important distinction between frequency of self-talk and the perceived effectiveness of what the athlete says and thinks (2). For example, an athlete that consistently (i.e., high frequency) says "I am terrible at cleans," does not necessarily believe (i.e., low effectiveness) he or she is actually terrible at cleans. The statement could simply be a defense mechanism, or it could be a socially ingrained (i.e., most other athletes are, or have, said something similar) statement.

Because self-talk should be individualized, it is ill-advised to use a team-wide or blanket approach. Athletes tend to prefer individualized mental skill interventions, which may require a bit more time on the strength and conditioning staff's part to get each athlete pointed in the right direction (27). This is one intervention where working with a qualified sport psychology consultant may be the best way to move forward. Nonetheless, self-talk is a highly flexible mental tool. Some baseball athletes may benefit most if they work on self-talk that helps to transition from one phase of the game to the next (e.g., leaving a bad at-bat in the dugout and not taking it out on the defensive field). A quick self-talk script focusing on responsibilities specific to the situation at-hand may help with that by highlighting the athlete's current defensive role or stating the situation (e.g., number of outs recorded and baserunners) and thus, not allowing the athlete to dwell on the previous failed at-bat. During training, the same principle applies and scripts can focus on a specific technique portion on one lift (e.g., landing position on a clean) that does not apply to another lift (e.g., incline barbell press). Self-talk scripts could also be used to improve coping skills after a failed attempt. In baseball, this could be after a poor plate appearance or after committing a fielding error. In the training facility, this could be unsuccessfully completing the prescribed sets or repetitions, or it could be a technique flaw in executing a lift that a strength and conditioning coach pointed out.

A final note on the pairing of self-talk with this specific training program is that as the micro-cycle objectives change each week, the particular focus of the self-talk could also change. The first week of each meso-cycle could be positive affirmation statements designed to increase self-confidence. The second week's pairing could be more related to coping mechanisms. The third week could focus greater attention to the task at-hand and blocking out irrelevant stimuli. Finally, the fourth week of each meso-cycle could simply target energization or increasing arousal to execute the lift properly.

### EXAMPLE 4

**Context:** Women's tennis in the return to training after the summer vacation that coincided with the start of the fall academic semester. The head tennis coach requested no more than one day of resistance training.

**Physical:** It can be a challenge when working with some sport coaches that dictate what training options are available and this program was an example of that. With only one day of training, the workout must be a total body one. The first eight-week meso-cycle was split evenly into two four-week cycles. Volume was higher in the first cycle. In terms of exercise selection, the specific lifts did change from the first to the second meso-cycle, but the changes were simple variations of the same basic movement more so than wholesale changes. Making any change at all was probably not necessary for further training adaptations, yet the

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adjustments were made to prevent boredom in the athletes, as well as targeting slightly different muscles.

**Mental:** With the athletes only coming into the training facility one day a week, the strength and conditioning coach's opportunity to effect positive change was reduced. To counteract that, the strength and conditioning coach may elect to focus on topics beyond traditional training when interacting with these tennis athletes. One option is to help the athletes through attribution training. At its most basic level, attributions are the reasons people give for why something happened. While there are variations to the model, the longest lasting simple description is a two by two framework: internal versus external; stable versus unstable (26). Internal and external refer to whether the athlete believes he or she had control over the situation. Stable and unstable is a descriptor of whether or not the athlete believes similar circumstances in the future will lead to a similar outcome (i.e., stable) or a different outcome (i.e., unstable). Attribution retraining has been shown to help athlete performance (21,22). Specifically, the coaching staff can use attribution training to remind the athletes of what they can control and what they cannot control. One aspect the athletes can largely control is their eating habits. With only one day of training, nutrition will play a more important role for two reasons. First, the training day needs to be productive and that just cannot happen without enough fuel for the athletes to burn to give full effort. Secondly, without the more common multiple training days a week routine, these athletes will likely be getting less exercise and movement overall, which highlights the need to avoid excess caloric consumption throughout the week.

Sleep is also an important factor to determining performance and one that is largely controllable by the athlete. The return of an academic semester means other scheduling changes and requirements on the athletes' time in comparison to the past few months of summer. Teaching athletes to focus on what they can control has been shown to be one of the strongest uses for attribution training (12). When athletes have limited contact with the coaching staff, the strength and conditioning coaches may need to be more creative with how they can influence athlete performance, and reminding athletes of how these other areas that they have control over may yield positive performance gains.

While attribution retraining is not typically described as one of the traditional mental tools (e.g., goal setting, imagery, self-talk) and might seem overwhelming for a strength and conditioning coach who is new to it, it can be a powerful tool in the strength and conditioning coach's repertoire. When training is limited to a single day of the week, the athlete's activities away from the facility play an even greater role. This should be seen as an opportunity for the coaching staff to help athletes develop sound patterns around nutrition, sleep, and academic behaviors that will yield benefits throughout the year. To put that opportunity to maximum benefit, coach comments and feedback to the athletes should

emphasize an internal (i.e., within their control) and unstable (i.e., changeable) approach to their sport and academic responsibilities. "Just going to study tables is not enough, you need to be quizzing yourself on the material too to be actively involved." "That pizza did not just jump onto your lunch tray by itself. Make sure you get some fruits and vegetables on there too." "Sleep does not really count if your cell phone keeps dinging all night long. Have you tried turning the notifications off at night?" There has been a recent article on how strength and conditioning coaches can better help their athletes through establishing improved attribution patterns that can provide additional examples (9).

### CONCLUSION

The above examples are merely one possible combination or path toward helping athletes maximize their potential. With regards to the mental training components, it is important to realize they all build to additional topics in mental training and there are numerous ways these topics could be combined. For example, using goals that are self-referenced (e.g., an athlete's current performance compared to his or her own previous performance) are likely to help that athlete develop a task-oriented achievement approach. This is congruent with the construct of a growth mindset (6). Alternatively, goal setting could focus on team accomplishments (e.g., setting a total position group goal for kilograms lifted in a workout) which would then impact team cohesion and address the basic psychological need of relatedness (24). That same goal-setting program can allow athletes the opportunity to demonstrate competence, which is another basic psychological need. The third basic psychological need, autonomy, can also be achieved by having the athletes participate in the goal-setting process. Those three psychological needs are key ingredients to fostering intrinsically motivated athletes (24). If a strength and conditioning coach is working with more intrinsically motivated athletes, that will free up some time to build stronger relationships with the coaching staff, or just to pursue additional professional development activities.

Much in the same way that a single movement or a single workout does not make or break a training cycle, the same holds true for mental skills. This is perhaps the single strongest link between mental and physical training. Results rarely arrive without the prerequisite work being put in to earn those results. "Getting bigger, faster, and stronger" in this way is roughly equivalent to "getting more focused, confident, and resilient." All six of those descriptors can be accurate, but they come only after the necessary movements, exercises, and activities have been developed to the point of improvement. The basic intent of using a periodized physical training program is to accomplish many different objectives over the course of a season and while peaking at the appropriate time, and all of that according to a purposeful systematic plan. The same can be true for the mental skills. The challenge is that the strength and conditioning coach will likely need to reach out to another professional trained in sport psychology to help establish the plan and construct

the appropriate interventions. If the ultimate goal is improved athlete performance, then both the coaching staff and the sport psychology consultant should set their own egos aside to better help the athletes.

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**Conflicts of Interest and Source of Funding:** The authors report no conflicts of interest and no source of funding.

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