What is Specificity? Why it’s so misunderstood
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I personally believe this is such a misunderstood term, the principle of specificity is one of the least well-understood concepts in strength and conditioning or by coaches in many sports.

Broadly speaking, the principle of specificity states that any training conducted by an athlete should be specific to their sport. This maxim should be interpreted in a general sense. All sports require an athlete to have a number of qualities to be successful (for example, skill, speed or strength).

Therefore, any activity that improves a quality that is necessary for a given sport is specific to that sport.

Where the confusion lies, is in the fact that the term sport-specific is sometimes interpreted too narrowly. For example, some coaches may advocate training that replicates a particular movement pattern evidenced in their sport, only use training modes that emphasize the prevalent energy systems in a sport or utilize training philosophies that mirror those of the sport. Of course, this approach is not inherently flawed – the fault lies when training is restricted only to activities defined by such a narrow definition of sports specificity.

No matter what approach a strength and conditioning coach takes to training his or her athletes, ultimately the defining philosophy of his or her system is that it is impossible (or at least not efficient) to get in the best possible shape for a sport simply by participating in that sport.

If this was not the case then strength and conditioning would be obsolete and athletes would train solely in their sport. Generally, after an athlete has reached a certain level of cardiovascular fitness, strength, speed, etc., by playing their sport they cannot make further improvements simply through continued participation in their sport. Instead to make further gains they need to seek other training modalities that allow them to further challenge their physiological system and hence make continued improvements. This is analogous to the principle of progressive overload.

It is important, therefore, to distinguish between playing and practicing sport skills and strength and conditioning training for a sport. In the former, an athlete is concerned with improving their skill base and becoming better able to use their physical attributes in the competitive environment. In the latter, an athlete is focused on developing their physical attributes in order to be a more commanding physical presence when competing. This distinction is important. The weight room (or track, etc.) is not an appropriate place to develop specific sporting skill, and if an athlete needs to improve in this area this should be achieved through increased skill practice. In fact, later we will explore why training activities should not be too movement pattern specific. Instead the weight room should be used for developing physical qualities and general movement skills (Chiu, 2005).

Modern training in sport is generally structured around a periodised plan. Periodisation is the planned progression of an athlete through a series of training cycles with different aims leading to a planned peak in performance at some point in the competitive season (Baechle and Earle, 2000). Classically a periodised plan begins with a period of high volume, low intensity training, and over the course of the season volume is reduced and intensity increased (Baechle and Earle, 2000). The amount of technical practice increases commensurately with the increased intensity. Another way to characterize a periodised plan is by considering it as three phases: a period of general training, a period of specific training and then the competitive season (Yessis, 1982). It is important to note
that the success of any periodised plan is, therefore, built upon a foundation of general physical preparedness (GPP). Thus in order to reap the benefits of more specific conditioning and increased technical practice the athlete must first be physically prepared in a general way (with regards to the qualities that are important for success in their sport). If we extend this model to a long-term athlete development plan we can infer that before an athlete can benefit from specific training, they must first become a well-conditioned athlete (Chiu, 2005).

An example of this is the employment of plyometric training in athletics. Particularly in the current off-season in Europe, many coaches use these more specific tools for the development of explosive power early in the periodised plan before a period of structured strength training.

This exposes the athlete to an unnecessary injury risk, as they may not be strong enough to withstand the forces developed. From a performance perspective, plyometrics are most effective when an athlete has developed some strength capabilities, and plyometrics are used to transfer this strength into power. Equally, plyometrics are often used too early in an athlete’s long-term development. The NSCA recommends that an athlete should be strong (i.e. generally physically prepared) enough to back squat one and a half times their body weight before commencing a plyometric training programme (Baechle and Earle, 2000).

Thus when we consider sport specific training we must first ask ourselves what general qualities are specific to that sport and to what extent has the athlete trained and developed these qualities?

In many cases this type of analysis will reveal that the most specific training that that athlete can then do is to train for the improvement of some very general qualities.

We have already defined sport specific training as being focused upon improving the qualities that an athlete needs on the field. In the selection of appropriate training activities we must be careful to ensure that the stimulus prompts adaptations that improve performance on the field. This is the concept of transfer of training. The degree to which a training modality transfers is hard to evaluate, with the gold standard being validation of training protocols in peer reviewed research. For example, there is an abundance of literature that demonstrates that strength training with free weights results in adaptations that transfer to a wealth of sports (Fatouros et al., 2000; Newton and McEvoy, 1994). Not all training modalities have been shown to be as effective, however. For example, preliminary research suggests that some types of core stability training may not be performance enhancing (Tse et al., 2005). Similarly, we need to guard against making intuitive (and possibly erroneous) judgements.

For example, does an increase in balance skill on a Swiss ball, really translate to improved balance on the rugby field. Balance skills may not be transferable generally, and in this case there are differences between Swiss ball activity (where the supporting surface moves) and rugby (where the ground stays still and everything else moves) (Willardson, 2004).

In the selection of appropriate training activities we also need to consider the effectiveness of a training modality. For example, if a rower is training for pressing strength, is a flat bench press or Swiss ball dumbbell bench press more appropriate? Although both activities will increase pressing power the flat bench press will allow the athlete to handle a greater load and thus increase pressing power more efficiently. One might argue that the Swiss ball version will improve that athlete’s balance, but a) will this transfer to the water, and b) is this gain worth the sacrifice of greater strength improvements (Willardson, 2004).

In choosing training activities we also need to appreciate the potential for a negative transfer of training. A negative transfer describes a reduction in sporting performance due to sport specific training. For example, a cricketer who practices bowling with weighted balls in order to improve their “throwing specific strength” may become less accurate – with a consequent decrease in performance. A negative transfer can often arise when a training movement pattern is too similar to the sporting skill. In this case a “pattern confusion” arises – the two motor patterns are too similar and the body’s ability to perform the original skill is diminished (Mount, 1996). For this reason it is often useful to choose training activities that are different to the sporting skill. Remember, we train for sporting skill on the field, and use the weight room to improve general skills and physical properties.
Selecting training activities that are different to the sporting skill also introduces variety to the programme. Variety in training is vital in terms of making continuing improvements and preventing overtraining (Yessis, 1981). One of the pitfalls of narrowly defined sport specific training is that the programme becomes based upon improving only one or two components of fitness and this compromises potential gains. For example, if muscular endurance is important to your sport (for example in rowing) a narrow definition of sport specific training might restrict your work in the weight room to specific muscular endurance training. However, there is a strong correlation between maximal strength and muscular endurance (Zatsiorsky, 1995), therefore, muscular endurance can also be improved with maximal strength training. The most efficient training programme may therefore include both of these facets of strength training.

When considering specific training it is, therefore, important to have a broad frame of reference and take an holistic view of a training programme. Fitness qualities should not be viewed in isolation. For instance, increased strength may improve an athlete’s agility, aerobic training may allow an athlete to reap better returns on their strength training and flexibility training may improve an athlete’s power. Most athletes would benefit from becoming more generally athletic.

Not only will this improve their quality of life, but improvements in overall athletic ability generally transfer well to the sporting context.

A broad philosophy of training may encompass many topics and considerations. For example, the best injury prevention strategy may involve exercises that from a performance perspective cannot be considered to be specific at all. However, being healthy and able to train and compete is clearly the paramount concern of any training programme. The more specifically an athlete is training the more important general training becomes. If an elite rower was to train purely specifically (in the narrow sense of the word) they may only engage in pulling activities. This would result in imbalances in muscular strength across joints due to the pulling musculature being relatively more developed than the pressing musculature.

Finally, in evaluating how specific an exercise or training modality is to a given sport there are a number of considerations. It is common for activities to be considered specific to a sport based purely upon kinematic (i.e. movement) considerations. In evaluating similarities certainly this is one consideration. However, we also need to consider the kinetics (i.e. force, energy and power) of a movement (Chiu, 2005). Similarly, we may need to consider the metabolic or hormonal demands of an activity, the mechanical specificity or the joint angles at which forces are developed (Stone, 1982). A detailed evaluation of the similarities between activities is generally quite involved (e.g. Garhammer and Gregor, 1992).

When designing a sport specific training programme it is important to guard against being too specific. The best method of training is not simply to overload the particular movement patterns involved in a sport. If the best way of training an athlete were to replicate their sport in the weight room, then the most efficient training would be to simply participate in their sport. If this were the case, there would be no need for strength and conditioning coaches.

Reference:


